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❖ SPORT AND PERFORMANCE

THE ASSESMENT OF THE FAİLURE AND SUCCESS CASES OF THE SPORTMEN PARTICIPATING TO MUAI-THAI TURKEY CHAMPIONSHIP

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Abstract

Objective: This research is made to determine the factors which affect the succsess and failure of the sportsmen competing at elite level in the branch of Muay-Thai in Turkey championship.The universe of the research involves Muay-Thai sportsmen at elite level and participating to Turkey Championship.The sampling group is constitued by 80 successful and 80 unsuccessful sportsmen in Turkey Championship.

Method: In the research, a survey has been made to determine the factors affecting sportsmen's success and failure and by intervieving face to face with sportsmen participating to competition, datas have been collected.The findings have been analyzed stastically by using frequency method.

Discussions and Conclusion: After the research which has been made to determine the factors affecting the success and failure of sportsmen participating to Muay-Thai Turkey Championship, has been carried out, it can be conclued that while many factors are well to the fare in successful sportsmen, in failed sportsmen motivation, stress, regular training and lack of strategy are well to the fare.

Key words: Success, Failure, Muai-Thai, Sports.

Introduction

The Far-Eastern sports are made to gain physical fitness, defense and mental discipline.(N. Merrilee, M. A. Zetaruk, D.Z. Violan, J. M. Lyle, 2000; J. C. Cox, 1993, S. Savaş, A. Uğraş, 2004). Muai-Thai is a type of martial arts of Thailand which allows boxing, kicking, using of knee and elbow. It is a branch of sports which provides physical and mental evolution and emphasizes discipline and respect momentously (C. Boykin, 2002, S. Gartland, M.H.A. Malik and M. E. Lovell, 2001).

The concept of success is approached in terms of two aspects. In the first one, it is evaluated according to that a sportsman's fulfilling a movement function.In the second one, success shows the result of this sports activity (C. İkizler, 1994). Motivation is defined as mechanisms which direct organism to behavior, determine the regularity and permanence of these behaviours and provide various interior and exterior factors determinig and giving aim to behaviour and working of these factors (A. Aydın, 2001).

One of the factors affecting the success of the sportman is the trainer.The trainer makes private practices to make the sportsman successful and to have the sportsman gain factors like motivation and necessary personality features. However a sportsman is capable and he practices, he needs help of trainer to win (E. Başer, 1998). The aim of this study is to determine the factors affecting the success and failure of the sportsmen participating to Turkey Championship in the branch of Muai-Thai.

Material and Method

The aim of the research is to determine the factors affecting the success and failure of elite sportsmen competing at Muai-Thai Turkey Championship in Antalya. The system of the research involves sportsmen who participate to Turkey Championship and compete at Muai Thai at an elite level. The sampling group is constitued by 80 successful and 80 unsuccessful sportsmen in Turkey Championship.

Datas have been collected to achieve the goal of the research in two ways. Firtsly, the literatur related to the subject has been scanned and then a survey has been made to determine the factors affecting the success and failure sportsmen for the aim of the research. Datas have been collected by interviewing face to face with sportsmen participating to the competition and by defining 24 survey questions one by one under a headline which have been measured in SPSS programme, answer chics to each defined question have been coded numerically.After all the question forms have been enrolled to the SPSS programme, by taking frequencies and percentages of each question, table documentaries have been developed.

Table 1: The interior and exterior factors affecting the success of subjects participating to the research

Variables	Yes		No		Partially	
	N	%	N	%	N	%
The effect of strength	27	33,8	47	58,8	6	7,6
The effect of resistance	25	31,3	48	60,0	7	8,8
The effect of flexibility	22	27,5	47	58,8	11	13,8
The effect of motivation	56	70,0	20	25,0	4	5,0
The effect of stress	50	62,5	24	30,0	6	7,5
The effect of trainer	18	22,5	61	76,3	1	1,3
The effect of family	11	13,8	65	81,3	4	5,0
The effect of balanced diet	19	23,8	47	58,8	14	17,5
The effect of climate	16	20,0	57	71,3	7	8,8
The effect of saloon	16	20,0	59	73,8	5	6,3
The effect of practicing regularly	44	55,0	28	35,0	8	10,0
The effect of the place they are practicing	18	22,5	57	71,3	5	6,3
The effect of materials they are using	23	28,8	48	60,0	9	11,3
The effect of technique dominance	33	41,3	37	46,3	10	12,5
The effect of tactic dominance	37	46,3	31	38,8	12	15,0
The effect of being coordinated better than rival	34	42,5	36	45,0	10	12,5
The effect of being well of their conditions	40	50,0	33	41,3	7	8,8
The effect of competition referees	25	31,3	45	56,3	10	12,5

Table 2: The interior and exterior factors affecting failure of the subjects participating to the research

Variables	Yes		No		Partially	
	N	%	N	%	N	%
The effect of strength	68	85,0	5	6,3	7	8,8
The effect of resistance	75	93,8	3	3,8	2	2,5
The effect of flexibility	69	86,3	5	6,3	6	7,5
The effect of motivation	72	90,0	2	2,5	6	7,5
The effect of stress	35	43,8	31	38,8	13	16,3
The effect of the trainer	75	93,8	3	3,8	2	2,5
The effect of the family	50	62,5	20	25,0	10	12,5
The effect of balanced diet	52	65,0	17	21,3	11	13,8
The effect of climate	22	27,5	49	61,3	9	11,3
The effect of saloon	41	51,3	31	38,8	8	10,0
The effect of practicing regularly	72	90,0	7	8,8	1	1,3
The effect of the place they are practicing	70	87,5	6	7,5	4	5,0
The effect of materials they are using	51	63,8	21	26,3	8	10,0
The effect of technique dominance	70	87,5	3	3,8	7	8,8
The effect of tactic dominance	74	92,5	2	2,5	4	5,0
The effect of being coordinated better than rival	73	91,3	1	1,3	6	7,5
The effect of being well of their conditions	70	87,5	6	7,5	4	5,0
The effect of the competition referees	18	22,5	53	66,3	9	11,3

Discussion

There have been an intense stress and anxiety on sportsmen in competition period.If they can not be controlled, they can affect success and performance of the sportsmen negatively and they can cause failure (V. Yılmaz, Z. Korunç, 2004). Essentially, to prevent the factor of failure which is a negative result for sportsman and trainer, the factors causinf failure should be determined.

Therefore; in the study to determine the factors affecting success and failure of sportsmen participating to Muai Thai Adults Turkey Championship, the factors like strength, resistance, flexibility, family, climateireferee, practicing regularly the place they are practicing,technique dominance,tactic dominance, being coordinated better than rival,physical fitness, diet, saloon and materials are assessed individually on 80 successful and 80 unsuccessful sportsmen. At the result of the assessment, it can be seen that while in the success of the successful sportsmen,many factors are well to the fore, in the failure of unsuccessful sportsmen, only motivation, stress, lack of regular practice and lack of tactic are well to the fore.

According to Akandere (2000), this negative effect of motivation and stress on sportsmen shows parallellism with the study of M.C. CUE (1984) named as "stress in junior mecal students, relationship to personality and performance" (M. Akandere, 2000, M.C. Cue, 1984). Gümüş and his friends (2006) have cited that in their study named as "Examination of Instant Anxiety Level according to Score Sequence in Professional Football Teams", at the result of subjective assessment of sportsman, the perception of possible failure is certainly followed by anxiety reaction (M. Gümüş, I.T. Ulusoy, F. Yamaner, T.C. Akalın, 2006).

In the study of Yılmaz and his friends (2004) named as "The relation between the Anxiety Levels before and after Competition Performance",when it is thought that sportsmen have too intense stress and anxiety in competition periods, it has been concluded that uncontrolled anxiety case affects performance of sportsmen negatively and it also causes failure. (V. Yılmaz, Z. Korunç, 2004). In the study of Çoksevim and his friends (2006) named as "The Inventory Fındıngs of the Permanence, Circumstance and short symptom in Kick Boxing sportsmen before and after matches",the study has been made on 20 national sportsmen in the branch of Kick Boxing and it has been observed that in competition sports, even in sportsmen at upper level,there is an intense anxiety before the match (B. Çoksevim, N. Sarıtat, 2006). The reason of this is determined as the cause of sportsmen's being sensually stressful before the competition can be the excitement of being elite sportsman, heavy concentration, getting a high degree and the thought of being champion.These studies support our research results.

Conclusions

It appears that each one of the factors affecting failure of sportsman related to one another, and if there is a lack of oe of them, it causes failure of sportsman. Therefore, until the competition time,the conditions before competition, the relation between trainer and sportsman,the frequency and regularity of training affect both success and failure of sportsman. So, it is thought that trainers and families of sportsmen should be made conscious.

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EFFECT OF TECHNICAL SPORTIVE LOADING UPON THEMALONDIALDEHYDE (MDA) AND TRACE METALS LEVELS OF BOXERS

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Abstract

This study was carried out to investigate the effect of 2 hour technical boxing training upon antioxidant Malondialdehyde (MDA) and trace metals (Zinc – Selenium) levels. The study was participated by 30 male boxers from different weights with an average age of 20.09 ± 1.22 years. The participants were fed with a zinc and selenium free diet before the study and they were asked not to use and Zn- Se containing vitamins or tablets. There were 5cc venous blood samples taken from the participants and the participants were subjected to 2 hour training program after a 15 minute resting period. They 5 cc venous blood samples were taken from the participants at exhaustion. The Zn-Se and MDA levels were determined by ICP and Conti method respectively. The comparison of the pre and post training MDA and Zn-Se values revealed that there was a statistically significant difference between them ($p<0.01$). The results showed that the boxing training resulted a decrease in both the MDA and Zn-Se levels in blood. There was a positively directed weak correlation observed between post training MDA, Zn and Se levels which gave no significant difference.

Keywords: boxers, technical, sportive.

Introduction

Zinc is a micro nutrient necessary for more than 300 enzymes in the body. Zinc takes an important role in many metabolic processes and regulates the hormone balance of the body. It is also important for immune system, productive system, wound healing, skeletal development and intestinal functions [16] .Zinc status has an important effect upon physical performance. Athletes may have a zinc deficiency induced by poor diet and loss of zinc in sweat and urine. Limited data exist on the relationship of performance and zinc status (M. Hazar. 2009)

Selenium is an essential micro nutrient for the human body needed in trace amounts. It attaches to the proteins in order to form selenoproteins, a class of important anti oxidants. The antioxidant property of selenoproteins prevents the harm made by free radicals on cell membrane. Free radicals are the side products of oxygen metabolism and promote chronic diseases such as cancer and heart problems. Other selenoproteins take role in the regulation of the thyroid function and immunization system (M Conti., P.C.Morand, P. Levillain, A.Lemonnier, 1991). The biological active form of selenium is its organic form. Inorganic selenium is rapidly discharged from the body. In nature the plants convert selenium in to its organic form. Selenium is one of the minerals which show the most rapid decrease. In his article "Selenium .It is time to act "published in British Medical Journal in 1997 M.P. Rayman states that there has been a 50 % decrease in the level of Se taken from food in last 22 years. He also emphasizes the increase in cancer, heart diseases and impotency during the same period. The people with irregular feeding habits or cigarette smokers are particularly at risk because of selenium deficiency. Selenium deficiency is particularly effective in weakening of the immunization system. The daily recommended intake of Selenium is 55 μg [1]. Intensive exercises require excessive oxygen use and consequently increases the amount of free radicals formed. The body responds it by activating the antioxidant mechanism and administration of antioxidants in pain treatment may be employed to decrease the doses of analgesics (P.M. Clarkson 1991; H. Çakir, Farkli Şiddette Uygulanan, 2006).

Malondialdehyde (MDA) is a product formed by the peroxidation of polyunsaturated fatty acids . MDA forms as a result of peroxidation of the fatty acids containing three or more double bonds. These fatty acids in mammalians are mainly aracidonic and docosahegzanoic acids. The oxidation of oleic and linoleic acids result in the formation of lesser amount of MDA .The resulting MDA effects the ion exchange mechanism in the cell membrane and cross links the compounds on it thus changing the ion permeability and ion activity . Athletes are capable to discharge MDA in rapid manner as a result of regular exercises. However the increase in the rate of oxygen use may result the reactive oxygen species to overcome the immunization barrier and result in oxidative stress (P.M.Clarkson, 1991).This study revealed that acute loading resulted no statistically significant changes in MDA content of athletes. This may be explained with the fact that the boxers are capable of coping with oxidant species as a result of the adaptation they developed against acute sportive loadings.

The athletes as a result of regular training are able to remove MDA from the cells in a rapid way. The adoption against the resulting oxidative products, formed as a result of intensive training, developed with intensive exercises may be responsible for the

chronically low MDA levels observed in athletes(P.M.Clarkson, 1991).

This study revealed that here was a significant change in the MDA levels as a result of acute exercise. This may be attributed to the high level of adaptation which the boxers developed against oxidative stress.

This study was carried out to investigate the change of the level of oxidant product MDA and anti oxidant Zn-Se as result of 2 hour intensive boxing exercise and to elucidate any relation between them.

Materials and methods

Physical and physiological measurements

Measurement of age, height and weight

Age of the participants is given in years. Height of the participants was measured with a metric scale on bare feet. The body weights were determined on bare feet with only shorts on with a Nan brand scale with an accuracy of ± 0.01 kg. All the measurements were taken one day before the start of the study.

Resting Heart-rate: The resting heart beat rates of the participants were recorded with a stethoscope at the morning of the day before the study at sitting and resting position. The results are given as beat per minute

Taking blood samples

There were 5cc of venous bloods taken from the left arms of the participants with heparinzed syringes by an expert nurse at rest position before the start of the training. The blood routes were kept open with a cut down catheter sealed with a plaster. The participants were allowed to rest for 15 minutes and subjected to 2 hours technical boxing training. There were 5 cc bloods collected from the participant at exhaustion just after the end of the exercise. The blood samples had been coded, centrifuged and kept at refrigerator before they were used for trace metal analyses.

Experimental method

ICP- OES Protocol microwave digestion procedure

Zinc and Se analyses were carried out in the laboratories of Science Faculty of Gazi University. Blood samples were drawn from the antecubital vein of the subject's right before, immediately after and I5 minutes after exercise. Sample preparations and measurements: On the I mL blood samples was added 2.0 mL HNO.i and the samples were digested in Berghof/Microwave Digestion system MWS-3 microwave apparatus. The microwaves were kept at 160 °C for 5 min and at 190, 100 and 80 °C for 10 min each. The totally digested samples were diluted to 10 mL with the addition of deionized water 18.3 18.3 mohm cm^{-1}.Zinc was analyzed directly using inductively coupled plasma optical emission spectrometry (ICP-OES, Perkin Elmer, Optima 5300 DV, USA).There were 100,250,500 and 750 ug/L standard Se solutions were prepared from its 1000 ppm standard solutions and a calibration curve was plotted. Then selenium analyses of each sample were performed by making at least five readings. The results are tabulated in Table 2 Selenium was converted to its hydride before the analyses . 1 mL of 10% HCL was added onto 1 mL of digested blood samples and kept at 90 °C for 20 minutes. The samples were analyzed with the use of Perkin Elmer Optima 5300 DV model ICP-OES after they were cooled down.

Malondialdehyde (MDA) analysis

MDA measurements were carried out in the laboratories of Faculty of Medicine of Gaziantep University. Plasma lipid peroxidation was evaluated by a fluorometric method based on the reaction between MDA and thiobarbituric acid (TBA) (Conti Method). Briefly, 50 µL of plasma was added to 1 mL of 10 mmol/L diethylthiobarbituric acid (DETBA) reagent in phosphate buffer (0.1 mol/L, pH 3), mixed for 5 s and incubated for 60 min at 95 °C. Samples were placed in ice for 5 min and then 5 mL of butanol were added. The mixture was shaken for 1 min to extract the DETBA–MDA adduct, and then centrifuged at 1500 × g for 10 min at 4 °C. Fluorescence of the butanol extract was measured at the excitation wavelength 5

39 nm and the emission wavelength of 553 nm. 1, 1, 3,3-Tetraethoxypropane(Sigma) was used as a standard solution and the values were presented in µmol/L. [3]

Training protocol of the participants

Intensity of loading: 70 – 90 % sub maximal

Time: 2 hours

Resting: 5 minutes; for exercise 3 – 7 (Stretching)

1 - 15 minutes warm up (running)

2 - 15 minutes warm at rest (stretching)

3 - 5 x 3 minutes shadow boxing (5 round x 3 minutes)

4 - 5 x 3 minutes bag beating.

5 - 5 x 3 minutes modeling (Direct, uppercut, swing)

6 - 5 x 3 minutes sparring

7- 10 x 2 minute's lapa

8 - 10 minutes stretching

Statistical analyses of the data

The analysis of the data obtained was carried out by the use of SPSS 10.0 statistical software. The comparison of the pre and post training measures was made by paired simple t-test and the relations between two variables were evaluated by the use of Pearson Correlation technique.

Results

Physical parameters of the participants

Table 1. Physical parameters of the participants.

Parameter	Mean values ($\bar{X}$)	SS	Minimal Maximal
Age (year)	20.09	1.22	18 - 22
Height (cm)	176.00	6.67	163- 188
Body weight (kg)	72.45	15.37	48- 101
Resting heart rate (Beat/minute)	77.72	7.07	68 - 90

Pre and post exercise blood zinc levels of the participants

Table 2. The statistical analysis revealed that there is a significant difference between the pre and post- training Zinc values of the participants [$t_{(29)}$ =6. 23; p<0.01].

Element	N	Pre test mean value ($\bar{X}$)	S	Post test mean value ($\bar{X}$)	S	$\bar{X}1-\bar{X}2$	t	p
Zinc (µg/L)	30	245,64	15,70	216,70	10,29	28,94	6,23	.000

Pre and post exercise blood selenium levels of the participants

Table 3. The statistical analysis revealed that there is a significant difference between the pre and post- training Se values of the participants [$t_{(29)}$ =11.41; p< 0.01].

Element	N	Pre test mean value ($\bar{X}$)	S	Post test mean value ($\bar{X}$)	S	$\bar{X}1-\bar{X}2$	t	p
Selenium (µg/L)	30	277.18	1,15	208.42	5,78	68.76	11.41	.000

Pre and post exercise blood MDA levels of the participants

Table 4. The statistical analysis revealed that there is a significant difference between the pre and post- training MDA values of the participants [$t_{(29)}$ =8.13; p< 0.01].

Enzymes	N	Pre test mean value ($\bar{X}$)	S	Post test mean value ($\bar{X}$)	S	$\bar{X}1-\bar{X}2$	t	p
MDA (micromol/L)	30	4.99	1.16	3.47	0.99	1.52	8.13	.000

Correlation between pre test Zn and MDA levels

Table 5. There is a low level negative directed significant correlation between the pre test MDA and Zn levels of the participants [r=-0.329; p>0.05].

		Pre test Zn	Pre test MDA
Pre test Zn	Pearson Correlation	1	-,329
	Sig. (2-tailed)	.	,076
	N	30	30

Correlation between post- test Zn and MDA levels

Table 6. There is medium level positive directed significant correlation between the post test MDA and Zn levels [r=-0.244; p> 0.05].

		Post test Zn	Post test MDA
Post test Zn	Pearson Correlation	1	,244
	Sig. (2-tailed)	.	,193
	N	30	30

Correlation between pre test Se and MDA levels

Table 7. There is a medium level negative directed significant correlation between between the pre test MDA levels of the participants [r=-0.504; p< 0.05].

		Pre test Selenium	Pre test MDA
Pre test Selenium	Pearson Correlation	1.000	-.504
	Sig. (2-tailed)	.	.005
	N	30	30

** Correlation is significant at the 0.01 level (2-tailed).

Correlation between post- test Se and MDA levels

Table 8. There is a low level positive directed week an in significant relation between the post test MDA and Se levels [r=-0.202; p> 0.05].

		Post test Selenium	**Post test MDA**
Post test Selenium	Pearson Correlation	1.000	-.202
	Sig. (2-tailed)	.	.285
	n	30	30

Discussion

Burn et al. have investigated the serum zinc levels of 20 gymnasts (9 males and 11 females) and found that the average serum zinc level was 0.599±0.026 mg/L which was below the value obtained 116 sedentary control group (0.81±0.014 mg/L).The average serum zinc level he level of girls (0.557±0.023 mg/L) was found to be lower than that of boys (0.651±0.044 mg/L). These values were found to be significant at ($p<0.01$) level. There was also a positive correlation between the isometric adductor muscle strength and blood zinc level ($p<0.05$).

Cordova et al.studied the blood zinc levels of 12 volleyball players and 12 controls and found that there was an increase in both of them after the exercise. They also observed that 24 h zinc discharge with urine showed a 22% increase in volleyball players and showed a slight decrease in the control group. There was an enormous increase in the discharge of zinc with sweat in volleyball players (300%) as a result of prolonged exercise while this value remained 30% for the control group. The serum zinc levels of athletes increased by 4% in athletes and 2% in controls. Van Loan et al (J.F.Run, C.Dieu-Cambrezy, A.Charpiat C.Fons, C.Fedou, J.P.Micallef, M.Fussellier, L.Bardet A.Orsetti) nvestigated the effect of zinc loss upon the muscle functions and they found that plasma zinc level showed a decrease of 67% as a result of isokinetic extension. They also observed that the loss of zinc caused a significant decrease in muscle strength and total work capacity.

There is no consensus about the status of the zinc level with the physical exercise while others say the opposite. Some of the researchers claim that the blood zinc levels decrease. Kaya (F.Rslan,2009), A. Hazar (Ikukawa., A. Kobayashi., 2002), Aslan (An Loan Md., B. Sutherland, N. Lowe., J.R.Turnlund ., JC.King, , 1999), Van Loan et al (J.F.Brun, C.Dieu-Cambrezy, A.Charpiat, C. Fons., C. Fedou., JP. Micallef, M,Fussellier, L.Bardet, A. Orsetti A,1995).Kikukawa and Kobayashi This study showed that Zinc level decreased from 245.64 ± 15.70 µg / L to 216.70 ± 10.29 µg /L as a result of acute training.

As an integral part of glutathione peroxydase and tioredoxine reductrase selenium probably interacts with each compound which effects the antioxidation balance. Among the critical components of the antioxidant enzymes are copper, zinc (as süperoxide dismutase) and iron (catalase). Selenium acts in the limitation of the oxidation of fats and supports the activity of vitamin E as glutathione peroxidase The experiments carried out on animals showed that selenium and vitamin E complement each other and revealed that selenium may prevent some of the complications stem from the deficiency of vitamin E (M Conti., P.C. Morand., P.Levillain, A.Lemonnier, 1991**)**.Few results are available concerning Se concentration during or following physical activity (M. Jose., L. Alonso., A. B. Barrera., J.´ A. Cocho, De J., Jose´ M. F. Bermudezb., P. B. Barrera., 2005; Ga Milias., T. Nomikos, E. Fragopoulou, S. Athanasopoulos, S. Antonopoulou, Biofactors, 2006).The selenium concentrations obtained for each samples are follows: For the human placenta between 0.56 and 1.06 µg/g , for the umbilical cord blood 51.1–104.2 µg/g , for the maternal blood between 57.3 and 117.9 mg/l and for hair and nails 0.22–1.5 µg/g and 0.46–1.57 µg/g (R. Kyta., V. Holecek.,I. Pekárková, J.Krejcová., J.Racek, L.Trefi,A.Yamamotová, 2003) Milias et al (H C. Ukaski., 2004)examined the effect of eccentric exercise upon baseline serum levels of selenium (Se), a trace element that participates in both antioxidant and anti-inflammatory systems, affects the overall response to injury. Thirteen males performed 36 maximal eccentric actions with the elbow flexors of the non-dominant arm on a motorized dynamometer. The main finding of this study was that baseline Se serum levels were associated inversely with CK, LDH and flexed arm angle (FANG) and positively with isometric torque (MIT), and range of motion (ROM) ($p<0.05$). These data suggest that beyond overt Se deficiency, suboptimal Se status possibly worsens muscle functional decrements subsequent to eccentric muscle contractions. This study showed that selenium level decreased from 277.18 ± 1.15 µg / L to 208.42 ± 5.78 µg /L as a result of acute training.

The literature results related to the MDA response towards an acute exercise are sporadic. There are reports claiming the MDA levels decreased, increased or unchanged after the exercise (H.Çakir, F. Ş. Uygulanan, 2006).

Athletes are able to discharge MDA from the cells in a rapid manner as a result of adaptation developed by regular exercise. This may explain the chronically low MDA levels observed in athletes after strenuous exercise (H.Çakir, F. Ş. Uygulanan, 2006).When we look at the studies related to the change of the anti oxidant protection mechanism we

see that there is a decrease in MDA levels after sportive activities. The MDA levels were observed to show a statistically significant decrease as a result of acute exercise. The MDA value showed a decrease from 4.99 to 3.47 μmol/L. This is in perfect concordance with the studies of Çakır (2006) who found a statistically significant decrease at MDA levels at the end of the fourth week in two groups of participants subjected to a two different 6 week endurance training ($p<0.05$) N.Cases, A.Sureda, I.Maestre, P.Tauler, A.Aguilo , A.Cordova ,et al., 2006). However Cases et al [8].stated that there was no significant change in the MDA levels as a result of cycling races which took 235 and 255 minutes respectively in their study carried out on 177 cyclists ($p>0.05$) (8). Robertson et al. reported that the MDA levels of sedentaries were higher than the runners after an acute exercise in their study they carried out on 6 sedentaries and 20 runners making different exercises (margaritis i., tessier f., prou e., marconnet p., marini j-f., 1997). Aslan et al. (J.Pincemail, J.Lecomte, J.Castiau et al., 2000) applied a 15-20 minute sub-maximal running training protocol to 15 healthy male participants and observed a significant increase in the MDA levels after the training period ($p<0.01$). T.Sinoforoglu (reported that the MDA levels of the athletes did not show any significant difference after a 50 min aerobic ($p>0.05$). However there was a significant decrease in the sedentaries after the exercise ($p<0.01$). S.Gonenc (Jd. Robertson., Rj. Maughan, Gg Duthie., PC. Morrice., 1991**)** reported that there was a significant change in the MDA levels of children after 4 week swimming exercise ($p<0.05$).

This study also revealed that MDA levels decreased from 4.99 ±1.16 to 3.47 ± 0.99 μmol/L after the exercises which comply well with literature values.

There was not any significant difference in MDA values. This is due to the fact that regular exercising activates the anti oxidant defensive mechanism which increases the removal of MDA from the body. The main reason for the decrease in MDA levels in our study increased antioxidant defensive mechanism of the athletes as a result strenuous exercises. However as a result of increased oxygen utilization during sportive loading process which may surpass the anti oxidant defensive mechanism may eventually cause an oxidative stress. The decrease in MDA levels after the exercise may be attributed to the adaptation mechanism boxers developed.

In conclusion there was a significant decrease in Zn-Se and MDA levels as a result of acute sportive training ($p<0.01$). This may be explained by the quick adaptation of the boxers to the oxidative stress as a result of regular training. The decrease in Zn and Se levels may be attributed by the increased free radical production as a result of increased oxygen use during the physical activity which in turn activates the antioxidation mechanism.

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A STUDY ABOUT CLUB ADMINISTRATORS' TRANSFORMATIONAL LEADERSHIP PROPERTIES ACCORDING TO PERCEPTION OF PROFESSIONAL FOOTBALLERS

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ABSTRACT

The purpose of the study is to investigate the professional footballers' perceptions of their administrators' transformational leadership styles and its effect on the team. The population of the study is consist by 4902 professional footballers that play in Turkish Professional Football Leagues, also the sample of the study consisted 1014 footballers from 65 teams that selected by random sampling. "Transformational Leadership" questionnaire had used for data collecting to determine the transformational leadership level of club administrators. In data analyzing; frequency, homogeneity of variances, one–way ANOVA, Tamhan-T2 and Tukey tests had used. According to the findings it had determined that the 44,1 % of the subjects were 23–29 ages, 70,3 % had graduated from primary school and 48,3 % of them had job experience of 7–10 years. According to the results of analyze, transformational leadership style perceptions' sub-factors of "Suggested Motivation" and "Individual Support" has a significant difference with the variable of age (p<,05). As a result, it had found out that administrators who have transformational leadership have more effect on footballers. By those data, it could be said that administrators who have transformational leadership feature helps the footballers to reach the reachable and peak goals and they also respect to success and trustful players.

Key Words: Footballer, Administer, Transformational Leadership.

Introductıon

Football plays an important role in multicultural communication as other sportive activities in 21st century. In this global activity century, football clubs try to reach their aims and targets. Long term success depends on suitable goals of clubs' management structure and managing in efficiency and modern methods H.Mollaogulları, 1998. Increasing the rivalry in football also changing the administrators' social statues, methods, tools, values and life styles. In this changing process, one clubs' being success and getting peak performance from club footballers related to having powerful leadership skills. The most important issue of this kind of leadership is warning the club staff for moving to adapting changes[10].

The key of being transformational leadership is "changing". Transformational leaderships define themselves as represantitives of changing. Leaders gains priority to moral values like; top ideals, freedom, justice, equality, peace. They don't care about effecting their followers by fear, greed, jealous and hate[21].

Football club administrators obtain to recognize the footballers or club staff about their capacities, skills, confidence, so they can motive themselves and becoming succsess, and at last novelty begins in club atmosphere[10]. If the club administrators have transformational leadership ability, football clubs can have changing, cooperation, peak performance and can increase quality, intellectual accumulation in an institutional culture (H.Mollaogulları, 1998). Transformational leadership is suitable behavior concept in sport clubs like other organizations. So, transformational leaders behaviors' dimensions and its effects on staff, become a popular research area.

There're some researches in football clubs about trainners' transformational leadership features as apply them "middle level" administrators. Tozonoglu (2003), found that there's no significant difference between trainners' age, marital status variables and leadership styles in various sports (E.Tozoglu, 2003).E. Koruk, 2003, expressed that reaching of a trainner's goal is equal to reaching own club's goal. In V.O.Celik's ,2005, research, it had found that amateur football trainners in Eskisehir generally having transformational leadership features. By these researches, administrators' transformational leadership features means that it gains to footballers knowing their positive and negative features, solving problems in team by suitable ways, encouraging to express their feelings, being a model, showing their love and compassion, supporting their self respect and how to deal with loosing and how to be flexible in hard times (V.O.Celik's , 2006.)

In football clubs, especially adaptation between footballers and its affectivity had searched in the context of transformational leadership researches. Football clubs are the effective research subjects that contain relations between individuals and group dynamics by producing own values. The problems which appears from administrative structure in football don't determine clearly yet, this study has been done since it was required. Thus, the purpose of this study is to determine the relation of footballers' perceptions on their administrators' transformational leadership styles.

Methods

In this section, the model of the search, population and sampling, the method of data collecting, data collecting tool and its validity and reliability and details of statistical techniques which are used for data analysis had summarized. Literature searching and

descriptive method is chosen, to be able to find out the current situation.

League	Turkcell Super League		1st League		2nd League		3rd League		Total	
	Team	Player	Team	Player	Team	Player	Team	Player	Team	Player
Population	18	722	18	581	50	1303	65	2115	151	4721
Sampling	7	278	9	228	22	279	27	329	65	1014
Ratio (%)	**38,8**	**38,5**	**50**	**39,2**	**44,0**	**21,4**	**41,5**	**15,5**	**43,0**	**21,7**

Table 1: The number of Professional Football Teams and Players

Table 1 indicates the population of footballers from 151 teams-4721 players in 2007-2008 football season according to data of Turkish Football Federation, Professional Football Division. The sampling of the study is existing from 65 professional teams' 1014 players by using random sampling method.

"Individual Information Form", which developed for footballers, was used in the study. Transformational Leadership questionnaire was formed as dependent variable of the study. Professional footballers' age, education status, period of professional football playing, playing duration in a team and the status of league are choosen as independent variables. Transformational Leadership Questionnaire (TLQ) was used to determine the leadership style. It's validity and reliability had been done by Cemaloglu[7]. While adapting the questionnaire to sport, in order to prevent meaning corruption, the questionnaire was supported by 3 philologists, and was formed by specialists of area, as well. To determine the applicability of the questionnaire, adding to sampling, the questionnaire was applied to 200 active footballers at Ankaraspor, Ankaragucu, Genclerbirligi and Hacettepe football clubs, and corrections had been done according to the feedbacks. There are 40 items in data collecting tool; Ideal Effect, Suggested Motivation, Intellectual Stimulation and Individual Support factors each containing 10 items. In this study, transformational leadership sub-dimensions had been calculated and the data related to results were excluded. 5 Likert questionnaire had used in the study; Never (0), Rarely (1), Sometimes (2) Often (3) and Always (4). SPSS had been used for analyzing the data.

To find out reliability of questionnaire, the pre-test had been applied to 200 footballers (Ankaraspor, Ankaragucu, Genclerbirligi and Hacettepe clubs). The factor value is between 71 and 89. Total variance of transformational leadership is 63. and the Cronbach alpha is 94.

Individual Information Form and Transformational Leadership Questionnaire had been applied to professional football club administrators, technical directors, trainers, footballers in a duration of 11 months from April-2007 to February-2008. The questionnaire had being filled by subjects voluntarily. In the study, professional and active footballers were preferred. In the study, statistical method for data evaluation; frequency, percentage, T-test and one-way variance analyze (ANOVA) was used to determine the significant difference. If the result of the test was meaningful, Scheffe test from Post Hoc test had used-(S. Buyukozturk. 2006).

Results

In this part "Transformational Leadership" data had been shown. Demographic features of sampling group and perceptions of transformational leadership categorized as clubs. Also club administrators' transformational leadership approaches' effect on efficiency had been searched. Frequency and percentage data about age, education status, job experience, playing duration in team and the status of league had been shown in the table 2.

Table 2. Individual Features of Professional Footballers

Variables	Sub-categories	f	%
Age groups of Footballers	16-22 years	203	20,0
	23-29 years	447	44,1
	30-36 years	357	35,2
	37 Years and up	7	,7
	Total	**1014**	**100**
Education Status	Primary	98	9,7
	Elementary (High School)	713	70,3
	Bachelor	189	18,6
	Master	14	1,4
	Total	**1014**	**100**
Job Experience	1–3 years	31	3,1
	4–6 years	147	14,5
	7–10 years	490	48,3
	11 years and up	346	34,1
	Total	**1014**	**100**
Teams Situation	3.League	329	32,4
	2.League	279	27,5
	1.League	228	22,5
	Super League	178	17,6
	Total	**1014**	**100**

Footballers 44,1 % are 23–29 years old and 7 % is 37 years and up. Footballers 70,3 % graduated from elementary school, 1,4 % have master degree. Footballers' 48,3 % have 7–10 years and 3,1 % have 1–3 years job experience. Footballers' 32,4 % plays in 3rd league and 7,6 % plays in Super League.

Table 3. ANOVA of Footballers' Transformational Leaderships Perception According to Age Variable

Sub-factors	Variables	Mean		Df	F	Sig.
Ideal Effect	18-23	34,95				
	24-29	34,60	Between Groups	3		
	30-35	33,65	Inner groups	1010	1,570	,195
	36+	33,42	Total	1013		
Suggested Motivation	18-23	35,54				
	24-29	35,49	Between Groups	3		
	30-35	34,33	Inner groups	1010	2,536	**,055**
	36+	30,85	Total	1013		
Intellectual Stimulation	18-23	33,78				
	24-29	33,40	Between Groups	3		
	30-35	32,68	Inner groups	1010	2,008	,111
	36+	28,00	Total	1013		
Individual Support	18-23	31,18				
	24-29	30,75	Between Groups	3		
	30-35	30,21	Inner groups	1010	2,801	**,039**
	36+	24,42	Total	1013		

In table 3, there's an significant difference between transformational leadership style's perception according Suggested Motivation [F(3-1010=2,53 , P<,05] and Individual Support [F(3-1010=2,80 , P<,05] sub-factors and age variable.

So, administrators' transformational leadership perceptions to Suggested Motivation and Individual Support sub-factors significantly difference related to age variable. There's no significant difference between Ideal Effect and Intellectual Stimulation sub-factors related to age variable (p>,05). Scheffe test had been done for determining the difference, it was found that Suggested Motivation sub-factor in 18-23 years old, =34,95 recognized positive in top level, +36 years old footballers' Individual Support (X=24,42) determined lower.

Table 4. ANOVA of Footballers' Transformational Leaderships Perception According to Education Level

Sub-factors	Variables	Mean		df	F	Sig.	Groups
Ideal Effect	3rd League	34,27					
	2nd League	35,08	Between	3			Super League and 2nd-3rd League
	1st League	33,52	Groups	1010	4,522	,004	
	Super League	30,84	Inner groups	1013			
			Total				
Suggested Motivation	3rd League	35,03					
	2nd League	35,77	Between	3			Super League and 3rd League
	1st League	34,55	Groups	1010	3,743	,011	
	Super League	29,81	Inner groups	1013			
			Total				
Intellectual Stimulation	3rd League	33,15					
	2nd League	33,90	Between	3			Super League and 1st, 2nd and 3rd Leagues
	1st League	32,32	Groups	1010	10,767	,000	
	Super League	30,21	Inner groups	1013			
			Total				
Individual Support	3rd League	30,77					
	2nd League	31,14	Between	3			Super League and 1st, 2nd and 3rd League
	1st League	29,50	Groups	1010	12,271	,000	
	Super League	28,62	Inner groups	1013			
			Total				

According to analyze results, there's no significant difference in footballers' perception of their administrators transformational leadership style (p>,05). Thus, professional footballers' administrators' perceptions to transformational leadership not changing according to education level variable. In data, there's no significant difference in education variable, but it's found out in scheffe test, footballers' (graduated from High School) perception more positive (X= 35,20) in Suggested Motivation sub-factor, also it's found out Master degree footballers' perception more negative (X= 29,21) in Individual Support sub-factor.

Tablo 5. ANOVA of Footballers' Transformational Leaderships Perception According to Playing League Status Variable

Sub-factors	Variables	Mean		df	F	Sig.
Ideal Effect	Primary	34,37				
	High School	34,50	Between Groups	3		
	Bachelor	33,75	Inner groups	1010	4,153	,006
	Master	33,07	Total	1013		
Suggested Motivation	Primary	34,40				
	High School	35,20	Between Groups	3		
	Bachelor	34,94	Inner groups	1010	6,569	,000
	Master	33,85	Total	1013		
Intellectual Stimulation	Primary	33,57				
	High School	33,38	Between Groups	3		
	Bachelor	32,32	Inner groups	1010	3,411	,017
	Master	32,28	Total	1013		
Individual Support	Primary	31,44				
	High School	30,77	Between Groups	3		
	Bachelor	29,64	Inner groups	1010	3,448	,016
	Master	29,21	Total	1013		

4. Discussion

In Table 2, 44 % of professional footballers in 23–29 years old. After beginning the football and in the period of beeing professional they have hard working tempo, so that makes these age parameters normal. Studies on professionel footballers like F.N. Arslan, 1995, he had found age avarage as 24,6 years[2] and also Y. Ocak, 1996, had found age as 24,5 years in his study[16]. Iyem's (2007), results had showed that 47,4 % of subjects' age as 25 years C. Iyem, 2007, these results show similarity with this study. In groups there are young footballers (16–22 years old - 20 %), so it could be said that clubs paying more attention to young footballers' age of beginning to football and also education level. Footballers over 37 (%,7) is very low, it can be a proof for this issue. The high education level of footballers brings quality in the team. Doğan's (1993) research (45,3 %) and Erol's (1997) research showed that (69,1%) footballers' education level is mostly secondary education (B.Dogan, 1993, M.Erol, 1997). Research data shows that 48,3 % of footballers have 7-10 years and 3,1 % of them have 1-3 years job experience. Playing in a professional team requires minimum 16 years old. In table 1, the age range recognized as 23-29 years. Footballers in the study have playing in the same team 4-6 years (38,6 %) and 11 years/over (3,2 %). Also 32,4 % of them plays in the same team in 3rd League and 17,6 % of them in Super League.According to data of Turkish Football Federation, professional leagues continue by 151 teams (Turkcell Super League 18 teams, 1st Leagues 18 teams, 2nd Leagues 50 teams and 3rd Leagues 65 teams). By the way, being more teams in 2nd and 3rd Leagues related to number of footballers. Plans to reach the aims and targets of clubs must contain all conditions, the changeable sport "football" and clubs with a complex structure make forced to administrators to behave with Suggested Motivation and Individual Support S.Arıkan, 2001. In this situation, administrators become an inspiration tool for high performance, getting new perspectives, a healthy club atmosphere, determining visa verse expectations and loyalty to most wanted aim. In this clubs that having this atmosphere, footballers who can have face to face communication with administrators knows that they're listening, paying attention to their ideas and encourages with respect (R.Yigit 2002). In this relation, always there's feedback and correlation of individual needs. Administer who encourages the development, shares the authority. In this period, it could be said that administrators show respect, trust and tolerance to some mistakes. (O. Gokkaya, 2005). In Scheffe test results Suggested Motivation sub-factors of 18-23 ages footballers are more positive from footballers in +36 ages (X= 34,95), also they're positive in Individual Support (X=24,42). Administrators preparing an atmosphere by Suggested Motivation and Individual Support, is important to getting personality, using initiative, respecting others and having experiences.

According to these data, administrators' reaching the aims, solving the problems, moving together with footballers, communicating and motivating them always makes positive effects on young footballers. In +36 ages group, footballers feel that administrators are insufficient in Individual Support dimension. These data shows that building a collective conscious changes from club to club, also it could be said that +36 ages footballers do not need individual support, they're providing individual support (A. Berber, 2001). According to H.B.Yıldırım, 2004, age of workers is related to gaining satisfaction. By aging, people having less satisfaction. This situation supports Davis's study. Especially + 36 ages footballers by more experience feel more habits to social life. It could be said that, this situation cause an important effect to decreasing of footballers expectations from their football career. In table 4, there's an significant difference between footballers' perception on administrators' transformational leadership and education levels (p>,05). So, it could be comment as homogeneity and peak level of professional education of footballers give them an opportunity to show their abilities and skills. In table 5, transformational leadership styles sub factors of Ideal Effect [F(3-1010=4,52,P<,05], Suggested Motivation [F(3-1010=3,74, P<,05], Intellectual Stimulation [F(3-1010=10,76, P<,05] and Individual Support [F(3-1010=12,27, P<,05] have a significant difference with League Status variable (p<,05). Professional footballers' administrators transformational leadership styles perceptions differed by the League Statue. Transformational Leadership sub-factor Ideal Effect is more important for 2nd and 3rd League players than Super League players. But it could be said that reaching high performance level by only this feature. Transformational leadership feature must practice and care about totally. In Suggested Motivation sub-factor, there's a significant difference in Super League and 3rd League, in Intellectual Stimulation sub-factor there's a significant difference between Super League and 1st, 2nd and 3rd Leagues. In Individual Support sub-factor, there's a significant difference between Super League and 1st, 2nd and 3rd Leagues (p<,05).It could be said that 2nd and 3rd Leagues footballers want to see own administrators in passion, integration with team, desire and rage. It's determined that, Super League footballers had been less positive perceived in Ideal Effect dimension (X=30,84), Suggested Motivation (X=30,21), Intellectual Stimulation (X = 30,21) and Individual Support sub factors (X =28,62). Thus Super League clubs have a more institutional administrative structure according to other teams and having more participation to management. There are important results in some studies about sport clubs and also other areas in this subject. al. 2005, found out transformational leadership increases institutional addiction (A. Ceylan, H. Keskin, S. Eren, 2005). C. Arslantas, 2007, had searched 233 subjects in a firm in two departments, it had found out that, transformational leaderships all dimensions effects being psychological strong in different ways. H. Zeren's, 2006, research results showed that primary school teachers "sometimes" participated to school principals' transformational leadership style's individualized attention dimension. As a result, it's determined that administrators who have transformational leadership feature have an determinative effect on footballers. Administrators who have transformational leadership feature, helps the footballers to reach the reachable and peak goals, give moral and they also respect to success and trustful players in the clubs that they managed.

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Tabel no1. Number of Professional Football

Variables	Sub-categories	f	%
Age groups of Footballers	16-22 years	203	20,0
	23-29 years	447	44,1
	30-36 years	357	35,2
	37 Years and up	7	,7
	Total	**1014**	**100**
Education Status	Primary	98	9,7
	Elementary (High School)	713	70,3
	Bachelor	189	18,6
	Master	14	1,4
	Total	**1014**	**100**
Job Experience	1–3 years	31	3,1
	4–6 years	147	14,5
	7–10 years	490	48,3
	11 years and up	346	34,1
	Total	**1014**	**100**
Teams Situation	3.League	329	32,4
	2.League	279	27,5
	1.League	228	22,5
	Super League	178	17,6
	Total	**1014**	**100**

Table 2. Individual Features of Professional

League	Turkcell Super League		1st League		2nd League		3rd League		Total	
	Team	Player	Team	Player	Team	Player	Team	Player	Team	Player
Population	18	722	18	581	50	1303	65	2115	151	4721
Sampling	7	278	9	228	22	279	27	329	65	1014
Ratio (%)	**38,8**	**38,5**	**50**	**39,2**	**44,0**	**21,4**	**41,5**	**15,5**	**43,0**	**21,7**

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EFFECT OF L- CARNITIN AND THERMAL STRESS ON FREE RADICAL AND ANTIOXIDANT LEVELS IN RATS DURING THE EXHAUSTIVE SWIMMING EXERCISES AT HYPOTHERMIC AND HYPERTHERMIC WATER TEMPERATURES

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SUMMARY

Carnitine plays an important role in lipid metabolism by transporting long-chain fatty acids into the mitochondria for beta-oxidation.The aim of this study was to explain the effect of acute L-carnitine on antioxidant levels and lipid peroxidation in rats exposed to thermal stress.

Eight groups (E18°C, E28°C and E38°C exhaustive swimming groups; CE18°C, CE28°C and CE38°C L-carnitine and exhaustive swimming exercises groups; CS28°C (the sedentary group which is given carnitine); S28°C (only the sedentary group), were formed and a total of 48 Sprague Dawley male rats, weighing 250-300 g were used in this study. In the study, the L-carnitine was given to the groups 1-1.5 hours before the exercises in the doses of 100 mg/kg by intraperitoneal (i.p.) way. Exhaustive swimming tests were made in a rectangle shaped glass water tank that was 80x60x60 cm^3 in size. Uncoordinated movements and staying under the water for 10 seconds without swimming at the surface were accepted as the exhaustion criteria of the rats. In the blood samples, the SOD, GR, POD and CAT are analyzed with spectrophotometric method, and MDA is analyzed with HPLC-FLD method. In the statistical analysis of the study, Anova, Duncan and T Tests are used.

According to the results of the study, the MDA level of the CE18°C group is significantly higher than those of CE28°C and CE38°C groups ($p<0.05$). While the GR levels of E18°C group is significantly higher than the CE18°C group ($p<0.05$,), the POD levels are significantly low ($p<0.05$,). The POD levels of CE28°C group is significantly higher than those of E28°C group ($p<0.05$).

The findings that are gathered at the end of the study showed that the oxidative stress increases under hypothermic circumstances and it cannot prevent the free radical formation of the L-carnitine under hypothermic conditions, in addition it increases the antioxidant activity under thermal stress. The L-carnitine supply under thermal stress may show an antioxidant effect and be useful in sports activities.

Keywords: L-carnitine; exercises; rat, water temperatures, antioxidant enzymes; lipid peroxidation.

1. Introduction

The adaptation in skeletal muscle to endurance training includes increases in mitochondrial content, respiratory capacity, capillary density and lipid oxidation capacity (K.Sahlin, RC. Harris, 2008). L-carnitine plays a key role in lipid metabolism (M.S.Aoki., Almeida ALRA., F.Navarro, LFBP. Costa-Rosa., RFP.Bacurau, 2004). L-carnitine (4-*N*-trimethyylammonium-3-hydroxybutyric acid), stored within skeletal muscle tissue (E.Broad, C. Bolger, S.Galloway, 2006) and cardiac muscle as either free or acyl carnitine (FB. Stephens, DC.Teodosiu, D. Laithwaite, E.J. Simpson, L. Paul, P.L.Greenhaff, 2006), and plays important physiological roles shuttling the long-chain fatty acids across the inner mitochondrial membrane for ATP production and β-oxidation in peripheral tissues (I.Gülçin, 2006).

It is still a subject of discuss whether the administration of L-carnitine improves performance of intensive endurance exercise (E.P.Brass, 2000). Several researchers indicated that L-carnitine supplement, have benefitial effects on exercise performance and thus it increases fat oxidation during prolonged exercise, preserves glycogen stores and delays the onset of fatigue (F.B.Stephens, D.C. Teodosiu, and P.L. Greenhaff, 2007, J.S. Volek, W.J.Kraemer, M.R. Rubın, A.L. Gomez, N.A. Ratamess, and Gaynor, 2002, C. Greigh K.M.Finch, D.A.Jones, M. Cooper, A.J.Sargeant 1987), clained that in researches they carried out with various different exercise, taking carnitine before exercise or increasing of acute carnitine have no effect on performance, and , Ransone et al., L- carnitine has no effect on the lactic asid accumulation in max. anaerobic exercises.

The body core temperature during exercise varies depending on enviromental conditions, such as the situation of training and acclimatization, the duration and intensityof exercise, and individual differences (Soultanakis-Aligianni, H.N.). During physicial exertion an understanding of thermoregulation is important in protecting athletes from injuries and in managing physicial performance under cold and heat conditions.

Thermal stress combined with physical exertion may lead to rise in bady core temperature (C.L.Lim, C.Byrne, J.K.Lee, 2008, G.A.Khomenok, A. Hadid, O.P.Bloom, R.Yanovich, T.Erlich, O.R.Tal, A. Peled, Y.Epstein, D.S.Moran, 2008). Many endogenic mechanisms serve in thermoregulation responces (Reilly, T., Drust, B., and Gregson, W., 2006). However the literature knowledge related to the effects of L-carnitine on the exercise done hypothermic and

hyperthermic ambient. (G.P.C.Janssens, J. Buyse, M.Seynaeve, E.Decuypere, R.D.Wılde, R.D., 1998), announced that heat production has decreased in exercising pigeons after L-carnitine supplementation. Exercise intolerance carnitine palmitoyl-transferase enzyme deficiency (CPT II) has been postulated to depend on low-carbohitrate-high-fat diet, exhaustive exercise, fasting, hypothermia and insomnia (M.C.Orngreen, R.Ejstrup, J.Vissing, 2003), and especially, it created skeletal muscle damage (A.Gentili E.Lannella, F.Masciopinto, M.E.Latrofa, L.Giuntoli, S.Baroncini , 2008).

In this study, we researched the effect of acute L-carnitine on antioxidant levels and lipid peroxidation in rats exposed to thermal stress. L-carnitine is an antioxidant, and it prevent accumulating end product of lipid oxidation (I. Gülçin, 2006).

2. Material and methods

2.1. Chemicals

L-carnitine, Nitroblue tetrazolium (NBT), xanthine, xanthine oxidase, oxidized glutathione,tiobarbituric acid (TBA), NADH and ABTS were obtained from Sigma company (Sigma-Aldrich GmbH, Sternheim, Germany). L-carnitine was obtained from Sigma (Sigma-Aldrich GmbH, Sternheim, Germany). All other chemicals used were Analytical grade and obtained from either Sigma-Aldrich or Merck.

2.2. Animals and groups

In this study, 48 healthy Sprague Dawley male rats, weighing 250–300 g, 4–6 months of age, were provided from Fırat University Experimental Animal Research Center (FUDDAM). The study was carried out in Atatürk University Research Center of Experiment Animals and the study was approved by the Ethical Committee of the Atatürk University (AUHADYEK, Ethical Committee Report No: 2008-51). All surgical procedures and protocols used here were in accordance with Guidelines for Ethical Care of Atatürk University Research Center of Experiment Animals.

The rats were kept under special conditions and were sheltered in cages, each of which has 6 rats, at the room temperature (25°C). The food (Bayramoğlu Yem Sanayi, Erzurum, Turkey) and water were supplied for 12–hour day and night cycles. In the study, the L-carnitine was given to the groups 1-1.5 hours before the exercises in the doses of 100 mg/kg by intraperitoneal (i.p.) way.

E (**exercises, 18°C):** The exhausted swimming exercises group at the temperature of 18°C).

E (**exercises, 28°C):** The exhausted swimming exercises group at the temperature of 28°C

E (**exercises, 38°C):** The exhausted swimming exercises group at the temperature of 38°C.

CE (**L-carnitine-exercises, 18°C):** The exhausted swimming exercises group with L-carnitine at pharmacological dosage (100 mg/kg) at the temperature of 18°C.

CE (**L-carnitine-exercises, 28°C):** The exhausted swimming exercises group with L-carnitine at pharmacological dosage (100 mg/kg) at the temperature of 28°C.

CE (**L-carnitine-exercises, 38°C):** The exhausted swimming exercises group with L-carnitine at pharmacological dosage (100 mg/kg) at the temperature of 38°C.

S (**sedentary, 28°C**): at 28°C, the sedentary group which no any practise (the control group).

CS (**L-carnitine-sedentary, 28°C**): The sedentary group at the temperature of 28°C with L-carnitine at pharmacological dosage (100 mg/kg) (the control group)

Exercise Protocol

Maximal intensely exhausted swimming exercises were applied to exercise and L-carnitine exercise groups in test group

Adaptation Training: For the rats to have adaptation, they were first made to have swimming exercise in a pool, 80 x 60 x 60 cm^3 for 5 minutes at 28^oC during 5 days (This temperature is the most appropriate for rat metabolism). A resistance of 2200 V and a digital thermometer (GEMO, micro software and PID thermo controlled device) were used to warm up the pool. After swimming exercise, the rats were dried with towels, made to rest for 30 minutes at a warm place and taken to cages.

Training: Training of Maximal Exhaustive Swimming Exercise. The exercise group (n:36) were made to swim at 18^oC, 28^oC and 38^oC until they felt tired. Beginning uncoordinated actions (unability of floating by minor extremity actions), remaining under water for 10 seconds without swimming were determined as tiredness criteria (RAL, Osorio, J.S. Christofani, VD. Almeida, AK.Russo, IC.Picarro, 2003).

Determination of temperatures

American Health Assembly (AHA), approved of normal body temperature as 36.5–37.2°C. The body temperature of rats is the same as those of humans. A naked person can keep body inner temperature fixed between 12.5°C and 55°C in dry weather (E. Siktar). For the body to feel the heat depends on the temperature of the weather, moisture rate and wind rate. 26–30^oC is the optimal temperature for performance in water sports (G.A.Brooks, T.D.Fahey, 1985).

In this study the temperature was determined 10^oC more or less than average temperature 28^oC as optimal temperature for performance, under 10^oC hypothermic (18^oC), over 10^oC hiperthermic (38^oC). In present study to determine temperature values of water, under 16^oC and over 38^oC posed risk for rats. The rats made to swim at 14 and 39^oC died and had severe complications in 5-10 minutes (three out of six).

Drawing of blood

Venous blood was drawn from the vein portae into a sterile plastic syringe (10 mL) using a sterile needle. Half of the drawn blood (5 mL) was added to a

plastic test tube containing 50 µL of heparin (1:100) to be used for the antioxidant enzymes assay, and the other 5 mL of drawn blood was added to a glass vacationer containing 15% EDTA (0.054 mL/4.5 mL) to be used for MDA levels.

2.4. Preparation of Hemolysate

Erythrocytes were isolated from fresh rat blood, which was obtained from the University Hospital Blood Centre following low-speed centrifugation at 1500 rpm for 15 min (MSE, MISTRAL 2000) by removal of plasma and buffy coat. The red cells were washed twice with 0.9% w/v NaCl and hemolyzed with 1.5 volumes of ice-cold water. Ghost and intact cells were then removed by high speed centrifugation at 20000 rpm for 30 min (Heraeus Sepatech, Suprafuge 22) at 4°C.

2.5. Hemoglobin Estimation

The hemoglobin (Hb) concentration in hemolysate was determined by the cyanmethaemoglobin method. All studies were performed at +4°C (Olcay H, Beydemir Ş, Gülçin İ, et al. Supuran, C.T, 2005).

2.6. Antioxidant Enzymes Activity Assays

SOD activity

SOD activity is one of the most important indicators of tissue antioxidant capacity. SOD activity determination was performed in the samples before and after adding trichloroacetic acid (TCA, 20%), as described. In this method, xanthine-xanthine oxidase complex produces superoxide radicals that react with nitroblue tetrazolium (NBT) to form a farmazane (NBT^{2+}) compound. SOD activity is measured at 560 nm by detecting inhibition of this reaction. By using blank reactions in which all reagents are present except the supernatant sample and by determining the absorbance of the sample and blank, SOD activity is calculated (Sun Y, Oberley L, Li Y, 1988).

Catalase activity

Catalase activity was assayed by monitoring the decrease in absorbance at 240 nm due to H_2O_2 consumption according to the method of (Aebi H., 1984). The reaction mixture contained 25 µL hemolysate, 0.5 mL 10 mM H_2O_2 and 0.9 mL 30 mM potassium phosphate buffer (pH 7.3). The decrease in absorbance was recorded at 240 nm for 60 sec. Enzyme activity was expressed as µmoles H_2O_2 decomposed by using the H_2O_2 extinction coefficient 36 $\mu M^{-1}cm^{-1}$.

Peroxidase activity

Peroxidase activity was measured by the method of (Shannon LM, Kay E, Law JY., 1966). For this purpose, 0.1 mL hemolysate was taken up into 1.7 mL 0.05 M potassium phosphate buffer (pH 7.3). Then 0.5 mL ABTS was added. The reaction was started by addition of 0.2 mL 0.2 M H2O2. Change in absorbance at 470 nm was recorded for 2 min at intervals of 15 sec. The enzyme activity was expressed as enzyme $unit.min^{-1}gHb^{-1}$.

Glutathione Reductase Activity

Glutathione reductase activity was estimated by the method of (Goldberg DM, Spooner RJ., 1983). To 0.1 mL haemolysate 2.5 mL 120 mM potassium phosphate buffer (pH 7.3), 0.1 mL 0.015 mM EDTA and 0.1 mL 0.065 mM oxidised glutathione were added. After 5 min, 0.05 mL 9.6 mM NADH were added and mixed. The absorbance was recorded at 340 nm at intervals of 15 sec. The enzyme activity was expressed as nmole NADH oxidised min–1.gHb–1 protein using the molar extinction coefficient 6.23 µM–1cm–1.

Determination of MDA

MDA concentrations in blood plasma samples were measured by the high-performance liquid chromatography with fluorescent detection (HPLC-FLD) previously described . Briefly 50µL of plasma sample was mixed in (0.44 M) H_3PO_4 and (42 mM) tiobarbituric acid (TBA), and incubated for 30 min in a boiling water bath. After rapidly cooling on ice, an equal volume alkalen methanol was added to the sample, votex, centrifuged (3000 rpm for 3 min), and the aquous layer was removed.

Then, 20 µL supernatant was analyzed by HPLC (HP, Agilent 1100 moduler systems with FLD detector, Germany): Column, RP-C18 (5 µm , 4.6 x 150 mm , Eclipse VDB- C18. Agilent) elution, methanol (40:60, v/v) containing 50 mM KH_2PO_4 buffer (pH 6.8) flow rate 0.8 mL/min. . Fluorometric detection was performed with excitation at 527 nm an emission at 551 nm. The peak of MDA-TBA adduct was calibrated a TEP (1,1,3,3- tetraethoxypropane) standart solition procedded in exactly the same as plasma and urine sample (Khoschsorur GA, Winklhofer-Roob BM, Rabp H, 2000).

2.7. Statistical Analysis

The experimental results were performed in triplicate. The data were recorded as mean ± standard deviation and analyzed by SPSS (version 11.5 for Windows 2000, SPSS Inc.). One-way analysis of variance ANOVA was performed by procedures. Significant differences between means were determined by Duncan's Multiple Range tests, and $p<0.05$ was regarded as significant, and $p<0.01$ was very significant.

3. Results

According to effect of L-carnitine, there was no difference between the groups took place the same water temperature (as E18°C and CE18°C) with regard to levels of MDA in Fig.1. The SOD values for serum increased significantly in the CE 38°C group according to the E 38°C group ($P<0.05$).The mean of standard derivations of groups respectively, 6.96±0.88 and 10.02±2.08. There was no difference between the E 18°C group and the CE 18°C group, between the E 28°C group and the CE 28°C group and between the S 28°C group and the CS 28°C group in Fig.2.

In Fig. 3, GR levels decreased significantly the CE 18°C than the E 18°C group ($P<0.05$). The values of CE 18°C and the E 18°C group were found as 0.31± 0.07 and 0.21±0.07. Not significant between E 28°C and CE 28°C, E 38°C and CE 38°C and S 28°C and CS 28°C. While it was determined a significant increase in

the levels of POD the CE 18°C group compared with the E 18°C group and the CE 28°C group compared with the E 28°C group *(P*<0.05), was decreased significantly the S 28°C group according to the CS 28°C group (p< 0.05).The mean of standard derivations of groups respectively, 2.97±1.20 and 4.45±0.75; 2,87 ± 0,57 and 3,77 ± 0,32; 2.37±0.94 and 4.03±0.58) in Fig 4. The CAT values were not significant in any groups in the same temperature in Fig 5.

According to the effect of thermal stress, the levels of MDA, while there were no different significantly among exercise groups, among L-carnitine-exercise groups, the levels of MDA of CE 18°C group increased more than the CE28°C and the CE38°C group. SOD levels decreased a significantly the E 38°C group compared with the E 18°C group and the E 28°C group (p< 0.01). GR levels, the E18°C and the E38°C group increased significantly according to the E 28°C group (p< 0.05). CAT levels are not significant both exercise groups and L-carnitine-exercise groups in different temperature in Tab.1.

4. Discussion

In this study was aimed that at the rats are made acute swimming exercises at different water temperatures is determined the effect of carnitine and thermal stress on the free radical accurance and antioxidant, no different significant in the L-carnitine-exercise and exercise groups took part in the same temperature at serum MDA level (fig 1). The SOD levels of 38°C L- carnitine exercise group is significant than 38°C exercise group (P<0.05) (fig. 2). GR levels decreased significantly the CE 18°C than the E 18^{o}C group (*P*<0.05) (fig. 3).

The POD levels of 28°C L-carnitine exercise group was higher than 28°C exercise group (P<0.05). The POD levels of 28°C L-carnitine- sedentary group increased significantly compared with the 28°C sedentary group (fig.4).

L-carnitine is a essential subject which supplies transportation of fat acids long-chain from stoplasma to mitochondria that is known as energy stocks for cells (C.J. Reouche, 1996, W.O.Hulsmann, A.Peschechera E.Martelli, 1994). It increases the general metabolic activity (T.M.Hagen, J.Liu, J.Lykkesfeldt, C.M.Wehr, T.Russell, I.V.Vinarsky, J.C.Bartholomew, 2002) by developing mitochondrial functions. Besides, L-carnitine prevents oxidative stress, the cellular respiratory and enzym activities protects versus oxidative damage, and regulate the nitric oxidation (D.S. Sachan, N.Hongu, M. Johnsen., 2009). L-carnitine is an antioxidant, and it prevents accumulating end product of lipid oxidation (Gülçin, İ., 2006). It is a tricarbondialdehid which has been produced by the dissuasion of multiple unsaturated fat acids being reacted to malondialdehid (MDA) peroxidation which is the lost combination of lipid peroxidation (B.E.Kurutaş, G.F.İnanç M.Kılınç 2004, G. Cighetti, L.Duca, L. Bortone, S. Sala, I.Nava, G.Fiorelli, M.D.Cappellini, 2002). (K. Karanth, K. Jeevaratnam, 2005) recorded that it helped the lipid peroxdation and prepared protection against oxidative destructions regulating the distribution of blood in L-carnitine supplement exercise and the GSH in the muscles, blood and liver at the trained rats in a period of six montly. (P.Rajasekar, CV.Anuradha, 2007). Found out that the external L-carnitine increased the insulin sensivity and decreased lipogliko toksitite and oxidative destruction in the skeleton muscles at the rats which are fed by fruktoz in their studies (J.S.Volek, W.J.Kraemer, M.R.Rubın, A.L.Gomez,N.A. Ratamess, and P.Gaynor, 2002) reported in their studies that the serum MDA level significantly increased after the resistance exercises to the while body, the MDA level reached the pre-exercises level in 15 minutes in the group where carnitine was realized and the MDA level decreased to the normal values in 180 min in the placebo group.

Being different from these studies the acute exercise may be the reason of so much influence of L-carnitine on MDA. Because, numerous studies in literature were stated that the realization of L-carnitine was not put given any positive result so for during acute exercise. (P. Colombani, C.Wenk, I.Kunz, S. Krahenbuhl, M.Kuhnt, M. Arnold, P.Frey-Rındova, W. Frey, W.Langhans, 1996) determined that acute L-carnitine was not raised the running performance before and during long-run (20km. marathon). (Nuesch R, Rosetto M, Martına B., 1999) reported that 1g. of L-carnitine that was taken before and after the exercise made at the treadmill didn't improve the maximum exercise performance as well.

In our study the parameters of SOD, GR, POD and CAT were determined as the sign of the antioxidant system. While at the exercise group raised the GR level at hypothermic condition, at the L-carnitine groups increased SOD and POD levels. It can be said that L-carnitine is only influential on POD and SOD. In the some studies, L-carnitine was defined as an antioxidant which prevents the gathering of the last production of lipid oxidation (Fabriello RG, Calabrese F., 1988).

Namely, In the other study it was reported that L- carnitinee was turned the changes happend in the brain at old rats upside down, as an antioxidant (S. Kumaran, B.Deepak, B.Naveen, C.Panneerselvam 2003). Findings in another study stated that the supplements of L-carnitine (2g/ day) has reduced free radical occurrence and tissue destruction and the purine production before and after the mild squat exercise (J.S.Volek, W.J. Kraemer, M.R.Rubın, A.L.Gomez, N.A. Ratamess and P. Gaynor, 2002). L-carnitine has also protective influence on the 3-nitropropionic acid (3-NPA) induced neurotoxicity which increased by hypothermia (Z.C.Binienda, S.F.Ali, 2001). Although the studies which show the influence of L-carnitine related with hot and cold environment are few, the findings of this study support the findings of other studies. So, in this study, it can be said that the hypothermic conditions have given on additional lead to the metabolism in the CE 18ºC group and it

increased the use of fat acids during acute aerobic swimming exercises.

The increase of the POD level in advance of the L-carnitine groups in the sedanter groups may result the influence of L-carnitine antioxidant. (Sachan DS, Hongu N, Johnsen M., 2005) reported that choline and carnitine supplementation reduced oxidative stress, and the mild exercise regimen was not a deterrent to this outcome in humans. (J.D.Robertson, R.J.Maughan, G.G.Duthie, P.C.Morrice,1991) found out that the MDA values are higher in sedentary after the acute exercises in their study they made on twenty runners who make six sedentary and different exercises. In another study, it was stated that the increase of GSH, GSSD is related with LDL hydroperoxides and MDA decreases and 8-epi PGF_2 α decreases (L.Tesoriere, D.Butera, A.M.Pintaudi, M.Allegra, M.A.Livrea, 2004). These findings seem to be similar to our study.

On the other hand, at the rats swimming at 18°C, 28°C and 38°C, in terms of thermal stress influence, the MDA levels did not shown significantly differences among exercise groups (18,28, 38°C). It increased other much more in the 18°C L-carnitine-exercise than in the 28 and 38°C group ($P<0.05$). There is not so much differences at the SOD levels in the 18°C and 28°C exercise groups where as both groups are quite bigger in terms of SOD levels than the 38°C exercise groups ($P<0.01$). The GR levels in the 28°C exercise group reduced much more than the 18°C-38°C groups($P<0.05$). Although in the 18°C-28°C groups there is only a slight difference among the POD levels, the POD levels have been recognized quite high between these two groups the 38°C exercise group ($P<0.05$, table 1). Due to thermal temperature and ischemi-reperfuzyon tissue destruction may happen during sportive activities. Scientists of sports have explained the reason of the ROT production took place during the sportive activities with the chain of mitokondriyal electron transfer, the ksantin oxidaz system, reactions with metal catalizör and active nötrofillers (J.Peake, K.Suzuki, 2004). Although the reactive oxsygen types (G.Cohen, R.Heikkila., 1974) have been related with some physiology- biochemical events such as O_2 consumption, lactic acid production (H.B.Demopoulos, J.P.Santomier, M.L.Seligman, 1986) and hyperthermia (T.Matsuzuka, N.Sakamoto M.Ozawa, A.Ushitani, M.Hirabayash, Y.Kanai, 2005) , in literature, the relation between them have not been completely yet (L.L. Ji, R.G. Fu, E.W. Mitchell., 1992).

The literary knowledge related with the influence of L-carnitine on the exercises made in hypothermic and hyperthermic condition is limited. There is a few information about the regulation of energy metabolism and cardiac function of the hibernating animals in hipotermic conditions. Darel and et al. reported that the energy matabolism increases in the rat heart during hypotermia regardless off cardiac work on their study (D.D.Belke, L.C.H. Wang, G.D.Lopaschuk, 1997). Events such as diet with low carbohydrate, high fat, long exercise, starving, extreme cold and insufficient sleeping lead to deformation especially in sceleton muscules increasing fat acid oxidation and causing carnitinee palmitoyl-transferase enzyme deficiency (CPT II) (A. Gentili, E. Lannella, F. Masciopinto, ME. Latrofa, L. Giuntoli, S. Baroncini., 2008). The effect of carnitine supplement changes depending on the duration and type of exercise, generate of the experiment, duration and amount of dose, and its permenant steady use (M. Shafi, 1998). Although the amount of L-carnitine we have used is enough under normal exercise conditions, it may be insufficient to reduce the MDA level in the negative conditions of hipotermic environment.

In literature there are studies of the same opinion that hypothermic conditoin created more stress . Osorio et al.emphasized that they reached the highest TBARS at 39°C in thermal stress situation in their study on pregnant rats (R.A.L. Osorio, J.S. Christofani, V.D. Almeida, A.K. Russo, I.C. Picarro., 2003). In rats, reactive oxygen types increase heart, skeleton muscle, plasma during exercise, and it stimulates the antioxidant mechanism (S. Kumaran, B. Deepak, B. Naveen, C. Panneerselvam, 2003). It is an important reactor against thermal depression antioxidant defence mechanism on trained animals (R.A.L. Osorio, J.S. Christofani, V.D. Almeida, A.K. Russo, I.C. Picarro, 2003). In this study the difference of SOD, POD and GR levels among the heat groups proves it.

(R.A.L. Osorio, J.S. Christofani, V.D. Almeida, A.K. Russo, I.C. Picarro, 2003). Examined that the metabolic response to exercise doesn't change under thermal stress on pregnant rats. Furthermore, they recommended avoiding hot water as it would be dangerous for the baby when the mother is under extreme hot and cold stress and would be hazardous for the fatal development at water temperature while swimming although the metabolic responses continue. In this study, the ineffectiveness of temperature differences in L-carnitine-exercise groups in terms of antioxidant levels show that the effects of L-carnitine increase in hypothermic and hyperthermic situations. In a study it has been claimed that when met with standard antioxidants which are natural antioxidant such as α-tocoferol, the L-carnitine activities are effective antioxidants in strength decreasing of different in vitro evaluations such as combination with metals, cleaning of hydrojen peroxide, removing superoxide anyone and DPPH radicals (I.Gülçin, 2006).

Consequently, in this study in which the effect of carnitine has been researched according to different water temperatures, it has been thought that, the significantly increase of the MDA level in hypotermic situation in the carnitine group according to the effect of thermal stress, is related with the additional load on metabolism caused by hypotermic conditions and the increase in utilization the fat acids during swimming exercises. The increase of SOD, POD and CAT levels in favour of L-carnitine between the sedanter group and L-carnitine sedanter group reflects the positive effect of L-carnitine on oxidative stress without being

under any stress (heat or exercise). Providing additional carnitine in increasing the antioxidant levels in the organism especially against the harmful effects us oxidative stress under thermal stress may be useful for athletes. However, It has been considered that it would be useful in experiencing this practive in both in the vitro and in the vivo studies in long duration endurance exercise under thermal stress. It can be taken into consideration that the acute exercise may be restrictively useful to provide a clear result under thermal situation.

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Table1: Effect of thermal stress on values of MDA, SOD, GR, POD and CAT in exercise and L-Carnitine -exercise groups at different water temperature.

		Exercise Groups		L-Carnitine–Exercise Groups	
Parameter	**Temperature**	**Mean ±S.D.**	**P**	Mean ±S.D.	P
MDA (nmol/ml)	18°C	0,42 ± 0,24	**0.402**	0,43 ± 0,10 [b]	**0.019***
	28°C	0,32 ± 0,17		0,26 ± 0,09 [a]	
	38°C	0,27 ± 0,07		0,23 ± 0,13 [a]	
SOD (EU/ml)	18°C	13,08 ± 3,54 [a]	**0.002****	10,61 ± 1,41	**0.947**
	28°C	10,18 ± 1,40 [a]		10,66 ± 2,90	
	38°C	6,96 ± 0,88 [b]		10,2 7± 2,04	
GR (Eu/gHb)	18°C	0,31 ± 0,07 [a]	**0.012***	0,21 ± 0,07	**0.146**
	28°C	0,17 ± 0,09 [b]		0,21 ± 0,03	
	38°C	0,28 ± 0,04 [a]		0,27 ± 0,05	
POD (EU/gHb)	18°C	2,97 ± 1,20 [b]	**0.012***	4,45 ± 0,75	**0.338**
	28°C	2,87 ± 0,57 [b]		3,77 ± 0,32	
	38°C	4,57 ± 1,26 [a]		4,23 ± 1,09	
CAT (Eu/gHb)	18°C	282,24±71,32	**0.519**	293,72±58,67	**0.949**
	28°C	241,06±81,08		276,58±88,67	
	38°C	311,86±146,57		280,20±128,29	

*P<0.05: significantly difference beetwen a>b **P<0.01(in exercise groups) Significantly difference beetwen a>b (in exercise groups). ***P<0.05: significantly difference beetwen b>a (in L-Carnitine and exercise groups).

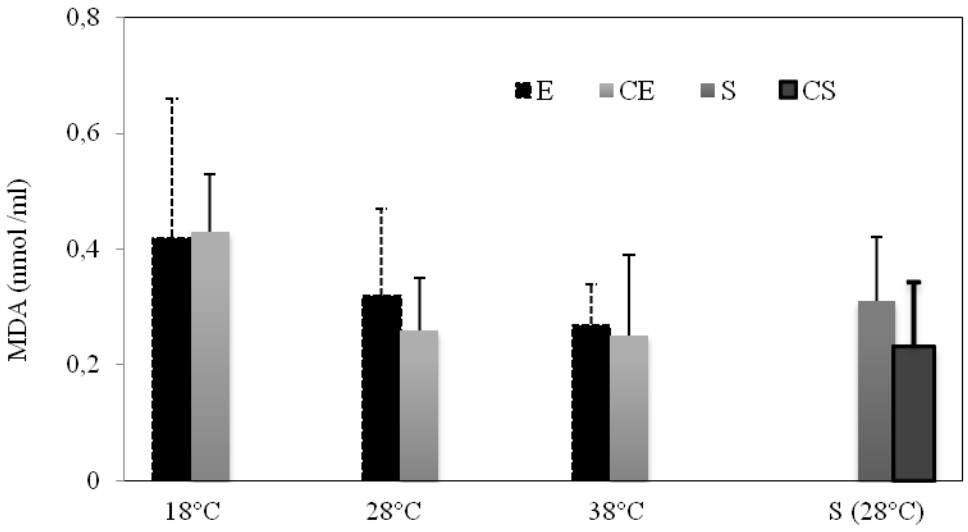

Figure 1.

Figure 1. Effect of L-carnitine on **MDA** levels in exercise and L-carnitine-exercise groups situated the same temperature. **E**, exercise groups; **CE**, L-carnitine-exercise groups; **S**, sedentary groups; **CS**, L-carnitine-sedentary groups. No significant differences between the groups took place in the same water temperature (*P*>0.05).

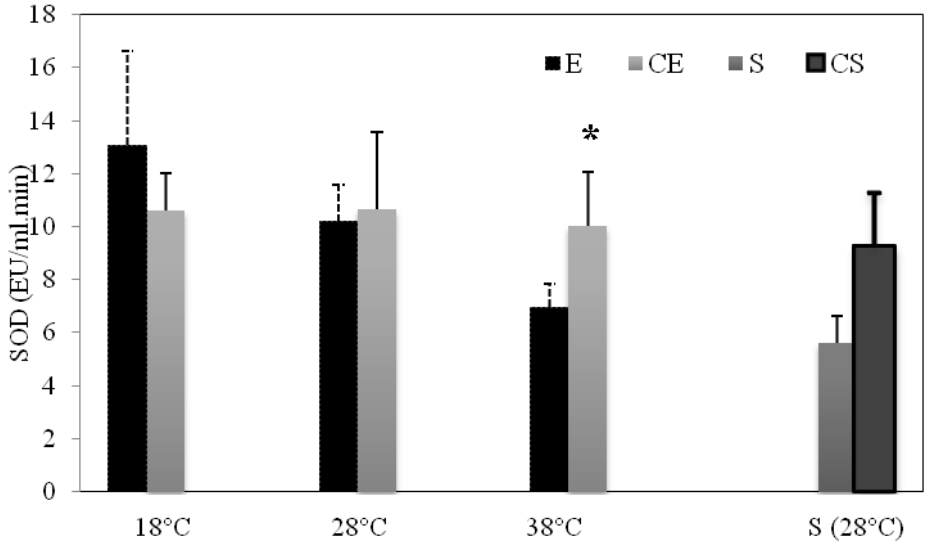

Figure 2

Figure 2. Effect of L-Carnitine on **SOD** levels in exercise and L-carnitine-exercise groups situated the same temperature. **E**, exercise groups; **CE**, L-carnitine-exercise groups; **S**, sedentary groups; **CS**, L-carnitine-sedentary groups. (**P*<0.05), CE 38°C significantly different than E 38°C.

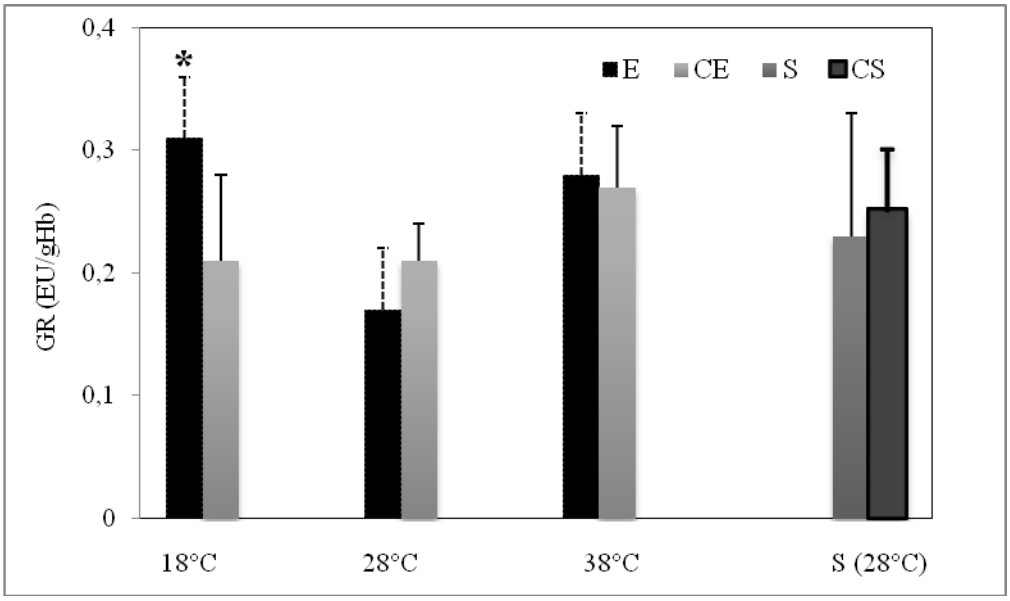

Figure 3

Figure 3: Effect of L-Carnitine on **GR** levels in exercise and L-carnitine-exercise groups situated the same temperature. **E**, exercise groups; **CE**, L-carnitine-exercise groups; **S**, sedentary groups; **CS**, L-carnitine -sedentary groups. (**P*<0.05), 18°C E significantly different than CE 18°C.

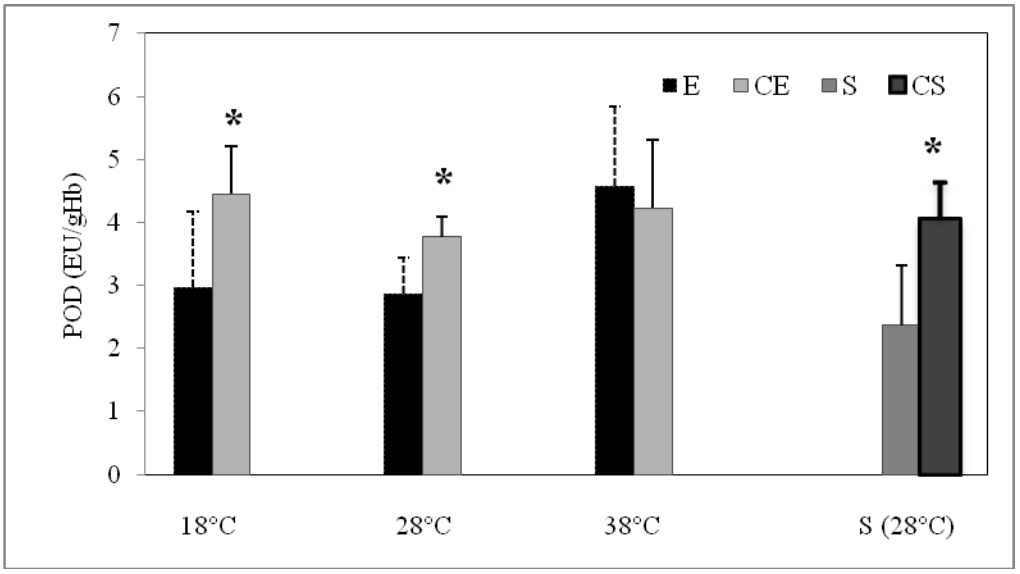

Figure 4

Figure 4: Effect of L-Carnitine on **POD** levels in exercise and L-carnitine-exercise groups situated the same temperature. **E**, exercise groups; **CE**, L-carnitine-exercise groups; **S**, sedentary groups; **CS**, L-carnitin-sedentary groups. (**P*<0.05), E 18°C significantly different than CE 18°C, E 28°C significantly different than CE 28°C, S significantly different than CS.

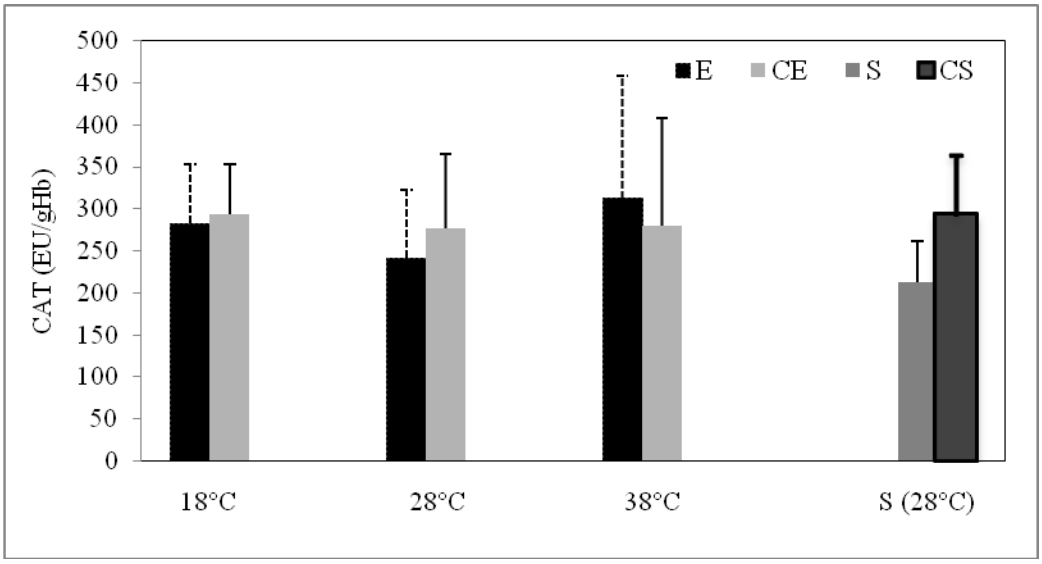

Figure 5

Figure 5: Effect of L-Carnitine on **CAT** levels in exercise and L-carnitine-exercise groups situated the same temperature. **E**, exercise groups; **CE**, L-carnitine-exercise groups; **S**, sedentary groups; **CS**, L-carnitin-sedentary groups. No significantly differences between the groups took place in the same water temperature (*P*>0.05).

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EFFECT OF MELATONIN AND ENVIRONMENTAL STRESS ON FREE RADICALS AND ANTIOXIDANT LEVELS IN RATS DURİNG THE EXERCISE AT DIFFERENT ROOM TEMPERATURES.

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Abstract

Melatonin has a lipophilic property and is produced in a variety of organs including the pineal gland. It possesses several physiological properties that may play an important role in physiology and pathophysiology. Eight groups (E 10°C, E 23°C and E 37°C chronic treadmill exercise groups; ME 10°C, ME 23°C and ME 37°C melatonin chronic treadmill exercise groups; S 23°C and MS 23°C sedentary and melatonin-sedentary groups respectively) were formed and a total of 48 Sprague Dawley male rats, weighing 250-300 g were used in this study. In the study, the groups which took melatonin were given the related substance 5 mg/kg per day before the exercise for 4 weeks by intraperitoneally (I.P.) way. At the end of the training period (4 week) the rats were killed. Blood samples were collected for antioxidant and lipid peroxidation levels determinations. In the statistical analyses Anova, Duncan and *t*- test were used. MDA, GR levels are higher than those of ME23°C groups. GR level is higher in E10°C group compared to ME 10°C group. Serum MDA levels of the E 37°C group are lower than those of ME37°C group. Serum SOD levels are the same in E 23°C and E 37°C groups, SOD levels of both of then are lower than those of the E 10°C group. SOD levels in the sedentary and the other melatonin-sedentary group were significantly different. It was found out in the study that oxidative stress appeared most in cold environment, melatonin did not prevent oxidative stress in cold and hot environment but it activated antioxidant system and decreased emergence of free radicals at normal temperatures.

Keywords: Melatonin, rat, environmental stress, antioxidant enzymes, lipid peroxidation.

1. Introduction

Melatonin (N-acetyl-5-methoxytryptamine), the main hormone of the pineal gland, has ubiquitous actions as a direct as well as an indirect antioxidant, free radical scavenger and metal chelating effect (I.Gulçın, M.E.Buyukokuroglu, M.Oktay, 2002, Das A, A.Belagodu, R.J.Reıter, S.K.Ray, N.L.Banık, 2008), also, other organs and tissues including retina, gut, ovary, testes, bone marrow and lens have been reported to produce melatonin as well (D.X.Tan, L.C.Manchester, R.J.Reıter et al., 1999). Once formed melatonin is not stored within the pineal gland but diffuses out into the capillary blood and cerebrospinal fluid (J.Zhou, S.Zhang, X.Zhao, T.Weı, 2008). Besides directly detoxifying a variety of highly reactive molecules, melatonin also stimulates antioxidant enzymes (R.Hardeland, C.Backhaus, A.Fadavı, 2007).

Melatonin is known to influence a variety of biologic processes including the control of seasonal reproduction, circadian rhythms, influences the immune system, neuroendocrine, cardiovascular, and immune functions as well as thermoregulation (Gulçın I, Buyukokuroğlu ME, Kufrevıoğlu OI., 2003, Beydemır Ş, Gulçın I., 2004, Gulçın I., 2008). Melatonin and its metabolites show potent antioxidant ability both in vitro and in vivo, and they scavenge hydrophilic and hydrophobic reactive oxygen species (ROS) (D.X.Tan, L.C.Manchester, M.P.Terron et al., 2007). Additionally, this molecule functions in protecting cell components such as nuclear DNA, membrane lipids, and cytosolic proteins from free radical damage (R.J.Reıter, L.Tang, J.J.Garcıa, et al., 1997, S.J.Kım, R.J.Reıter, W.Qı et al., 2000).

Physical exercise is well known to be associated with cellular activation of the blood cells (F.C.Mooren, K.Volker, 2001). It was reported that by helping the regulation of energy metabolism, melatonin reduces the use of liver glycogen after exercise by increasing the liver glycogen stores in rats where exercise is done (C.D.N.B. Silva, T. Julie, Alonso-Vale Mic, et al., 2007). The influence of exercise on melatonin secretion is still a subject of intense research. In many researches melatonin secretion was explained in response to exercise since noradrenalin is necessary for at the control of increasing catecholamine secretion and melatonin synthesis during the physical exercise (A. Altun, M. Yaprak, M. Aktoz, et al., 2002, G.Gerra, I.R.Caccavar, N.Reali, et al.,1993).

A resent research in human has indicated that melatonin levels increase because of stress after exercise in long distance runners (Lopez BD, Urquijo C., 2007). Another research showed that there was no significant change in melatonin levels in the blood samples collected before exercise, during and after exercise (A.K.Baltaci, B.Cumraligil, M.Kilic et al.,2007).

Injuries in cold and hot environment (heat stroke, exhaustion, frostbite) are state that occurs during exercise. Exercise sustained at a sufficient intensity and duration may elevate core body

temperature to the upper limit of its thermoregulatory zone (T. Reilly, B. Drust, W.Gregson, 2006). Strategies which tend to reduce the body temperature before the exercise provides an important limit without reaching the body temperature vitally and make performance improve. Such improvements are shown with the reduction in body temperature by using pre-cooling maneuver before exercise (F.E.Marino, 2002).

In view of these observations, the aim of this study was to investigate the effects of melatonin on the antioxidant and lipid peroxidation levels in rats which exposed to environmental stress, such as exercise training at cold and hot conditions.

2. Material and methods

2.1. Chemicals

Melatonin, Nitroblue tetrazolium (NBT), xanthine, xanthine oxidase, oxidized glutathione, thiobarbituric acid (TBA), NADH and ABTS were obtained from Sigma company(Sigma-Aldrich GmbH, Sternheim, Germany). Ammonium thiocyanate was purchased from Merck. Trichloroacetic acid (TCA) and the other chemicals used were of analytical grade and obtained from either Sigma-Aldrich or Merck.

2.2. Animals and groups

In this study, 48 healthy Sprague Dawley male rats, weighing 250-300 g, 4-6 months of age, were provided from Fırat University Experimental Animal Research Center (FUDDAM). The study was carried out in Atatürk University Research Center of Experiment Animals and the study was approved by the Ethical Committee of the Atatürk University (AUHADYEK, Ethical Committee Report No: 2008-51). All surgical procedures and protocols used here were in accordance with Guidelines for Ethical Care of Atatürk University Research Center of Experiment Animals.

The rats were kept under special conditions and were sheltered in cages, each of which has 6 rats, at the room temperature (25°C). The food (Bayramoğlu Yem Sanayi, Erzurum, Turkey) and water were supplied for 12-hour day and night cycles. The rats were divided into eight equal groups. The groups which took melatonin were given the related substance 5 mg/kg per day before the exercise for 4 weeks as intraperitoneally. Body weights were measured weekly.

E 10 (Exercise, 10°C): The chronic treadmill exercise group in a laboratory at 10°C.

E 23 (Exercise, 23°C): The chronic treadmill exercise group in a laboratory at 23°C.

E 37 (Exercise, 37°C): The chronic treadmill exercise group in a laboratory at 37°C.

ME (Melatonin - Exercise, 10°C): The chronic treadmill exercise group with melatonin at pharmacological dosage (5 mg/kg) in a laboratory at 10°C.

ME (melatonin-exercise, 23°C): The chronic treadmill exercise group with melatonin at pharmacological dosage (5 mg/kg) in a laboratory at 23°C.

ME (melatonin-exercise, 37°C): The chronic treadmill exercise group with melatonin at pharmacological dosage (5 mg/kg) in a laboratory at 37°C.

S (sedentary, 23°C): The sedentary group on which no application was employed at 23±2°C (the control group).

MS (melatonin-sedentary, 23°C): This sedentary group used only melatonin and had not exercise at 23±2°C.

The groups which took melatonin were given the related substance 5 mg/kg per day before the exercise for 4 weeks intraperitoneally.

Exercise Protocol

The same exercise programs were applied to exercise and melatonin exercise groups in test groups. During the test, digital thermometer (GEMO, micro software and PID thermo controlled device) was used.

Adaptation Training: For the rats to have adaptation they were made to have exercise on treadmill for 10-15 min, at 20 m/min during per week (MAY TME 9805 treadmill exerciser, Commat Ltd., Ankara, Turkey). Adaptation training was made at 23°C laboratory temperature.

Loading Training: The exercise groups (n:36) were made to endurance training in laboratories at 10^{o}C, 23^{o}C and 37^{o}C. The exercise was done 6 days a week during 4 weeks. Endurance training was gradually increased training of speed and time during four weeks. A standard mild electric shock deterrent was used intermittently when necessary to coerce the rats to run. The physical training program was performed for 4 week as described in Table 1. At the end of the fourth week, rats were killed by decapitation on each training day, laboratory temperatures were regulated in accordance with exercise group temperatures (10, 23 and 37°C).

Determination of temperatures

American Health Assembly (AHA) approved normal body temperature as 36.5-37.2°C. A naked person can keep body inner temperature fixed between 12.5°C and 55°C in dry weather (SIKTAR E., 2009). For the body to feel the heat depends on the temperature of the weather, moisture rate and wind rate (FOX BOWERS FOSS., 1988). During exercise body metabolism increases 20-25 times. Unless heat loss mechanisms (radiation, conduction, convection and evaporation) function, body inner heat increases 1-1.8°C every 5 minutes and 75-90 Kcal of temperature is produced [20]. In this study the temperatures were regulated in accordance with the room temperatures at which humans and rats live (22-23°C). Moisture rate was taken into consideration and 10°C was accepted hypothermic, 37°C hiperthermic. We determined in pre-studies that the rats had difficulty under and over these temperatures. The rats tolerated up to +4°C.

Drawing of blood

Venous blood was drawn from the vein portae into a sterile plastic syringe (10 mL) using a sterile

needle. Half of the drawn blood (5 mL) was added to a plastic test tube containing 50 µL of heparin (1:100) to be used for the antioxidant enzymes assay, and the other 5 mL of drawn blood was added to a glass vacationer containing 15% EDTA (0.054 mL/4.5 mL) to be used for MDA levels.

2.4. Preparation of Hemolysate

Erythrocytes were isolated from fresh rat blood, which was obtained from the University Hospital Blood Centre following low-speed centrifugation at 1500 rpm for 15 min (MSE, MISTRAL 2000) by removal of plasma and buffy coat. The red cells were washed twice with 0.9% w/v NaCl and hemolysed with 1.5 volumes of ice-cold water. Ghost and intact cells were then removed by high speed centrifugation at 20000 rpm for 30 min (Heraeus Sepatech, Suprafuge 22) at 4°C.

2.5. Hemoglobin Estimation

The hemoglobin (Hb) concentration in hemolysate was determined by the cyanmethaemoglobin method. All studies were performed at +4°C (OLCAY H, BEYDEMIR Ş, GULÇIN I, et al., 2005).

2.6. Antioxidant Enzymes Activity Assays

SOD activity

SOD activity is one of the most important indicators of tissue antioxidant capacity. SOD activity determination was performed in the samples before and after adding trichloroacetic acid (TCA, 20%), as described (DURAK I, ANBOLAT O, KACMAZ M, et al., 1998). In this method, xanthine-xanthine oxidase complex produces superoxide radicals that react with nitroblue tetrazolium (NBT) to form a formazane (NBT^{2+}) compound. SOD activity is measured at 560 nm by detecting inhibition of this reaction. By using blank reactions in which all reagents are present except the supernatant sample and by determining the absorbance of the sample and blank, SOD activity is calculated (DURAK I, CANBOLAT O, KACMAZ M, et al., 1998).

Catalase activity

Catalase activity was assayed by monitoring the decrease in absorbance at 240 nm due to H_2O_2 consumption according to the method of (AEBI H., 1984). The reaction mixture contained 25 µL hemolysate, 0.5 mL 10 mM H_2O_2 and 0.9 mL 30 mM potassium phosphate buffer (pH 7.3). The decrease in absorbance was recorded at 240 nm for 60 sec. Enzyme activity was expressed as µmoles H_2O_2 decomposed by using the H_2O_2 extinction coefficient 36 $\mu M^{-1}cm^{-1}$ (ARASHISAR Ş, HISAR O, BEYDEMIR Ş, GÜLÇIN İ. et al., 2004).

Peroxidase activity

Peroxidase activity was measured by the method of Shannon et al. (SHANNON LM, KAY E., LAW JY. 1996). For this purpose, 0.1 mL hemolysate was taken up into potassium phosphate buffer (1.7 mL, 0.05 M, pH 7.3). Then 0.5 mL ABTS was added. The reaction was started by addition of H_2O_2 (0.2 mL, 0.2M). Change in absorbance at 470 nm was recorded for 2 min at intervals of 15 sec. The enzyme activity was expressed as enzyme unit.$min^{-1}gHb^{-1}$ (ARASHISAR Ş, HISAR O, BEYDEMIR Ş, GÜLÇIN İ. et al., 2004).

Glutathione Reductase Activity

Glutathione reductase activity was estimated by the method of (GOLDBERG D.M, SPOONER RJ., 1983). To 0.1 mL hemolysate 2.5 mL 120 mM potassium phosphate buffer (pH 7.3), 0.1 mL 0.015 mM EDTA and 0.1 mL 0.065 mM oxidized glutathione were added. After 5 min, 0.05 mL 9.6 mM NADH were added and mixed. The absorbance was recorded at 340 nm at intervals of 15 sec. The enzyme activity was expressed as nmole NADH oxidized $min^{-1}.gHb^{-1}$ protein using the molar extinction coefficient 6.23 $\mu M^{-1}cm^{-1}$. (ARASHISAR Ş, HISAR O, BEYDEMIR Ş, GÜLÇIN İ. et al., 2004).

Determination of MDA

MDA concentrations in blood plasma samples were measured by the high-performance liquid chromatography with fluorescent detection (HPLC-FLD). Briefly 50 µL of plasma sample was mixed in (0.44 M) H_3PO_4 and (42 mM) tiobarbituric acid (TBA), and incubated for 30 min in a boiling water bath. After rapidly cooling on ice, an equal volume alkaline methanol was added to the sample, vortex, centrifuged (3000xg for 3 min), and the aqueous layer was removed.

Then, 20 µL supernatant was analyzed by HPLC (HP, Agilent 1100 modular systems with FLD detector, Germany): Column, RP-C18 (5 µm, 4.6 x 150 mm, Eclipse VDB-C18. Agilent) elution, methanol (40:60, v/v) containing 50 mM KH_2PO_4 buffer (pH 6.8) flow rate 0.8 mL/min. Fluorometric detection was performed with excitation at 527 nm an emission at 551 nm. The peak of MDA-TBA adduct was calibrated a TEP (1,1,3,3-tetraethoxypropane) standard solution preceded in exactly the same as plasma and urine sample (KHOSCHSORUR GA, WINKLHOFER-ROOB BM, RABL H, et al., 2000).

2.7. Statistical Analysis

The experimental results were performed in triplicate. The data were recorded as mean ± standard deviation and analyzed by SPSS (version 11.5 for Windows 2000, SPSS Inc.). One-way analysis of variance ANOVA was performed by procedures. Significant differences between means were determined by Duncan's Multiple Range tests, and $p<0.05$ was regarded as significant, and $p<0.01$ was very significant.

3. Results

Melatonin caused a significant increase in the MDA levels of the E 23°C group compared with the ME 23°C group *(P*<0.05), and the ME 37°C group, compared with the E 37°C group *(P*<0.05) (The mean of standard derivations of groups respectively, 0.45±0.08 and 0.26±0.13; 0.29±0.06 and 0.45±0.09). There was no difference between the E 10°C group and the ME 10°C group and between the S 23°C group and the MS 23°C group in Fig.1.

The SOD values for serum increased significantly in the ME 23°C group according to the E 23°C group (P<0.05) and the MS 23°C group according to the S 23°C group (P< 0.001). The mean and standard deviation of ME 23°C and E 23°C groups was determined respectively as 6.56±0.778 and 8.26±1.06, and E 23°C and MS 23°C groups as 5.61 ± 1.04 and 9.34 ± 0.65. The SOD values were not different significantly between the others groups in Fig.2.

In Fig. 3, GR levels decreased significantly the ME 10°C than the E 10°C group (P<0.05) and the ME 23°C group than the E 23°C group (P<0.05). While values of ME 10°C and E 23°C groups were found as 0.39 ± 0.08 and 0.27±0.07, the values of ME 23°C and E 23°C groups were determined as 0.33±0.04 and 0.25±0.05. Not significant between E 37°C and ME 37°C and S 23°C and MS 23°C. POT and CAT values were not significant in any groups in the same temperature (Fig. 4 and 5).

According to the effect of heat stress, MDA levels of E 10°C group were significantly different from E 23°C group and E 37°C group. E 23°C group was significantly different from E 37°C group. Also, SOD levels increased a significant E 10°C group compared with E 23°C group and E 37°C group. MDA levels, ME 10°C group increased significantly according to ME 23°C group and ME 37°C group, and ME 23°C group decreased from ME 37°C group. GR, POD and CAT levels is not significant both exercise groups and melatonin-exercise groups in different temperature in Tab.2.

4. Discussion

The aim of this study was to investigate the effects of environmental stress like prolonged training on antioxidant and lipid peroxidation levels. According to the effect of melatonin, the highest MDA levels were obtained in 23°C exercise group and 37°C melatonin-exercise group in the present study (Fig.1). SOD level increased in 23°C melatonin-exercise group, and GR level increased significantly in 23°C and 10°C exercise groups (Fig 2 and 3).

During the normal aerobic, mechanism form reactive oxygen species (ROS) such as superoxide anion and hydroxyl radical in the body (Y.J. Kim, J.E. Chung, M.Kurisawa, H.Uyama, et al., 2004). Physical activity increases the generation of reactive oxygen species in several ways. As oxidative phosphorylation increases in response to exercise, Catecholamines that are released during exercise, including prostanoid metabolism, xanthine oxidase, NAD(P)H oxidase, and several secondary sources, such as the release of radicals by macrophages recruited to repair damaged tissue, there will be a concomitant increase in free radicals (J.Peake, K.Suzuki, 2004, M.L.Urso, P.M.Clarkson. 2003). During exercise, tissue injury may result from muscle damage, thermal stress and ischaemia/reperfusion. When produced in excess, neutrophil-derived ROS may overwhelm the body's endogenous antioxidant defense mechanisms, and this can lead to oxidative stress observed that aerobic training decreased lipid peroxidation (levels of TBARS) under high intensity exercise regimes (J.Peake, K.Suzuki, 2004, F.Marzatico, O.Pansarasa, L.Bertorelli et al. 1997, M.M.Kanter , L.A.Nolte, J.O.Holloszy, 1993).

This study has indicated that SOD, increased particularly in cold environment, induced more oxidative stress according to the other temperatures (Price MJ, Campbell I.G. 2002), pointed out that continuous increases in aural temperature, skin temperature and heat storage were observed during exercise in warm conditions when compared with cool conditions, indicating an increased thermal strain during exercise, although the thermal stress remained constant.

The reason that not among melatonin groups is a significant may proceed from antioxidant effect of melatonin. Melatonin, released from the pineal gland had role for regulation of several biological functions such as sleep, reproduction, circadian rhythm and immune function (A.Brzezinski, 1997), cells and tissues protect against oxidative damage (A.Brzezinski , 1997, R.J.Reiter, 1993). Additionally, melatonin affects renal function, acting directly on water and electrolyte function (E.Skotnicka, A.J.Hynczak, 2001) preserve glycogen stores in exercised rats through the mediation of carbohydrate and lipid utilization (R.C.Mazepa, M.J.Cuevas, P.S.Collado, et al., 1999), and increase the exercise-induced secretion of growth hormone in humans (D.R.Meeking, J.D.Wallace, R.C.CUNEO, et al., 1999). There have been some researches concerning the *in vitro* and *in vivo* antioxidant properties of melatonin (M.Koç, S.Taysi, M.E. Buyukokuroğlu, N. Bakan. 2003, S.TAYSI, H.Ucuncu, M.Elmastas, et al. 2005, R.J.Reiter, L.Tang, J.J.Garcia et al**.** 1997), It was observed that the function of melatonin removing hydroxyl radical stronger 5 times than glutathione and 15 times than mannitol, and that the function of its scavenger peroxide radical stronger 2 times more than vitamin E (R.J.Reiter, 1996). However, its antioxidant and anti-inflammatory effect have not been searched in exercise performance.

The ergogenic effect of melatonin is limited on exercise performance in literature. Mclellan et al. (TM Mclellan, IF Smith, GA Gannon, et al., 2000), investigated the effect of 2x1 mg doses of melatonin on the thermo-regulatory responses and tolerance time to intermittent treadmill walking at 3.5 km/h in a environment chamber at 40°C, and concluded that this low dose of melatonin had no impact on tolerance to uncompensable heat stress and that trials conducted in the early afternoon were associated with an increased rectal temperature tolerated at exhaustion that offset the circadian influence on resting rectal temperature and thus maintained tolerance times similar to those of trials conducted in the morning. In another study, McClellan et al. (R.A.L. Osorio, J.S. ChristofanI, VD Almeida et al., 2003) examined the effect of 5 mg dose

of melatonin induced a lower rectal temperature response at rest in both a cool (at 23°C) and hot environment (at 40°C).They reported that the small decrease in rectal temperature following the ingestion of 5 mg of melatonin at rest in a cool environment had no influence on subsequent tolerance during uncompensable heat stress.

In results of this study, while it has useful effect of melatonin in normal temperature, increasing in MDA levels has been thought to have a negative effect in hot environment. A research suggest that hyperthermia in sedentary rats presents smaller effect over lipid peroxidation than hypothermia (Osorio RAL, ChristofanI JS, Almeida VD et al., 2003).

According to the effect of heat stress, both at 10°C exercise groups and at 10°C melatonin-exercise groups were attained in the highest of MDA levels (Tab. 1). These results indicated that in a cold environment occurred more stress than the other environment temperatures (at 23°C and 37°C). Exogenous melatonin administration has a clear hypothermic effect under resting conditions (A. CagnaccI, R. Soldani, C. Romoglono., 1994, C.V. Van Den Heuvel, D.C. Kennaway, D.Dawson, 1999). While (A.CagnaccI, J.A.Elliott, S.S.C.Yen, 1992), Cagnacci and co-workers determined that 2.5 mg dose of melatonin was reduced 0.3°C body temperature at rest on female, the other researches reported that 0.1, 0.3, 1 and 10 mg doses of melatonin were decreased the body temperature 0.12°C and 0.2°C respectively in individuals who were given 1 and 10 mg doses of melatonin (S.Aizawa, H.Tokura, T.Morita, 2002) and (Reid K, C.Van Den Heuvel, D.Dawson, 1996) examined the change of body temperature was 0.28°C (5 mg dose of melatonin). Also, it was conceived that cold exposures in dark significantly decreased melatonin levels in pineal glands and serum in quails (P.P.Lee, A.E.Allen, S.F.Pang, 1990).

There were some adverse researches reporting that melatonin increased in literature (T.M.Lee, W.G.Holmes, I.Zucker, 1990). Likewise, conclude that pharmacological doses of melatonin induce hypothermia in hens by increasing nonevaporative skin heat losses and slightly increasing respiratory evaporation in chicken (I.Rozenboim, L.Miara, D.Wolfenson, 1998).

With respect to this knowledge, it may be thought melatonin does not prevent the oxidative damage relating to that it fall off body temperature and decrease its quantity in cold environment. However, it has not known completely hypothermic effect of melatonin on exercise. Atkinson et al. declared that the administration of exogenous melatonin leads to hypnotic and hypothermic responses in humans, which can be linked to immediate reductions in short-term mental and physical performance (G.Atkinson, B.Drust, T.Reilly et al., 2003). These effects may still be apparent 3-5 hours after administration for some types of cognitive performance, but effects on physical performance seem more short-lived depending on the dose of melatonin. Furthermore, they stressed that the hypothermic effects of melatonin lead to improved endurance performance in hot environments is not supported by evidence from studies involving military recruits who exercised at relatively low intensities.

As a conclusion, it was found out in the study that oxidative stress appeared most in cold environment, melatonin did not prevent oxidative stress in cold and hot environment but it activated the antioxidant system and decreased emergence of free radicals at normal temperatures.

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Exercise week	Exercise time (min)	Exercise speed (m/min)
1	30	23
2	40	23
3	50	25*
4	60	25*

Table 1: The exercise was done 6 days a week during four weeks. Training of speed and time gradually increased during four weeks. *2% uphill gradient

	Exercise Groups			Melatonin –Exercise Groups	
Parameter	Temperature (°C)	Mean ± S.D.	P	Mean ±S.D.	P
MDA (nmol/ml)	10	0.78 ± 0.13[a]	0.000*	0.81 ± 0.12[a]	0.000***
	23	0.45 ± 0.08[b]		0.26 ± 0.13[c]	
	37	0.29 ± 0.06[c]		0.45 ± 0.09[b]	
SOD (EU/mL.min)	10	10.4 ± 1.73[a]	0.000**	9.12 ± 2.56	0.549
	23	6.56 ± 0.77[b]		8.26 ± 1.06	
	37	5.33 ± 0.79[b]		7.66 ± 2.40	
GR (Eu/gHb)	10	0.39 ± 0.08	0.110	0.27 ± 0.07	0.603
	23	0.33 ± 0.04		0.25 ± 0.05	
	37	0.30 ± 0.05		0.23 ± 0.04	
POD (EU/gHb)	10	1.83 ± 0.32	0.675	2.00 ± 0.32	0.328
	23	1.83 ±0.33		1.70 ± 0.36	
	37	1.99 ± 0.34		1.86 ± 0.24	
CAT (Eu/gHb)	10	274.84±42.44	0.060	249.56±62.85	0.243
	23	225.05±13.21		198.80±48.30	
	37	239.57±34.66		217.59±29.20	

Table 2: Effect of heat stress on values of MDA, SOD, GR, POD and CAT in exercise and melatonin-exercise groups at different temperature
*P<0.001: significantly differences in among a>b>c exercise groups. **P<0.001: significantly difference beetwen a and b exercise groups. ***P<0.001: significantly difference among a>c>b melatonin-exercise groups.

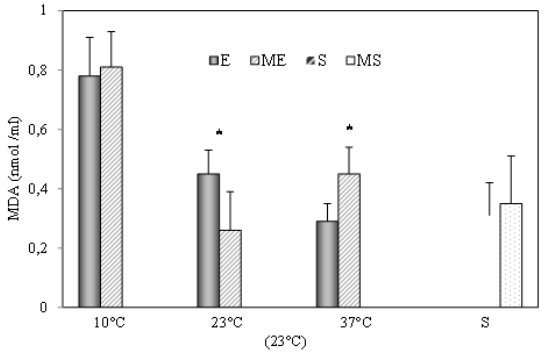

Figure 1.Effect of melatonin on MDA levels in exercise and melatonin-exercise groups situated the same temperature. (E, exercise groups; ME, melatonin-exercise groups; S, sedentary groups; MS, melatonin-sedentary groups.) (* *P*<0.05), significantly different E 23°C than ME 23°C and ME 37°C than E 37°C.

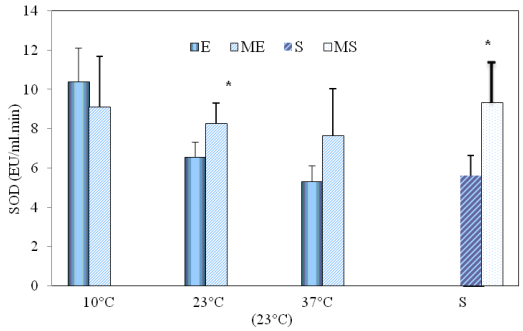

Figure 2. Effect of melatonin on SOD levels in exercise and melatonin-exercise groups situated the same temperature. (E: exercise groups, ME: melatonin-exercise groups, S: Sedentary groups, MS: Melatonin-sedentary groups.) (* *P*<0.05), significantly different ME 23°C than E 23°C and MS 23°C than S 23°C.

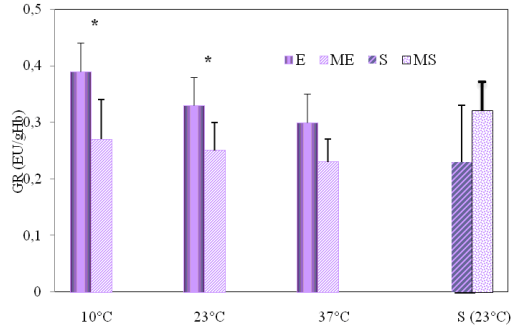

Figure 3: Effect of melatonin on GR levels in exercise and melatonin-exercise groups situated the same temperature. (E, exercise groups; ME, melatonin-exercise groups; S, sedentary groups; MS, melatonin-sedentary groups.) (*P<0.05), significantly different E 10°C than ME 10°C and E 23°C than ME 23°C.

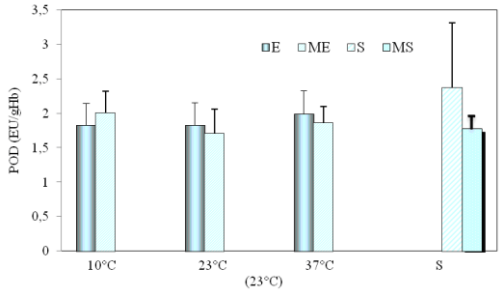

Figure 4: Effect of melatonin on POD levels in exercise and melatonin-exercise groups situated the same temperature. (E, exercise groups; ME, melatonin-exercise groups; S, sedentary groups; MS, melatonin-sedentary groups.) (*P*>0.05), No significantly difference among groups in same temperature.

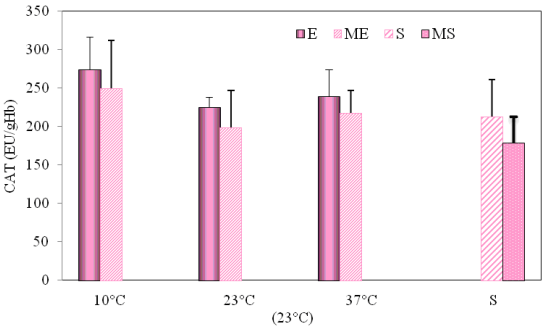

Figure 5: Effect of melatonin on CAT levels in exercise and melatonin-exercise groups situated the same temperature. (E: exercise groups; ME, melatonin-exercise groups; S, sedentary groups; MS, melatonin-sedentary groups.). (*P*>0.05), No significantly difference among groups in same temperature.

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EFFECT OF THE WRESTLING TRAINING TO LEVELS OF THE SERUM ZN AND FE

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ABSTRACT

The purpose of this study is to investigate serum levels of zinc and Fe in well- trained male wrestling team during and after an aerobic maximal exercise. Thirty well-trained young male wrestlers completed the wrestling training protocol. Blood samples were collected before the exercise, immediately after exercise and 1 h after the exercise. Serum was analyzed for Zn and Fe by using inductively coupled plasma optical emission spectrometry (ICP-OES) method. İt was observed that the maximal aerobic exercise have a significant effect on the serum levels of zinc and ferrum in elite wrestlers ($p < 0.01$).

Key Words: ICP-OES, Aerobic exercise, Zn, Fe.

Introduction

Zinc is associated with more than 200 enzymatic systems. It is involved in the synthesis of nucleic acids, protein synthesis, growth inflammatory syndromes, testosterone secretion and cerebral function. The systemic availability of zinc in tissues is highly influenced by the balance of anabolic and catabolic processes regulating the renewal of soft and skeletal tissues. Most of the body zinc content is present in muscle (60 %) and bone (30 %). No hormone has been identified in zinc metabolism specifically and uniquely, but Mg-and Ca-regulating hormones may effect zinc metabolism directly or indirectly'. Zinc status has an important effect upon the physical performance. Zinc is essential for many enzymes involved in energy metabolism during exercise (e.g. carbonic anhydrase, lactate dehydrogenase, superoxide dismutase).This trace element plays a role in tissue repair (J.R. Berning And S.N. Steen, 1998, D. Konig, C. Weinstock, J. Keul And H. Northoff, 1998).

Because of these reasons, zinc's role in exercise and its relationship to athletic performance are receiving attention. However there is no consensus regarding to the blood levels of zinc after the exercise. Some researchers claimed that blood zinc level was depleted after the exercise while others said the opposite (S. Savas, O. Senel, H. Celikkan, A. Ugras And L. 2006). Low blood levels zinc levels were reported in professional football players who participated in a daily physical training program of progressively increased workloads. During exercise, zinc may be redistributed from less to more metabolically active tissues. Runners were foıınd to have lower blood zinc levels but higher red blood cell zinc concentrations, possibility suggesting a redistribution of zinc during exercise (A. Singh, P.A. Deuster And Rb. Moser, J. 1990). (Van Loan et al 1999; Deruisseau et al 2002; Kikukawa and Kobayashi 2002) (S. Savas, O. Şenel, I. Okan, M Levent Aksu, 2007) . Kaya (M. Kaya, 2008); Hazar (M. Hazar); Aslan (F. Arslan, 2009), Savas (S. Savas, 2009).

Iron has a special place in nutrients as regard to effecting the performance. Iron is present in the structure of the blood and it is vitally important for the transport of oxygen. The total amount of iron in the human body is 4 g. 2.5 gram is present in hemoglobin which gives the red color of red blood cells. The remaining part 1.5 is stored as a stock. The iron in hemoglobin has a vital role in the transport of oxygen.

The transfer of iron from the tissues to blood is carried out by the use of copper. The iron coming from the dead red blood cells is used for the creation of new hemoglobin (S. Savas, 2005). This study was carried out to determine the effect control combat method applied to the wrestlers upon the iron and zinc levels of the body.

Effect of the Training to Levels of the Serum Zn and Fe

Metals	Variables	N	(X) (ug L')	Standard deviation	p
Zn	Before training	30	359,92	7,73	0.000*
	After training	30	303,07	5,61	
Fe	Before training	30	28,56	5,21	0.000*
	After training	30	33,46	3,00	

P<0.01

Table-1

ZİNC AND FE LEVELS BEFORE AND AFTER THE EXERCISE (REASERCH GROUPS)

Metals	Variables	N	(X) (ug L')	Standard deviation	p
Zn	Before training	30	271,55	4,93	0,008
	After training	30	271,69	1,79	
Fe	Before training	30	25,70	0,19	-
	After training	30	25,43	0,22	

P>0.05

Table-2. Zinc and fe levels before and after the exercise (control groups)

Zinc is an essential micronutrient for human body. Acute zinc deficiency results loss of weight, exhaustion, loss of endurance, osteoporosis and increase in viscosity of blood (A. Micheletti And R. Rossi, 2001, S. Khaled, J.F. Brun, G. Cassanas, L. Bardet And A. Orsetti, Clin, 1999).Van Loan et al. (M.D. Van Loan, B. Sutherland, N.M. Lowe, J.R. Turnlund And J.C. King, Int. J. 1999) found that isokinetic extension resulted a decrease of 67 % in plasma zinc levels which cause a significant decrease in muscle strength and total work capacity.Rodriguez Tuya et al.(I.R. Tuya, E.P. Gil, M.M. Marino, R.M.G. M. Carra And A.S. Misiego, Eur. J. Appl. 1991) reported a higher plasma-Zn level in anaerobic (judo and fencing) than aerobic (cycling and endurance). There are also studies in literature indicating that zinc levels remained unchanged after exercise. A study reported that the serum zinc levels in rats subjected to heavy exercise did not change, (H.C. Lukaski, W.W. Bolonchuk, L.M. Klevay, D.B. Milne And H.H. Sandstead, Am. J. Clin, 1983). In another study it was claimed that sub-maximal exercise did not effect the plasma zinc levels (A. Singh, F.M. Moses, B.L. Smoak And P.A. Deuster, 1992).

The reason why the Cu serum level didn't show any change with exercise may be due to exercise was anaerobic. Copper is present in cytochrom oxidase enzyme and carries electrons to oxygen during glucose metabolism. in aerobic exercise. The studies reveal that there is no correlation between the copper deficiency and the physical exercise taken (M. Hazar, F. Arslan, 2009). In this study, scrum levels of Zn and Cu before the exercise, immediately after the exercise and I h after maximal anaerobic (75 %) exercise were investigated in elite boxers. The aerobic capacity of the sportsman was observed to increase with the provision of adequate iron content. The prolonged iron deficiency results in the complication named anemia (S. Savas, 2005).

Methods

Experimental:

Thirty male subjects who are Turkish national wrestlers participated to this study. The median age of the participating subjects was 19, 64 ± 1.13 (year) ranging from 18 to 22. The other physical characteristics of the subjects were as follows (mean ± SD): weight (Kg) 80, 07 ± 15.68 (range 50-120), height (cm) 176.97 ± 6.69 (range 157-182).

Training protocol of the participants:

The participants were subjected to a 1.0 h, 80 - 100 % control combats training.

Intensity of loading: 80 – 100 % maximal

Time: 1 hour.

General Resting: 12 minutes (Stretching)

1- 7-8 minutes General warm up

2- 15 minutes technical warm up

3- 6 minutes control combats training (referee control)

4- 12 minutes jogging and stretching.

Blood sampling:

Blood samples were drawn from the antecubital vein of the subjects right before, immediately after and I h after exercise. Sample preparations and measurements: On the I mL blood samples was added 2.0 mL HNO.i and the samples were digested in Berghof/Microwave Digestion system MWS-3 microwave apparatus. The microwaves were kept at 160 °C for 5 min and at 190, 100 and 80 °C for 10 min each. The totally digested samples were diluted to 10 mL with the addition of deionized water 18.3 mohm cm'".

Zinc and copper were analyzed directly using inductively coupled plasma optical emission spectrometry (ICP-OES, Perkin Elmer, Optima 5300 DV, USA).

Statistical analysis:

Statistical analysis was performed with SPSS Ver. 15.0 for Windows. Statistical significance was set at $p < 0.01$ (with 95 % confidence levels). Te descriptive statistics of the data, the t-test of significance between the pre and post tests results the trace metal levels

Results and discussion

Before training and after the training maximal loading (aerobic) in serum zinc and fe levels, respectively were found to be 271.55± 4.93 and 271.69 ± 1.79 ug /L and these values for Fe were 25.70 ± 0.19 and 25,43 ± 0,22.mg/L. It was observed that the application of maximum loading to the elite wrestlers caused significant change in their zinc and Fe serum levels after the exercise as regards to their pre and post exercise values ($p < 0.01$) (Table-1).there is no need for outside oxygen. That explains the fact that the serum copper levels remains highly stabile during an anaerobic exercise. The reason for not observing any significant change during anaerobic exercise may be attributed to the fact that there was enough zinc content in the body to meet the demand. There are also studies in literature showing that blood copper and zinc levels do not change with exercise (A. Cordova And J.F. Escanero, A. Singh, F.M. Moses, B.L. Smoak And P.A. Deuster, 1992).

Therefore the results obtained in this study are in good accordance with literature.

Conclusion

This study revealed that there were not any significant changes in the serum zinc and copper levels of elite boxers before, just after and 1 h after the exercise. The results showed that the Zn and Fe content of the body were enough to meet the demand and there was no need to supplements after the maximum load anaerobic exercise.

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RUNNING SPEED DEVELOPMENT BY NON-SPECIFIC METHODS TO ATHLETES GIRLS OF 12 YEARS OLD

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Abstract

Improving endurance is as important as the speed and technique. Speed running and method Fartlek are essential components in the most field and trainer of physical qualities. Speed running has relationships with trainable physical qualities such as strength, power, speed endurance and technique. The speed running has long been accepted for evaluating by 30m and 50m events for children.

Objectıve

The aim of the present study was to investigate the relationship between speed running and Fartlek method.

Research methods and procedures

In this experiment participated two groups of subjects, each consisting of 15 athletes of 12 years age, with 2 years of practice in athletics. (15 girls for experiment group and 15 girls for witness group) participated voluntarily in the study. The age, body height and body weight were12.07±0.94, CV%-7.78, 149.73±6.54 CV%-4.3635.2±4.53 CV%-12.86 for experiment group and 12.86±0.84, CV%-6.53, 148.80±6.04, CV%-4.05, 36.93±3.85, CV%-10.42 for witness group, respectively (mean±s). The subjects performed three tests: two events for speed running 30m, 50m a distance running during 2 min running test. All data are expressed as mean± standard deviation (s). Pearson's r product-moment correlations coefficients were used to explore the relationships between 30m and distance running during 2 min running $p< 0.05$ and 50m and distance running during 2 min running $p>0.05$.

Results and discussion

For 30m girls from experimental group obtained a significant difference between initial and final tests t dependent tests (n-1) 1. Numerical value of t shows a significantly different from one $p<0.025$ for "t" *student test* (n-1) between initial and final tests and significantly different $p<0.005$ for t student (n-2), for final testing between groups experiment and witness. Numerical value of "t" *student test* shows a significantly different from one $p<0.025$ for t (n-1) between initial and final tests and significantly different $p<0.005$ for t student (n-2), for final testing between groups experiment and witness for running on distance during 2 min. For Pearson correlation "r" there were significant and inverse relationships between 30m speed running and distance running 2 min event, $r=-0.57$, $p<0.05$ and insignificat between 50m speed running and distance running 2 min event.

Conclusions

Hypothesis was not confirmed in all. Significant progress has obtained evidence of only speed running of 30m event. Method of Fartlek to hill positively influenced running the test speed of 30 m distance, while not contributed to the speed of distance of 50m race to girls of 12years old.

Therefore method Fartlek may also be considered as possible predictor factor speed running on event 30m sprint.

Key words: athletics, children, fartlek method, speed running, training.

Introduction

In relation to the duration of all-out running, these speed decrements are not uniform. Speed decreases markedly with increases in the duration of shorter efforts (i.e., _180 s) but only modestly with the same relative increases in the duration of longer ones. Accordingly, top sprinters attain race speeds nearly twice as fast as those achieved by the best milers, but mile runners race only moderately faster than marathon runners do. The negative exponential relationship between all-out speed and run duration is generally attributed to differences in the metabolic power available from anaerobic vs. aerobic sources in relation to time (M. W. Bundle, R. W. Hoyt and P. G. Weyand, 2003). Specifically, peak rates of anaerobic energy release, which fuel brief maximal efforts, decline rapidly as the duration of the trial increases.(R. Margaria, 1976)

In contrast, the peak rates of aerobic energy release during prolonged efforts vary relatively little with event duration. For example, well-trained athletes can maintain _80% of their maximum aerobic power for events from 10 to 120 min (5–7). The quantitative relationship between maximal aerobic power and endurance performance has been well established for more than two decades. Consequently, standardized laboratory tests of aerobic energy release have been established for some time. Speed acceleration, as a manifestation form complex speed is most important in sport because reflects the concrete possibilities of the athletes to run the distance with maxim speed running. In evidence of athletic speed events is essential for victory and in many branches of sports as football, handball, lawn tennis, rugby, basketball etc., speed of

movement can create large indisputable advantages in certain phases of competitions sports. Speed of movement is in a relationship of interdependence dialectics relative to elementary forms of speed. (I. Baroga, 1984). Thus, the sprint's events, athletics performance achieved depends of times the speed of repetition of cycles but also the full length of step (closely correlated with length feet and forced to push the muscles), fine coordination of muscle activity groups agonist and antagonist. (C. Delecluse, H. Van Coppenolle, E. Willems, M.Van Leemputte, R. Diels, M.Goris, 1995). In terms of physiological, motor acts performed with great speed based on high-repetition speed orders transmitted by nerve muscle effectors. With maximum speed of motion sensitive proprioceptive signals the starting point of the muscle can not intervene in correcting mistakes coordination as feedback mechanisms do not have enough time for it.(I. Dragan, 1989). Resistance requires intensity anaerobic work so great that recovery ATP can be obtained only by creatinfosfat (CP) and anaerobic glicoliza. The duration of an effort is about 1 min., Limit being determined by the accumulation of lactic acid in muscles, which begins to disrupt muscle metabolism, transmission of nerve impulses and restore ATP. W. H. Hegeloch quoted by A. Nicu, 1993, related to the accumulation of ammonia in the blood after an effort anaerobic resistance, the average duration of anaerobic effort lactacid being 47-47 and 11 s. While lactate reached maximum values of 12.98 mmol / l in minutes 3 strength after exhaustive effort, ammonites recorded maximum in minute 3, representing 123.3 micromoles / L. The ratio of ammonium and lactate values at rest was 27.7 and decreased to 9.8 after the first minute, the minimum being reached in the 15th minute, then increase again, reaching after 30 minutes to 12.4. The authors consider that the future belongs to the above determination of serum ammonium, resulting in comprehensive effort towards resistance anaerobic metabolic activation miokinaz-line adenilat deaminase. (A.Nicu, 1993). Until a certain duration of effort (in mind, especially anaerobic capacity), resistance will depend directly on the speed. The maximum speed is the highest level; the work done at speed under maxim can be extended further. As an example: a Sprinter with a result of 10.4 to 100 m flat, will make it easier 6x100 m, every 12 seconds and repeat with a break of 3-4 minutes, than another who has a result of only 11 , 5 sec/100m flat. Such relations are based on indicators and coefficients of resistance (A. Murray, TC. Aitchison, G. Ross, K. Sutherland, I. Watt, D. McLean, S. Grant, 2005). Fartlek means "running the game tempo or "the tempo of the game" in Swedish. Is a form of training that emphasizes continuity effort aerobic nature of this exercise. The difference between this type of training and regular training is that the intensity or speed of running exercise varies, meaning that aerobic and anaerobic systems can be required. Most training takes at least 45 minutes and range from walking briskly to anaerobic sprint. Fartlek training is generally associated with running, but can include almost any kind of exercise, including cycling, rowing and swimming and is a method which develops physical qualities of small athletes (W.Piddle, 2 005, T. Bompa, G. Gregory Haff, 2009.)

Hypothesis

The hypothesis of this longitudinal experiment supposed that Fartlek method contributes to improving the speed and time in 30m and 50m events to athletes aged 12 years.

Methods

Subjects

15 athletes' girls aged 12.07±0.94 of Experiment group and 15 athletes' girls aged 12.86±0.84 of Witness group participated voluntarily in the study. They have 2 years old in athletics practice. A written consent was obtained from the parents before the study. The age, body height and body weight were presented in table no.1. We calculated mean±S and CV% values. Values of CV% are very good for age (years, month) and body height (cm) <10 and good >10 for body weight (kg).

Table 1. Physical characteristics of the subjects

Variables	Experiment group mean± S; CV% n= 15 girls	Witness group mean± S; CV% n= 15 girls
Age (years, month)	12.07±0.94 CV%-7.78	12.86±0.84 CV%-6.53
Body height (cm)	149.73±6.54 CV%-4.36	148.80±6.04 CV%-4.05
Body weight (kg)	35.2±4.53 CV%-12.86	36.93±3.85 CV%-10.42

Tests: The subjects performed three tests: speed running 30m, (table no.2, 3), 50m(table no.6,7) and running during 2min.(table no. 4, 5) Were registered on time and 30m running time of 2 min was recorded by the distance that the girls ran for 2 min. Running speed on 30m and 50m were registered by 2 photoelectric cells. Between initial test and final test, both groups of subjects were trained for a month.

Experiment group subjects during 4 weeks trained 4 practices per week, (Constanta, 2009, april):

Fartlek to hill

-20 min preparatory part

-10 min easy running

- 2 race x 3 x 500m running speed to hill 85% intensity, revert back to valley by easy running between running speed 85% and between races running more easily no hill, no valley during 5 min.

-10 min easily run and 5 min stretching.

Witness group subjects during 4 weeks trained 4 practices per week normal athletics practice with game sport to end of training.

Statistical Analysis

All data are expressed as mean ± standard deviation (s). Data were verified for normality of distribution. "t" test student dependent and independent

between groups tests initial and final tests for find the significant difference or insignificant difference between tests.

Pearson's product-moment correlations coefficients were used to explore the relationships between time of 30m speed running and distance running during 2min, statistical significance was set to $p< 0.05$. Between time of 50m speed running and distance running during 2min statistical insignificance was set to $p>0.05$.

Results and discuss

In tables 2 and 3 show times are obtained from subjects in 30m standing start event. Numerical value of t shows a significantly different from one $p<0.025$ for "t" *student test* (n-1) between initial and final tests and significantly different $p<0.005$ for t student (n-2), for final testing between groups experiment and witness.

Table no2. Speed running 30m standing start -initial testing

Initial testing mean± S; n= 15 girls			
Para-metric	**Exper iment group**	t dependent tests	**Witness group**
30m	5.11±0.55	(n-1) 0.85*	5.28±0.58

*insignificantly different p.>0.05

Table no. 3. Speed running 30m standing start -final testing

Final testing mean± S; n= 15 girls			
Para metric	**Experi ment group**	t dependent	**Witness group**
30m	4.7±0.55	tests(n-1) 2.321*	5.18±0.58
t	Indepen dent (n-2)	tests	3.610**

*significantly different $p<0.025$
** significantly different $p<0.005$

In tables 4 and 5 show distance are obtained from subjects in distance running 2 min event. Numerical value of "t" *student test* shows a significantly different from one $p<0.025$ for t (n-1) between initial and final tests and significantly different $p<0.005$ for t student (n-2), for final testing between groups experiment and witness.

Table no. 4. Distance running during 2 min

Initial testing mean± S; n= 15 girls			
Para-metric	**Experiment group**	t dependent tests (n-1) 1.81*	**Witness group**
Distance running during 2 min	561m±3.55		529±4.58

- significantly different $p<0.05$

Table no. 5. Distance running during 2 min

Final testing mean± S; n= 15 girls			
Para-metric	**Experiment group**	t dependent tests(n-1) 2.531*	**Witness group**
Distance running during 2 min	589m±3.55		541±4.58
t	Independent (n-2)	tests	3.610**

*significantly different $p<0.025$
** significantly different $p<0.005$

In tables 6 and 7 show times are obtained from subjects in 50m standing start event. Numerical value of "t" *student test* shows a insignificantly different from $p>0.05$ for t (n-1) between initial and final tests and also insignificantly to $p>0.05$ for t student (n-2), for final testing between groups experiment and witness.

Table. no 6. Speed running 50m standing start -initial testing

Initial testing mean± S; n= 15 girls			
Para metric	**Experiment group**	t dependent tests(n-1) 0.96*	**Witness group**
50m	9.21±0.46		9.29±0.69

*significantly different p.>0, 05

Table no 7. Speed running 50m standing start -final testing

Final testing mean± S; n= 15 girls			
Parametric	**Experiment group**	t dependent tests	**Witness group**
50m	9.01±0.55	1.03*	9.17±0.58
t	Independent (n-2)	tests	1.510*

*insignificantly different p.>0, 05

For Pearson correlation "r" there were significant and inverse relationships between 30m speed running and distance running 2 min event, r=-0.57, p<0.05 and insignificat between 50m speed running and distance running 2 min event (table no.8).

Table no. 8.Values for Pearson's Correlation- r - final tests - girls

mean± S; n= 15 girls		
Parametric Final testing	**Experiment group** Correlation Pearson r	**Witness group** Correlation Pearson r
30m/distance running 2 min	4.7±0.55 589m±3.55 r=-0.57*	5.18±0.58 541±4.58 r=0.41**
50/ distance running 2min	9.01±0.55 589m±3.55 r=0.39**	9.17±0.58 541±4.58 r=0. 14**

*significant and inverse relationships between 30m and distance running 2min, p<0.05
****insignificant p>0.05

Conclusions

Hypothesis was not confirmed in all. Significant progress has obtained evidence of only speed running of 30m event. Method of Fartlek to hill positively influenced running the test speed of 30 m distance, while not contributed to the speed of distance of 50m race to girls of 12years old. Therefore method Fartlek may also be considered as possible predictor factor speed running on event 30m sprint.

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EFFECT OF SPEED TRAINING UPON THE BLOOD PARAMETERS OF YOUNG MALE SOCCER PLAYERS

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ABSTRACT

This study was carried out to determine the effect of speed training upon the blood parameters of young soccer players. The study was participated by 14 players playing in Ankaragücü football club young team with an average age of 15.21 ± 0.80 years .The participants in the experimental group were subjected to a 8 week sprint training 1.5-2 hours a day three says a week. The test group was subjected to a some physical and blood tests before and after the exercise. The data obtained were evaluated by paired simple t test and 11.0 SPSS test in order to determine the differences between the pre and post training values. The results showed that there ware significant values between the pre and post training blood values of the experimental group. ($p<0.01$) table:2

Key words: soccer, speed, blood - physical parameters.

Introduction

Speed is described as the "The capacity of one from one place to other place as fast as possible" or "skill of carrying out the movements as fast as possible "(Y. Sevim.,et al, 1997). Speed in a physical sense is distance covered in a specified time. (C. Acıkada, et al,1990) According to the training theory speed is the virtue of moving the the part of the whole of the body as fast as possible .

According to Ross et al., 2001, the sprint has three phases as acceleration, reaching to the maximum speed and maintenance of it. (A. Ross, M. Levedtt, S. Riek, Little and Williams, 2005) subjected 106 professional players to 10 m and 20 m sprints and zigzag movement agility and found no significant relations between them.(T. Little, A.G. Williams, 2005). Ribero and Sena,1997, 82 divided 82 players according to their positions. Each group was subjected to 1.5 minute rest, then five 30m sprint and determined that the fastest ones were the forwards and the slowest ones were the goal keepers (B. Ribero, P. Sena, 1997). Young et al. (2001) subjected 36 male players to 30m sprints and runs with changing the directions. The sprint tests were found to be more beneficial upon the speed than the runs made with changing the directions. The aim of this study is to determine the effect of the speed training upon the blood parameters of young players.

Material and the Method

The study was carried out upon 14 participants playing in the young team of Ankaragücü soccer team with an average weight and length of 15.00 ± 0.35 years and 172.39 ± 8.01 cm. They were subjected to a 8 week sprint training 1.5-2 hours a day three says a week. The participants were adequately briefed about the importance of the study. The physical and anthropogenic features of the participants were determined before the study. They were then subjected to specially selected physiological tests by taking 5 cc venous blood before and after the study. The physical parameters of the participants were determined before the start and after the completion of the study for comparison purposes.

Sprint training given to the experimental group

Table 1 Sprint program given to the participants [2]

1.week	2.week	3.week	4.week	5.week	6.week	7.week	8.week
3x10m	4x10m	5x10m	3x30m	4x30m	5x30m	5x30m	5x30m
3x20	4x20	5x20	3x40	4x40	5x40	5x40	5x40
3x30	4x30	5x30	3x50	4x50	5x50	5x50	5x50
3x40	4x40	5x40	3x60	4x60	5x60	5x60	5x60
3x50	4x50	5x50	3x70	4x70	5x70	5x70	5x70
Total 1 set= 450 m	Total 1 set= 600 m	Total 1 set= 750 m	Total 1 set= 750 m	Total 1 set= 1000 m	Total 1 set= 1350 m	Total 1 set= 1350 m	Total 1 set= 1350 m

Results

It was found that 8 week sprint training caused statistically significant changes on the hematocryte , erythrocyte hemoglobin and creatine kinase values of the young football players (P<0.01).

Table: 2 The physical values of the experimental group

N=14		**Year (year)**	**Length (cm)**	**Body weigh (Pre test) (kg)**	**Body weigh (Post test) (kg)**	**Comparison of the pre and post test body weights**
Experimental group	**X**	15.21	172.39	61.56	60.07	t= 8.17 P=0.00*****
	ss	0.80	8.01	6.47	6.38	
	ss	0.73	9.60	10.88	10.72	

Comparison of the t-test results of the pre and post test blood values of the experimental group

Table: 3 Pre and post test blood values of the experimental group according to t- test

Parameters N=14	**Group**	$\overline{X}$	**S**	**r**	**t**	p
HCTS Hematocryte (%)	Pre test	39.18	1.37	0.60	-4.67	**0.00***
	Post test	41.42	2.23			
RBCS Erythrocyte (10^6/mm^3)	Pre test	5.08	0.29	0.66	-4.37	**0.00***
	Post test	5.38	0.32			
HGBS Hemoglobin (g/dL)	Pre test	14.24	0.63	0.89	-5.61	**0.00***
	Posttest	14.97	0.96			
CK Kreatin kinase (U/I)	Pretest	535.28	320.50	0.35	3.54	**0.00***
	Posttest	250.78	136.63			

*** P< 0.01**

The comparison of the pre and post test blood values of the experimental group revealed statistically significant differences between hct, rbc, hgb and ck results. P<0.01

Discussion

According to the result the HCTS pre test value of 39.18 ±1.37 ug/l to 41.42 after the test . The difference between them was statistically significant (p<0.01) . RBCS pre test value also showed a statistically important change from 5.08 ± 0.29 ug/l to 5.38 'e ± 0.32 ug/l. The pre and post test values of HGBS were 14.24 ±0.63 ug/l and 14.97 ± 0.96 ug/l which is also a change with statistical importance (p<0.01) . CK values also changed from 535.28 ± 0.98 to 250.78'e ± 0.96 ug/g. This is also of statistical significance (p<0.01).These values showed good parallelism with the literature values.[1, 9 – 13]

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SOME PERFORMANCE PARAMETER CHANGES DURING MENSTRUAL CYCLE PERIODS OF ATHLETES AND NON-ATHLETES

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ABSTRACT

The aim of this study was to determine athletes' and non-athletes' performance parameters during three menstrual cycle periods (pre-menstruation, during menstruation, post-menstruation). 40 athletes (age; 17.25±3.1 years) and 40 non-athletes (age; 17.29±0.7 years) who have a regular menstrual cycle period participated the study. Body weight, body fat ratio, resting heart rate, blood pressures, reaction time, hand grip strength, 20m sprint time and anaerobic power were measured in pre menstruation, during menstruation and post menstruation periods along 3 months. For the statistical analysis, student t-test was used to compare the performance parameters of athletes and non-athletes. One-way analyses of variance were performed to assess differences between menstrual cycle periods.

The mean body heights of athletes and non-athletes were 1.65±0.05 cm and 1.64±0.04 cm respectively. The mean body weights were 59.7±6.13 kg and 57.7±6.9 kg of athletes and non-athletes. The mean menarche age of athletes was 13.47±0.11 years and of non-athletes was 12.62±0.13 years. Menarche ages and resting heart rates were found significantly different ($p<0.05$) between groups but body fat ratio and blood pressures couldn't find significantly different ($p>0.05$). Vertical jump, reaction times, hand grip strength and 20 m sprint parameters were significantly different ($p<0.05$), but anaerobic power values were not found significantly different ($p>0.05$) between two groups. Performance parameters didn't differ between menstrual cycle periods in both athletes and non-athletes ($p>0.05$). It's concluded from this study that athletes attained menarche later than non-athletes. Menstrual cycle periods didn't significantly affect sportive motor performance of basketball, volleyball players, judokas and non-athletes.

Key Words: Menstruation, performance param.

Introduction

In Turkey there is some disagreement regarding sports participation during menses. However it has known that records were broken and medals were taken during all portion of the menstrual cycle. Because of the high intensity training some physical and physiological changes could happen. Changes in body weight, body fat ratio and hormonal secreting values could effect menstrual cycle (B. Bullen, 1985, C.

Gleichauf, D. Roe, 1989, L. Fox, R. Bowers, M. Foss, 1998). Physical and psychological effects as a result of menstrual cycle change person to person. While no changes could happen before or during the menstruation in some females; physical and physiological changes could happen in some females. Although all the athletes were differently affected from the menstrual cycle, there is a common agreement that performance is greater in the post menstrual periods (H. Harrison, 1976, A. Loucks, 1990, J. Ussher, J. Wilding,1991). Anaerobic power is one of the performance parameters and it's related with power of muscle and speed of using ATP-CP system. Reaction ability is positively related with speed (O. İmamoğlu et al, 1996). There isn't much research about the effects of menstrual cycle on these parameters in Turkey. So in this study it's aimed to determine the effects of menstrual cycle on performance in pre-menstrual, menstrual and post-menstrual periods.

Material and method

40 female athletes (age; 17.25 ± 3.1 years) and 40 female non-athletes (age; 17.29 ± 0.7 years) having consented to participated in this study who were active basketball, volleyball players and judokas. All the subjects were healthy and have regular menstrual cycle, and none of them use oral contraceptives. A questionnaire contains some properties and a situation about menstrual cycle was applied to the athletes. The measurements were done pre-menstruation (26-28 day of the cycle), during menstruation (1-6 day of cycle) and post-menstruation (7-12 day of cycle) periods.

Body weight was measured using levelled platform scale (sensitivity±100 gr). The subjects were weighted with shorts and a T-shirt, and without shoes. Height was measured using a portable stadiometer (sensitivity±0.25 cm). The subjects were measured distributed to both feet head positioned in the Frankfurt Horizontal plane.

Vertical jump height was measured by vertical jump meter and, anaerobic power (P) was calculated by this formula P=√4.9x Body weight x √Jump Distance. Reaction time measurements were taken by Dekan automatic performance analyser that records time 1/100 second by right hand.20 m sprint test was done by photo-cell. Hand grip strength was measured by 78011 model hand dynamometer that produced La Fayette Instrument Company.

Skin thickness was measured from abdomen, suprailiac, triceps and subscapula by Holtain marked skinfold (sensitivity 0.2 mm) from the right side of the body. Body Fat Percentage (BF) was calculated by this formula, BF= (0.159 x Abdomen) + (0.147 x Suprailiac) x (0,151 x Supscapular) + (0,155 x Triceps) + 5,692 (14). Resting blood pressures and heart rates were measured by 53-600 digital Samsung marked tansiometer in the morning after wake up and sitting 5 minute on the chair.

Statistical Analyses: Student t-test was used to compare the performance parameters of athletes and non-athletes. One-way analyses of variance were performed to assess differences between menstrual cycle periods. Values are expressed as means ± standard deviations.

Results

Physical and physiological characteristics of subjects were given in table I. The mean body heights of athletes and non-athletes were 1.65±0.05 cm and 1.64±0.04 cm respectively. The mean body weights were 59.7±6.13 kg and 57.7±6.9 kg of athletes and non-athletes. The mean menarche age of athletes was 13.47±0.11 years and of non-athletes was 12.62±0.13 years. Menarche ages and resting heart rates were found significantly different ($p<0.05$) between groups but body fat ratio and blood pressures were not found significantly different ($p>0.05$). Motor performance parameters of athletes and non-athletes were given in table II. Vertical jump, reaction times, hand grip strength and 20 m sprint parameters were significantly different ($p<0.05$), but anaerobic power values were not found significantly different ($p>0.05$) between two groups. Motor performance parameters between pre, post and during menstrual cycle periods were given in table III. Performance parameters didn't differ between menstrual cycle periods in both athletes and non-athletes ($p>0.05$). When heart rate and blood pressure parameters were compared between menstrual cycle periods (table IV), no significant differences were found.

Discussion

The mean body height and weight of athletes were 16,5±0.05 cm and 59.7±6.13 kg, of non-athletes were 1.64±0.04 cm and 57.7±6.9 kg. The menarche ages were 13.47±11 years for athletes and 12.62±0.13 years for non-athletes. The body weight and body fat ratio values were not significantly different between three menstrual cycle periods ($p>0.01$). The menarche ages, abdomen skin thickness and heart rate of two groups were found significantly different ($p<0.05$). Age, body weight, height, body fat ratio, triceps, suprailiac, and subscapula skin thickness, resting blood pressures were not found significantly different ($p>0.05$) between two groups.

It has determined that females who began sports in the early ages attained menarche later and menstruation disorders of these females increase (L. Fox, R. Bowers, M. Foss, 1998). The age at which menarche began is significantly higher in the American female athletes than in her non-athletic counterpart. High school and college athletes attained menarche significantly later than non-athletes, and various groups of national and Olympic athletes attained menarche significantly latter than the high or school collage athletes. On the other hand, age of menarche for Hungarian athletes has been found to be little affected by athletic competition (L. Fox, R. Bowers, M. Foss,

1998). While average menarche age of Belgium gymnasts have found 15.6 ± 2.1 years, the average menarche age of girls in general population have found 13.2 ±1.2 years (A. Claessens, R. Malina et al., 1992). In different studies the menarche ages were found 15.6 years for gymnasts, 14.5 years for dancers, 13.3 for runners, 13.1 years for swimmers, 13.1 years for volleyball players, 13 years for handball players and 12.8 years in American control group (N.W. Constantini, M.P, Warren, 1994): The mean menarche age was found 12.29 years in non-athletes (L. Fox, R. Bowers, M. Foss, 1998). In our study menarche ages were found in normal values both in athletes and non-athletes, but the athlete's attained menarche later than non-athletes. It has taught that menstrual function disorders were greater in the athletes that trained high intensity in adolescence period.

The vertical jump values were found 25.75±3.93 cm in athletes (7), 43.6±5.6 cm in basketball players (I. Çimen, İ. Cicioğlu, M. Günay, 1997). The vertical jump values of athletes and non-athletes were 41.1±4.26 cm and 29.7±4.26 cm in pre-menstruation period, 41.3±4.0 cm and 29.9±4.09 cm during menstruation and 41.7±4.1 cm and 30.4±3.99 cm in post-menstruation period. The athletes' vertical jump values were found significantly high than non-athletes ($p<0.05$). Therefore our results are similar to the results of Jurkowski et all,1996 study. Vertical jump values were not significantly different between pre, post and during menstruation ($p>0.05$) in both athletes and non-athletes.

The best visual reaction time is between 0.15-0.20 sec and the best auditory reaction time is 0.12-0.27 sec. According to Grasser,1976, the reaction time to voice is between 0.11-0.24 sec; and according to Zaciorskij (1973) the reaction time to light is between 0.1-0.24 sec. The reaction times differ between 0.05-0.35 sec in different reaction forms (O. İmamoğlu, K. Özer, S. Muratlı, G. Hergüner, 1996). In one study, the visual reaction time was found 0.97 sec, the auditory reaction time was found 0.188 sec in female students attending to physical education and sports department (18). In our study athletes' and non-athletes' auditory reaction times were found 14.1±1.13 sec 17.5±2.41 sec in pre menstruation period, 14.05±1.03 sec. and 17.4±2.40 sec during menstruation, 14.02±0.98 sec and 17.4±2.21 sec. in post-menstruation period. Athletes' and non-athletes' visual reaction times were found 14.3±1.30 sec and 17.8±2.40 sec in pre menstruation periods, 14.2±1.18 sec and 17.9±2.45 sec during menstruation, 14.1±1.12 sec and 17.9±2.46 sec in post menstruation period. The reaction times of athletes were significantly better than non-athletes ($p<0.05$). Better reaction times of athletes could be explained with training and sportive condition. Because auditory reaction time could decrease from 0.12-0.27 sec to 0.05-0.17 sec with training (O,İmamoğlu K, Özer S, Muratlı G Hergüner, 1996). The reaction times weren't found significantly different between menstrual cycle periods ($p>0.05$) in both groups.

20 m sprint times were found 3.62±0.84 sec in female national Turkish table tennis players, 3.33±0.66 sec in female volleyball players and 4.10±0.18 sec in different sports branch athletes (20). In our study 20 m sprint times of athletes and non-athletes were 4.12±0.18 sec and 4.66±0.65 sec in pre-menstruation period, 4.11±0.17 sec and 4.74±0.67 sec in menstruation period, 4.10±0.16 sec and 4.58±0.59 sec in post menstruation period. 20 m sprint values were significantly different between athletes and non-athletes ($p<0.05$); athletes' sprint values were better. Between menstrual cycle periods, 20 m sprint values were not found significantly different ($p>0.05$) in both groups.

In our study, the hand grip strength values of athletes were similar with literature (F. Ergül, M. Günay. Elit 1997, A. Rodzijevskij, S. Kurup, L. Schachlina, I.S. Beresterkaja, 1994) Athletes' hand grip strength values were higher than non-athletes ($p<0.05$). Between menstrual cycle periods the strength values didn't significantly differ ($p>0.05$). The anaerobic power values of athletes were higher than non-athletes but this difference was not significant ($p>0.05$). The anaerobic power values weren't significantly different between menstrual cycle periods ($p>0.05$).

Higgs and Robertson (1981) supports that the menstruation phases don't effect the sportive performance. Brain et all (1991) determined that sportive performance was higher during menstruation. A questionnaire that applied to females in 1964 Tokyo Olympiad games showed that 37% of the athletes thought their performance were not negatively affected from menstruation. Jurkowski (1986) found that by the effect of oestrogen and progesterone hormone athletes got tired lately during menstruation. Menstrual cycle didn't effect speed and physical capacity (R, Özdemir, S. Küçükoğlu., Özdemir et. al., 1993) searched the effect of ovulation on power; they found similar strength values in the 8 and 21 day of cycle (16). Sarwar and et all (1996) found strength didn't change between menstrual phases (1.-7.; 7.-12.; 12.-18. day) in women who use oral contraceptive. Dibrezzo and et all (1991) didn't find differences in power between three phases of menstrual cycle. Higgs and Robertson (1981) didn't find differences in hand grip muscle strength and knee extensor muscle strength among two menstrual cycle. Rodzijevskij and et all (1994) determined that menstrual cycle phases didn't effect swimming performance. Lebrun et. all (1995) examined the effects of menstrual cycle phase on four selected indices of athletic performance; aerobic capacity, anaerobic capacity, isokinetic strength and high intensity endurance. They found the cycle phase didn't impact significantly on the majority of the performance tests and cardio-respiratory variables (C. Lebrun, J. Prior Taunton, 1995). Female athletes reporting poorer performance during menstruation, a large percentage

were endurance athletes (e.g. tennis players and rowers). Performances for volleyball and basketball players and swimmers and gymnasts were better than for the endurance athletes (L. Fox, R. Bowers, M. Foss, 1998). In our study motor performance parameters were not significantly different between three menstrual cycle periods ($p>0.05$). Results of our study were similar with the literature that consist speed and strength.

Exercise and regular training can decrease resting heart rate. In our study resting heart rates of athletes and non-athletes were found significantly different ($p<0.05$). Systolic and diastolic blood pressures were not found significantly different ($p>0.05$). From a physiological standpoint, metabolic and cardiovascular responses at rest and during maximal exercise are not systematically affected during different phases of menstrual cycle (L. Fox, R. Bowers, M. Foss, 1998). In our study resting heart rate, systolic and diastolic blood pressures weren't different between menstrual cycle periods ($p>0.05$). Reason of the low heart rate in athletes can be explained by adaptation that occurs by sports and regular training.

It's concluded from this study that athletes attained menarche later than non-athletes. Menstrual cycle periods didn't significantly affect sportive motor performance of basketball, volleyball players, judokas and non-athletes.

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THE CHRONIC EFFECT OF SPEED EXERCICES OF FOOTBALL PLAYERS ON THE NITRIC OXYDE (NO) LEVEL

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Abstract

Target: We aim to analyze of speed tests' chronic effect on nitric oxide for footballers.

Method: In the our study; we searched physical efficiency in 30-60 minute by medium stress and 3 days a week (for 8 weeks); and also at the beginning and ending of programme speed test was applied (20mt). While resting period and after the test; blood examples were sampled.

Findings: In the test results before the program; before speed test serum NO levels were 25.5911 ± 1.5; after speed test result were 19.6161 ± 2.0. This decrease on serum NO level does not have any meaning as statistical ($p>0.001$).

In the test results after the program; before speed test serum NO levels were14.8348 ±1.36 iken; after speed test result were 11.7881 ±1.30. This decrease on serum NO level does not have any meaning as statistical ($p>0.001$).

Result: By the making sport regularly and efficiently; it makes strengthen hormonal system, immun system and cardiovasculer system, helps to increase muscle mass; but maximal exercises which made tired to body NO levels might be decrease. However; although decreasing on NO levels, we are expecting that rising on levels at the resting period.

Key words: Nitric Oxide, Speed test, Oxidative press

Introduction

Nitric oxide (NO) is a colorless, stabile gas which can be solve in water and which can be oxidizes easily to nitrite (NO_2) and nitrate (NO_3^-) with a half-life of 30 second. (A. Kuyumcu, A. Düzgün, M. Özmen, H. Besler, 2004) It takes a part in cases of several illness in several functions of organism. It is produced by almost every cell and displays activity on every cell. So, NO is a general agent molecule. In case of contact with air it react rapidly with oxygen and transforms to Nitrogen dioxide (NO_2). Nitrogen dioxide is a toxin gas which can cause tissue damage (C. Borland, T. A. Higenbottam, 1989).

The NO radical react with other free radicals and prevents over accumulation of free radicals in tissues (B. Matthew, D. Jourdheuil, D. Wink, 1999). Other free oxygen radicals are harmful in all concentrations, but NO play a part in arrangements of several important physiological events such as: arrangement of blood pressure and digestive system, host defense and nonspecific immunity. But, if it is produced in an unsuitable place and overabundance it causes to arise several pathological situations (O. Nitrik, 2000).

In exercise, the amount of blood that passes through coronaries provide an enlargement of veins and thus, more blood reaches to every departments of hearth. Regular aerobic trainings reduce the blood pressure in hyper tension. But its effect in violent hypertension is a little (A. Pehlivan, 2000).

In sport exercises, the organism is exposing to charges above the daily life level. In exercise, the duty of blood is to compensate metabolic and O_2 needs of tissues. The blood pressure is a power which provides the blood flow. The blood pressure (tension) is the pressure that the blood compress to the walls of veins (inner walls) (M. Günay, K. Tamer, I. Cicioğlu, 2006)

The effect of nitric oxide is aimed at enlargement of veins and acceleration of blood flow. Nitric acid keeps bloodstream in order and provides that the veins remain clear. The veining which is rich in terms of NO is greasy like teflon and when preventing the enlargement of coagulum by draining plaques fluently, the unhealthy vein namely the vein poor in terms of NO, give rise to accumulation of plaques in sticky inner walls of veins (J. Louis, Ignarro (Çeviri) Ö. Öztürk, 2007**)**.

Until 90's, in several studies it is demonstrated that regular physical activity has an important role in therapy and avoiding from several diseases especially, cardiovascular diseases.

But it wasn't known what or which actors cause useful effects of physical exercise. Since the discovery of NO molecule, several studies have finished, in these studies the effects of physical exercises upon endothelium cells have been evaluated and it is seen that the production of its factors that relieve body and correlation are provided by useful products which are produced during physical exercises (W. Sessa, K. Pritchard, N. Seyedi, J. Wang, T. Hintze, 1994, Y. Higashi, S. Sasaki,N. Sasaki, K. Nakagawa, T. Ueda, A. Yoshimizu, et. al., 1999, B. Kingwell, 2000, M. Delp, 1993, K. Roberts, R. Barnard, A. Jasman, T. Balon, 1999).The aim of this study is the investigation of the effect of speed exercises of football players during 8 weeks upon nitric oxidelevel.

Material and method.

The Choice of Subjects

This study is made upon 18 active amateur football players between 19-30 ages who don't have any health problems. In the study, the goal of study and

possible risks are explained to subjects and their written consents are obtained.

Method

After a warming time of 20 minutes at a synthetic floor in an area closed to subjects, the tests have performed. The test is consisting of 10 sprint of 20 meter and jog-trot of 50 meter. Subjects have completed their first race when they feel themselves ready (before the start command) by starting at maximum speed from zero point where the start photocell is placed. The same systems have repeated in 10 sprints that have done. The blood measurements have done two times: before and just after the overload.

Equipment

Velocity measurement: In the start and finish it is benefited from photocell, and in the determination of racecourse it is benefited from cones.

The measurement of Height and Weight: For the sportsman of experimental group the measurements of height are taken in cm and weight are taken in kg and are measured in bascule that measure height

Blood Analysis: In heparinize blood examples that are taken from antekubital veins NO (nitric oxide) levels are determined. The blood examples are taken before and after the overload.

Taking Blood Examples: Blood examples are taken in normal biochemistry tubes and in tubes with EDTA. The examples that are taken to tubes with EDTA are rummaged during 3-5 minutes, are kept waiting during 5-10 minutes in room temperature and then centrifuged during 5 minutes at 3500 rpm and elements are precipitated, the plasma that remain on top are taken into ephendorph tubes they are kept until the day of analysis at – 80ºC.

***Analysis of Nitric Oxide* (NO):** NO radical which is very short-lived quickly oxidize to NO^{-2} and $NO^{-3.}$ Therefore, when determining NO amount, the amounts of NO^{-2} and NO^{-3} are also determined. Especially the determination of absorbance of the color that is formed as a consequence of interaction with Griess reactive of NO^{-2} is in use widespread. Existing NO^{-3} is measured after redacting to NO^{-2} with nitrate reductase. (S. Dong-Ju and F. O. Tımothy, 2003)

***Reactive that is used*:** Zinc sulfate, reactive of Griess, NADPH, FAD, nitrate reeducates lactase dehydrogenize, sodium private and potassium nitrate stock solution.

Specification of Nitrate: The serums that are taken at -80^0C are kept at -20^0C and then at 4^0C for a while and after, they completely dissociate.

Statistical Analysis

Supplementary statistic (average and SD) that belong to skier within research are made. T test is applied for comparison of biochemical and hemogram values th at are taken before and after sprint exercises. In the analysis of research data SPSS 11.5 statistic program is used.

Symptoms

Table 1: Age (year), height (cm) and weight (kg) values of football players.

	N	Minimum	Maximum	Average
AGE		19.00	30.00	23.53 □ 3.6
HEIGHT	18	1.60	1.83	1.73 □ 0.05
WEIGHT		60.00	75.00	67.84 □ 5.1

Table 2: Serum NO (U/ml) levels of football players before and after the performance test that have done before the bimonthly practice.

	N		X ± SD	T	P
Serum NO U/ml	18	**Pre**	25.59±1.59	2.216	.041
		Post	19.62±2.07		

Before the speed test the NO level of serum is 25.59 □ 1.5 and after the speed test the NO level of serum is 19.62 □ 2.07. This decline of serum level is not statistically meaningful (p>0.001).

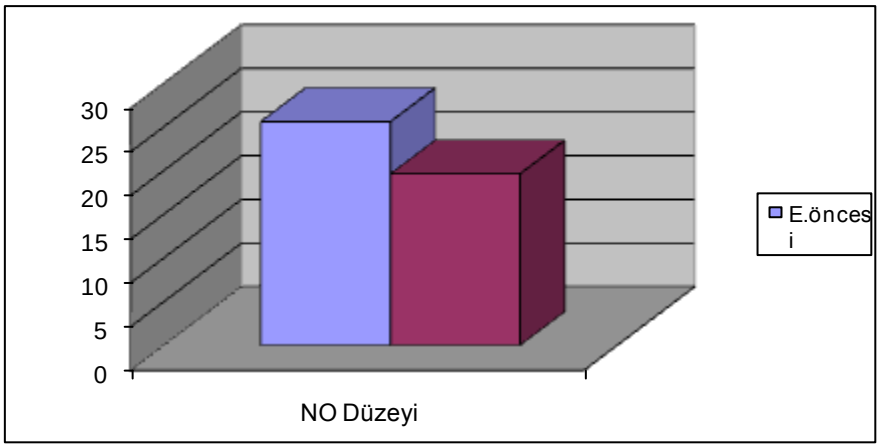

Figure 1: Serum NO (U/ml) levels of football players before and after the performance test that have done before the bimonthly practice.

In Table 2 and Figure 1 the NO levels of serums before the application of monthly exercise program before and after the speed test of our group which consist of football players are shown.

Table 3: Serum NO (U/ml) levels of football players before and after the performance test that have done after the bimonthly practice.

	N		X±SD	T	P
Serum NO U/ml	18	**Before**	14.83±1.37	1.374	.187
		After	11.79±1.30		

Before the speed test the NO level of serum is 14.8348 □1.36 and after the speed test the NO level of serum is 11.7881 □1.30. This decline of serum level is not statistically meaningful (p>0.001).

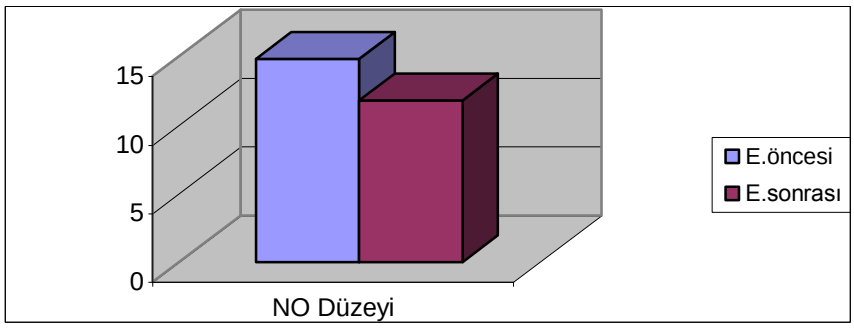

Figure 2: Serum NO (U/ml) levels of football players before and after the performance test that has done after the bimonthly practice.

In Table 3 and Figure 2 the NO levels of serums after the application of monthly exercise program before and after the speed test of our group which consist of football players are shown.

Discussion and result

In protection of structural entireness of cells and tissues and in performing their normal functions the protection of existing balance between oxidant and antioxidant system is very important. Protective antioxidant system remains incapable against oxidative stress that was raised extremely because of several diseases of organs and tissues or any other agents (like exercise). As a consequence of this situation, the illness advances and moreover, several complications come alog (A. Vliet, C. Cross, 2000).

In some studies, it is shown that there is a connection between the rise of oxygen consumption in physical exercise and the production of free radicals (B. Chance, H. Sies, A. Boveris, 1979).

For each 25 O_2 molecule that was reduced by normal respiration it is estimated that one free radical is produced (C. Sen, 1995).

The studies that have done in recent years, shows that there can be an increase in NO production with exercise and this increase can build up a protective effect on cardiovascular system in long term. With the revelation of NO, elasticity of veins augment and can play a role that prohibit the growth and function of atherosclerosis in endotheliums (Chandan K. S., 2000).

Balon and Nadler show that chronically exercise reduces the synthesis of nitric oxide in mices (T. Balon, J. Nadler, 1994).

Contractile activity increases NO production significantly in muscle. This increase that is related to contractile activity in NO production is seen to be related to increases in intracellular calcium levels. One of main effect of NO in musculoskeletal metabolism is increase in dispersion and perception of combustible substrates with the effect of vasodilator (M.S. Wolin, T.H. Hintze, W. Shen, Hk. M. Mohazzab And Y.W. Xie, 1997).

Christian and et al have indicated that nitric oxide synthesis increases in acute exercises in the study that they have done with mices. They also have told that NO have a key role for the transfer of blood sugar in musculoskeletals (K. Christian, R. Roberts, R. James Barnard, A. Jasman And Thomas W. Balon, 1999).

In the study that have done with rats, Perez and et al have found a meaningful increase in plasma nitrate values in accordance with control values after anaerobic exercises (C. Andrea, Perez. Cesar Cabral De Olıveıra Julıo G. Prıeto. Ana Ferrando, Luzdıvına Vıla Ana, I. Alvarez, 2002).

In the study that have done by Jungestern and et al they have compared long distance runners and students who don't do regular exercises and they found a meaningful difference in NO levels of long distance runners after exercise with respect to before the exercise. In the same study there is a meaningful increase in NO levels after doing exercise in accordance with the values that have measured with students who don't do regular exercises (S. Moncada, A. Higgs, R. Furchgott, Xiv, 1997).

In other study, it is seen that the handle of nitric oxide synthesis and active blood supply reduces after dynamic knee extensor exercises. In the same study, it is also seen that the handle of NO is greater in heavy exercises that in less severe exercises (S. Moncada, A. Higgs, R. Furchgott Xiv, 1997).

Radak and et al have expressed that it can be a damage in muscle depending on the increase in NO_x production in musculoskeletal during eccentric spasms. (H. Kurtuluş, S. Eskiocak, F. Tütüncüler, U.N. Başaran, Ş. Gülen, 2003). Cuzzolin and et al have done a study on 6 active and 6 inactive subjects and they emphasizes that acute exercises can cause the production of NOx (Z. Radak, S. Pucsok, T. Mecseki, P. Ferdinandy, 1999).

Jungersten and et al have found that, after a jogging exercises that have done by healthy groups who have different physical fitness levels (exercise capacity) during 2 hours, the plasma nitrate level of repose is very high in comparison with endurance athletes and sedentaries (L. Jungersten, A. Ambring, B. Wall, A. Wennmalm, 1999).

MaedaS and et al, have reported that there is an increase in plasma NO level after 8 week of exercises (3 times a week, in 70% max VO_2), a decrease in vasoconstrictor endothelin- 1 (ET-1) level and this situation continues after the exercises during 4 weeks (S. Maeda, T. Miyauchi, T. Kakiyama, J. Sugawara, et. all, 2001).

In the studies of Banfi and et al they have worked with 15 students from medical faculty and 44 elite football players as a sedentary control and NO values: aprx. 23,2 μM for KG; 58,0 μM for FG (G. Banfi, A. Malavazos, E. Iorio, Dolci A., Doneda L., Verna R., Corsi M., 2006).

Redegran G and Saltin B's works (G. Radegran, B. Saltin, 1960) show that NO value effect on basal vasculer tone and femoral arteria blood flood by %50-60 in addition to this after period of extreme can be helpful by %35.

In the study of Taş and partners; they have announced that there is a fall in nitric acid level after speed exercises during 4 week (3 day a week, 60 minute a day) (M. Taş, F. Kiyici, F.N. Kishali, 2008).

As a result, doing regular exercise bring the production of NO to more powerful levels and relieve cardiovascular system. Just after the maximal exercises that fatigue body, NO defense can be reduced. But although the fall of NO levels an increase in break period can be supposed.

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THE OCCURRENCE OF MUSCLE DAMAGE IN MALE SOCCER PLAYERS

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ABSTRACT

The purpose of this study is to determine the occurrence of muscle damage in male footballers during the game.

A total of 13 amateur soccer players with an average age of 25.23 $\pm$ 5.36 years were participated in to this study..

Six times blood samples were taken from the participants as before the match at rest , at half time, at the end of the match and at 24, 48 and 72 hours after the match in order to determine the CK, CK-MB, CK-MM and Myoglobine values .

It was observed that the pre match CK-MB and CK-MM values were significantly lower than those observed for half time, end of the mach , just 24, 48 and 72 hours after the match which indicate the muscle damage of the players during the match ($p<0.05$). The myoglobine , CK, CK-MB and CK-MM values showed a significant increase in half time and after the match ($p<0.05$) and myoglobine level assumed the resting values 24 after the match. However the CK, CK-MB and CK-MM did not to assume their normal values even after 72 hours after the match and the difference between these respective values was statistically significant.

As conclusion; significant amount of muscle damage was observed in soccer players during the match.

Keywords: Muscle Damage, Soccer, Creatine Kinaze.

Introduction

The number of studies related to the muscle damage caused by exercise at different intensities has shown a rapid increase in recent years. They are mainly focused on the determination of the damage caused on skeleton muscles**. (**P.M. Clarkson, M.J. Hubal, 2002, D.J. Newham, D.A. Jones, 1986, K, Nosaka P.M. Clarkson, 1997, H.K. Vincent, K.R. Vincent, 1997, J.B. Shumate, M.H. Broke, J.E. Carroll, J.E. Davis, 1979, C.M, Schneider C.A. Dennehy, S.J Rodearmael, J.R Hayvard, 1995).

Muscle damage is an acute situation which cause exhaustion, loss of functionality, loss of strength and pain in muscles as a result of unaccustomed and intensive exercise **(**P.M. Clarkson, M.J. Hubal, 2002). Although skeleton muscle damage is related to the intensity and volume of training it is much more apparent after unaccustomed exercise.

Damage in skeleton muscles results in the diffusion of the muscles specific components from the membrane to the blood circulation system. The components used in the determination of the skeleton and heart muscle damage are mainly Creatine Kinase (CK) and its sub isoforms (CK-MB, CK-MM), myoglobine, aspartate aminotransferase (AST), laktate dehiyrogenase (LDH), brain natriuretic peptide (BNP), atrial natriuretic peptide (ANP), carbonic anhydrase, troponine and muscle constrictive proteins . Among these components the most important and the widely used one is CK. CK is the enzyme which renews ATP consumed in the contraction and transport cycles of muscles. CK becomes physiologically active in muscle cells. ATP is formed from creatine phosphate in

contraction cycle of the muscle. This keeps the ATP level of the muscle constant. CK acts as a catalyst in this reversible reaction. (R.K. Murray, D.K. Granner, P.A. Mayes, V.W. Podvar; 1998). The peak time of CK level after the exercise depends upon the type, intensity and the duration of the exercise It is reported in literature that the CK level reaches to its peak value 1-5 days after the exercise (Sr.,Staron S.,Hikita 2000, C.M, Schneider C.A. Dennehy, S.J Rodearmael, J.R Hayvard, 1995, H.K. Vincent, K.R. Vincent, 1997, P.M. Clarkson, W.C. Byrnes, K.M. Mccormick, L.P. Turcotte, J.S White, 1986, D.J. Newham, D.A. Jones, 1986).

In a study the CK level reached to its maximum value 3-4 days after leg resistance exercise (H.K. Vincent, K.R. Vincent, 1997, Clarkson et. al ,1986), applied eccentric contraction to the leg flexors to young and elderly women and determined their CK levels. It was observed that the CK levels of the elderly women remained high even at the 5th day after the exercise while the levels of the young women showed a decrease (P.M. Clarkson, W.C. Byrnes, K.M. Mccormick, L.P. Turcotte, J.S White, 1986). In another study post race serum CK levels of the marathon runners were found to be 21 times higher than its resting value and came back to their normal values 4 days after the competition (C.M, Schneider C.A. Dennehy, S.J Rodearmael, J.R Hayvard, 1995).

Damage in both the skeleton and hearth muscles is highly undesirable. During a 90-minute game, elite-level players run about 10 km at an average intensity close to the anaerobic threshold (80-90% of maximal heart rate). Within this context, numerous explosive bursts of activity are required, including jumping, kicking, tackling, turning, sprinting, changing pace, and sustaining forceful contractions to maintain balance and control of the ball against defensive pressure (T. Stolen, K. Chamari, C. Castagna, U. Wisloff, 2005). In literature the number of studies related to this subject is highly limited. This study is related to the determination of the muscle damage of male soccer players throughout the game.

Methods

This study was carried out to determine the muscle damage in male soccer players throughout the game. A total of 13 players with an average age of 25.23 $\pm$ 5.36 years, an experience of 8.92 $\pm$ 4.75 years, height of 174.00 $\pm$ 7.55 cm and body weight of 68.77 $\pm$ 4.55 kg in two different teams in Erzurum Super Amateur league were voluntarily participated in to this study.

There were 13 players selected from the players who played in the whole game between Erzurum Sağlık Spor and Erzurum Palandöken Spor which determined the runners up place in Erzurum Super Amateur league. There were 6 venous blood samples collected from the arms of the participants at rest , in half time , at the end of the match, 24, 48 and 72 hours after the game in order to determine serum CK, CK-MB, CK-MM and myoglobine levels.

The collected blood samples were immediately transferred to the laboratory where they were centrifuged to separate their serums. Then they were subjected to total C ,CK- MB and CK- MM with the use of radiodiagnostic kit of the Hitachi brand auto analyzer.

The myoglobine analysis was carried out with Immulite One 2000 apparatus .

The data analyses were carried out by SPSS 10.0 statistical software. All the data were subjected to Kolmogorov–Smirnov test to test the normality. Non-parametric Friedmen test were applied to non normal values to determine the difference .Multi comparative Benforoni test was employed in order to determine the source of the difference.

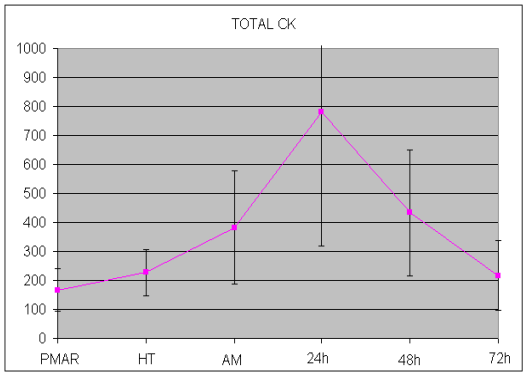
The significance level was taken as 0.05.

Results

Table 1. Physical parameters of the players

Parame-ters	Age (year)	Experience (year)	Height (cm)	Body weight (kg)
N=13	25.23±5.36	8.92±4.75	174±7.55	68.77±4.55

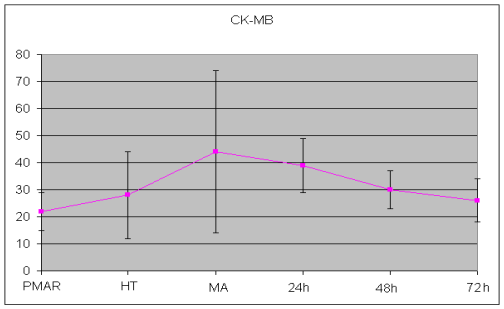
Figure 1. Total CK (U/L) values of the participants



PMAR: Pre-match at rest , HT:Half time , AM: After the match , 24h: 24 hours after the match , 48h: 48 hours after the match, 72 h: 72 hours after the match.

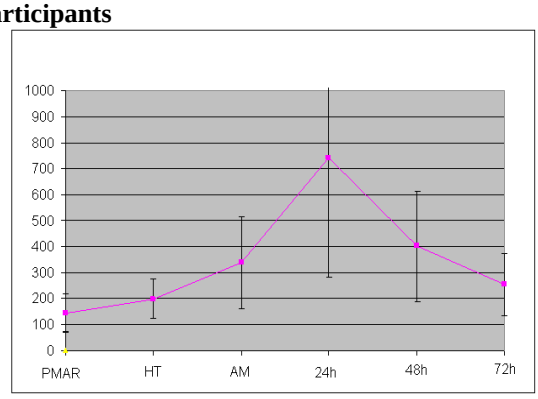
The total CK values of the participants were PMAR: 167.15±73.93 U/L, HT: 227.84±79.86 U/L, AM: 382.77±196.96 U/L, 24h: 781.69±462.90 U/L, 48h: 433.00±216.10 U/L, 72h: 280.53±120.81 U/L . There were statistically significant differences among PMAR, HT, AM , 24h,48h and 72h CK values of the participants ($p<0.05$) . There were statistically significant differences between HT and AM, between 24h and 48h values , between AM and 24h values , between 24h and 72h values and between 48h and 72 h values ($p<0.05$).

Figure 2. CK-MB (U/L) mean values of the participants



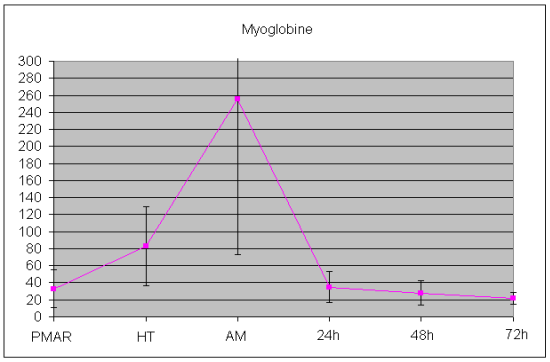
PMAR: Pre-match at rest , HT:Half time , AM: After the match , 24h: 24 hours after the match , 48h: 48 hours after the match, 72 h: 72 hours after the match. The CK-MB values of the participants were as follows :PMAR:22.24±7.75 U/L, HT: 28.16±16.91 U/L, AM: 44.33±30.09 U/L, 24h: 39.15±10.18 U/L, 48h: 30.34±7.75 U/L, and 72h: 26.31±8.85 U/L.When we look at the differences between CK-MB measurements of the participants there were statistically significant differences between PMAR and 24h values, between 48 h values and 24h and between 48 h and 72 h values ($p<0.05$)

Figure 3. Mean CK-MM (U/L) values of the participants



PMAR: Pre-match at rest , HT:Half time , AM: After the match , 24h: 24 hours after the match , 48h: 48 hours after the match, 72 h: 72 hours after the match. The CK-MM values of the participants were found as 145.84±74.29 U/L for PMAR, 199.68±76.45 U/L for HT, 338.39±177.40 U/L for AM , 742.54±459.67 U/L for 24h , 402.66±213.12 U/L for 48h and 254.23±119.19 U/L for 72h . There were statistically significant changes observed in PMAR and HT, AM, 24h, 48h and 72h CK-MM values of the participants ($p<0.05$). There were statistically significant differences between HT and AM, 24h and 48h values , between AM and 24h values, between 24h and 72h values and between 48h and 72h values ($p<0.05$).

Figure 4. Mean myoglobin (ng/dl) values of the participants



PMAR: Pre-match at rest, HT:Half time , AM: After the match , 24h: 24 hours after the match , 48h: 48 hours after the match, 72 h: 72 hours after the match. The mean myoglobine values of the participants were found as follows : PMAR: 33.49±22.93 ng/dl, HT: 83.82±46.82 ng/dl, AM: 256.27±183.74 ng/dl, 24h: 35.13±18.39 ng/dl, 48h:28.28±14.97 ng/dl and 72h: 22.98±7.31 ng/dl . When we look at the man myoglobine values of the participants we see that there were statistically significant differences between PMAR and HT and AM values , between HT and AM,24h,48h and 72 h ,between AM and 24h, 48 h and 72h values ($p<0.05$).

Discussion

The mean total CK values of the participants were found as 167.15 ± 73.93 U/L, for PMAR, 227.84 ± 79.86 U/L for HT , 382.77 ± 196.96 U/L for AM , 781.69 ± 462.90 U/L for 24, 433.00 ± 216.10 U/L for 48h and 280.53 ± 120.81 U/L for 72h (figure 1) .There were statistically significant differences among PMAR, HT, AM , 24h,48h and 72h CK values of the participants ($p<0.05$). There were statistically significant differences between HT and AM, between 24h and 48 h values , between AM and 24h values , between 24h and 72h values and between 48h and 72 values ($p<0.05$). The peak time of the increasing CK level after the exercise depends upon the type, intensity and the duration of the exercise It is reported in literature that the CK level reaches to its peak value 1-5 days after the exercise Sr.,Staron S.,Hikita 2000, C.M, Schneider C.A. Dennehy, S.J Rodearmael, J.R Hayvard, 1995, H.K. Vincent, K.R. Vincent, 1997, . P.M. Clarkson, W.C. Byrnes, K.M. Mccormick, L.P. Turcotte, J.S White, 1986, D.J. Newham, D.A. Jones, R.H. Edvards, 1986. In a study the CK level reached to its maximum value 3-4 days after leg resistance exercise (H.K. Vincent, K.R. Vincent, 1997). Clarkson et. Al, 1986, applied eccentric contraction to the leg flexors to young and elderly women and determined their CK levels. It was observed that the CK levels of the elderly women remained high even at the 5th day after the exercise while the levels of the young women showed a decrease (P.M. Clarkson, W.C. Byrnes, K.M.

Mccormick, L.P. Turcotte, J.S White, 1986). In another study the post race serum CK levels of the marathon runners were found to be 21 times higher than its original value and came back to their normal values 4 days after the competition [4]. In another study of Clarkson et al P.M. Clarkson, K. Nosaka, B Braun, 1992, the serum CK level was found to increase after a prolonged exercise and reached to its peak value 24-48 hours after the exercise. (Noakes T.D. Noakes, 1987) also observed the same results in a similar study. In our study the CK levels were found to increase after the exercise and reached its peak value 24 hour after the exercise .These results are parallel with the literature data. The fact that pre-match at rest (PMAR) CK values were found to increase at half time, just after the match and 24, 48 and 72 hours after the match shows that there was muscle damage in the players during the mach. The CK-MB values of the participants were as follows: PMAR:22.24±7.75 U/L, HT: 28.16±16.91 U/L, AM: 44.33±30.09 U/L, 24h: 39.15±10.18 U/L, 48h: 30.34±7.75 U/L, and 72h: 26.31±8.85 U/L (figure 2). When we look at the differences between CK-MB measurements of the participants there were statistically significant differences between PMAR and 24h and 48 h values, and 24h and 48 h and 72 h values, and between 48h and 72h ($p<0.05$). There are different results in literature related to exercise and troponin –t relation. There are studies reporting that exercise increases Tn-t ratio and results in myocardial damage (.F. Tucker, R.A. Collins, R. A. Anderson, 1994, S.P. Sayers, P.M. Clarkson, J. Lee, 2000). There are also studies indicating that exercise results an increase in the other chemicals related to the myocardial damage. However there are no changes in the specific Tn-t and the skeleton muscle damage is mainly related to the increase in other chemicals .(D, Konig Y.O Schumacher, L Heinrich, et al. 2003, S.Hazar, 2004, A.Bonetti, F. Tirelli, R. Albertini, et al, 1996, R.E Shave, E Dawson, P.G Whyte, et al. 2002). Hazar in his study reported that the maximal power and strength exercises caused no apparent myocardial damage and the increase in the CK-MB levels was not myocardial related and is mainly due to skeleton muscle damage (S.Hazar, 2004). In our study CK_-MB levels were found to increase after the exercise and it was mainly related to damage in skeleton muscles. The results were in good compliance with literature. The CK-MM values of the participants were found as 145.84±74.29 U/L for PMAR, 199.68±76.45 U/L for HT , 338.39±177.40 U/L for AM , 742.54±459.67 U/L for 24h , 402.66±213.12 U/L for 48h and 254.23±119.19 U/L for 72h (Figure 3). There were statistically significant changes observed in PMAR and HT, AM, 24h, 48h and 72h CK-MM values of the participants ($p<0.05$). There were statistically significant differences between HT and AM, 24h and 48h values, between AM and 24h values, between 24h and 72h values and between 48h and 72h values ($p<0.05$). It was reported that 99% of the total CK activity in the skeleton muscles was caused by CK-MM isoenzyme (C.M, Schneider C.A. Dennehy, S.J Rodearmael, J.R Hayvard, 1995). In a study carried out by Clarkson et al. 203 participants ranging 18 to 40 years in age were subjected hand flexor contraction exercises and it was found that the eccentric contraction caused an increase in CK-MM levels (P.M Clarkson, A.K Kearns, P. Rouzier,et al. 2006). In other studies he stated that CK-MM levels showed an increase 24, 48 and 72 hours after the exercise. P.M. Clarkson, K. Nosaka, B Braun, 1992, P.M. Clarkson, M.J. Hubal, 2002). The increase in total CK levels means the muscle damage .In a study investigating the muscle damage caused by maximal contraction in the elbow flexors, CK-MM levels were found to increase 3, 4 and 5 days after the exercise (K. Nosaka, P.M Clarkson, M.E Guiggin, et al. 1991). We also observed exercise related increases in the CK-MM levels of the participants. The significant increases in the CK-MM levels at the half time, just after the match and 24, 48 and 72 hours after the match compared those pre-match at rest values indicated muscle damage in soccer players. The mean myoglobine values of the participants were found as follows: PMAR: 33.49±22.93 ng/dl, HT: 83.82±46.82 ng/dl, AM: 256.27±183.74 ng/dl, 24h: 35.13±18.39 ng/dl, 48h:28.28±14.97 ng/dl and 72h: 22.98±7.31 ng/dl (Figure 4).When we look at the mean myoglobine values of the participants we see that there were statistically significant differences between PMAR and HT and AM values , between HT and AM, 24h, 48h and 72 h values and between AM and 24h, 48 h and 72h values ($p<0.05$). In a similar study of Mikkelsen and (T.S. Mikkelsen P.Toft , 2005), myoglobine levels made a peak just after the muscle damage and before the CK values. The fact that the pre-match concentrations of the myoglobine were lower than those observed at half time and just after the match was the clear indication of the muscle damage. However it assumed its original values 24 hours after the match. **In conclusion** there is a significant muscle damage caused in the players during the match.

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❖ KINETOTHERAPY

THE EFFECT OF EXERCISE FOR EIGHT WEEKS ON POSTURAL DEFECTS İN FEMALE'S

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ABSTRACT

Objective: this research has been made to analyse the efect of exercise on postural physique in Konya. In this research; 35 women who are between 20 and 40 and have not been interested in sport and are chosen with random sampling method, are used.

Method: the hypertrophic measures of women has been taken by using accurate tape measure and glass plaque has been used to analyse posture. After analysing anomanies in anatomics of participans, the reformatory exercise protocol has been prepared and put into practise for 8 weeks. On the evaluation of data, SPSS (statistical package for social sciences) packet programme hes been used and by applying paried sample t test, the measures that are taken before and after exercise have been compared.

Results: while the average of sitlional width was 44,77≠3,65 before exercise , it has become 43,52≠3,47 after exercise. While the average of Bithorachonterik width was 29,3≠3,2 before exercise, it has become 26,67≠3,27 after exercise. While the average of abdominal width was 18,64≠4,14 before exercise, it has become 18,01≠6,27 after the exercise. While the average of the extensive hip area was 78,05≠6,01, it has become 94,29≠5,64. while the average of abdominal area was 93,97≠8,91 before exercise, it has become 90,82≠8,24 after the exercise. The results are expressive statistically.($p<0,05$)

Discussions and Conclusion: some differences which are apt to characteristic of exercises, in muscles have been seen.With the conscious and regular exercises, both adscititious weights are losen and also these anomalies are reduced at the result of the exercise protocol for eight weeks.Moreover, if they attempt more,the anomalies can disappear.

Key Words: exercise, posture, women.

Introduction Posture is the pose shape of body parts with each other.It is also component of all parts at any time (F. P. Kendall, E.K. Mc Ceary, P. G. Provance, 1993). Posture is related not only with normal or pathology but also with gravity (A. Livanelioğlu, S. Otman, 1994).

Genetic, Anatomical, Physiological, Cultural, Peripheral,Vocational, Technological and Emotional State affects posture.Furthermore, clothing,nutrition and gender can affect posture. The most important matter is postural mistake that occurs at the result of false habits and philistinism (B. Leveau, Berndehart, 1984, N. Teymori, 1992, R. Cailliet, 1992).

Ligaments and muscles must be in balance for correct posture.The imbalance in disordered posture causes pain with tiresome, assymmetry in skeleton and nociceptive alerts.(pressure on definite nevre fibres). Weight diffuses to all parts of the body,shock is absorbed,explicitness of action is kept ande necessary actions for stability and mobility are controlled independently with the correct posture (J. Seghers, A. Jochem, A. Shaepen, 2003).

The aim of this research is to search the local and total structural changes in women who go to gyms to lose weight, at the result of the exercise protocol that is perpared apt to their individual states.

Method And Procedures

Women,between 20-40 ages,participated to the research volunteerly in Konya.They have not been interested in sports before and they were chosen with sample method.The hypertrophic measures of women were taken by using accurate tape measure and glass plaque were used to analyse posture. In the light of the data, each participant put into practice the exercise for eight weeks that is prepared for their postural structure and according to intensity of structural anomaly. The eight weeks' exercise is three days in a week and it is from easy to hard.

In the evaluation of data SPSS (statistical package for social sciences) package programme is used and by applying paried sample t test measures taht are taken before and after the exercises have been compared.

Results

Table 1: The Average of Women's Width and Height Measurements before and after Exercise and Statistical Values

	N = 35	SD	Before exercise X ±Ss	SD	After exercise X ±Ss	Difference	t	P
1	Height	3	1,61±5,43	3	1,61±5,43	0,00	1,00	0,324
2	Weight	5	64,36±10,32	5	61,12±9,93	3,24	1,43	0,160
3	Width of hip	3	34,10±3,03	3	32,04±2,84	2,06	0,94	0,353
4	Olecrenal width	3	42,34±3,73	3	41,05±3,32	1,29	0,00	1,000
5	Sıtlıonel width	3	44,77±3,65	3	43,52±3,47	1,25	10,27	0,000*
6	Caput fibular width	2	24,55±2,15	2	23,58±1,99	0,97	2,38	0,023*
7	Bıthorachanteric width	3	29,3±3,12	3	26,67±3,27	2,63	4,01	0,000*
8	Abdominalwidth	2	18,64±4,14	2	18,01±6,27	0,63	7,21	0,000*
9	Abdominal depth	2	22,97±3,68	2	20,55±3,44	2,42	0,00	1,000
10	Distancebetween malleols	1	16,98±1,62	1	16,70±1,64	0,28	3,94	0,000*
11	Distancebetween first metatorcells	2	15,80±1,54	2	15,62±1,58	0,18	2,095	0,044

Table 2: Women's Hypertrophic Measurements Values Before and after the Exercise

N = 35		SD	Before exercise X ±Ss	SD	After exercise X ±Ss	Difference	t	P
1	Average of femur zone	3	55,35±3,96	3	52,98±3,83	2,37	-1,40	0,169
2	Average of tibia zone left	2	35,35±2,98	2	34,64±2,84	0,71	-0,29	0,768
3	Average of tibia zone right	2	35,97±2,89	2	34,77±2,79	1,2	0,57	0,571
4	Widest hip zone.	3	98,05±6,06	3	94,92±5,64	3,13	5,56	0,000*
5	Crotch zone left	3	62,22±5,15	3	60,11±4,85	2,11	1,07	0,292
6	Crotch zone right	3	62,21±5,52	3	60,27±4,80	1,94	-4,36	0,000*
7	Knee zone left	2	37,28±2,76	2	36,37±2,69	0,91	-1,35	0,183
8	Knee zone right	2	37,45±3,11	2	36,47±2,65	0,98	2,91	0,006*
9	Abdominal zone	3	93,97±8,91	3	90,82±8,24	3,15	-7,93	0,000*
10	Intra mamills zone	3	91,28±7,68	3	89,11±7,30	2,17	-0,42	0,676
11	Hip zone	4	104,02±7,95	4	100,58±7,38	3,44	1,97	0,057
12	Breast zone	2	78,98±8,06	2	77,28±7,29	1,7	5,38	0,000*

*P<0.005

Discussion

In this study, at the result of the exercise protocol, according to Table 1; while the average values of body weight before exercise was 48,00±92,00, after exercise it has become 46,00±88,00 and the odds is 3,24 kg.Although there is a definite difference between the averages, the result is found meaningless statistically.p>0.005. It is thought that the reduction of difference between the averages represents the reduction of the rate of lipid in the body and the lose of weight thanks to exercise.It is told that while the rate of lipid in the body is reducing with exercise, the mass of muscles that occurs as a result of hypertrophe, increases(Y. Kaya, 2003).

In Table 1, while the Sitlional width measures of subjects was 44,77±3,65 before the exercise,it has become 43,52±3,47 and the odds is 1.25 cm.It is seen that results are expressive (p<0,005). The difference between the findings is suitable with the study of Kaya (1991) and it is thought that the reductions result from the adductor's closing up to the upper extremite to the body (Y. Kaya, 2001).

When we look at the averages of Bithorachanteric width, while they were 29,3±3,12 before the exercise, they have become 26,67±3,27 and the odds is 2,63 (Table 1). The results look expressive statistically. (p<0,05).It is thought that the reduction of Bithorachanteric width results from the reduction of soft fibres like lipid on trochanter majors.

In Table 2, it is seen that while the average of the widest hip zone was 98,05±6,06 before practice, it has become 94,92±5,64 and the odds is 3,13. The results are important stastically. (p<0,05). It is defined that since the most convenient zone which lipid fibres maximal occurs in women,at the same time because of exercise, hypertrophe can ocur and lipid fibres can turn into muscle fibres and the practice increases effiency. Leon et all. (2007), have determined that at the researches on sedentary women and the ones who are not interested in sports there is an essential and statistical differency in hip width before and after exercise. It shows parallelism with the study.

InTable 2, the average of crotch zone,leg zone right before exercise was 62,21±5,52. After the exercise, it has become 60,27±4,80 and the odds is 1,94. It is expressive statistically(p<0,05). The hypertrophic differency in right legs is less than left legs because the right legs are used more in daily life. The hypertrophe in the study and hypodermic lipid fibres' reduction can be related to this.At the same time the right of crotch zone leg zone, is being practiced more, in comparison with the left ones and for this reason it is important statistically.

It is seen clearly that the average of abdominal zone and the breast zone before exercise differentiate with the one after exercise.It is also important statistically (Table 2), (p<0,05).It is thought that the clear difference between the averages and its being important statistically result from subjects' losing weight and slimming after the exercise programme. Melinda et all. (2003) have determined in a research on women that,after the exercise, there are essential differences in the average and the percentage of abdominal zone (L. I. Melinda,Y. Yutaka Y., M. U., Cornelia B. Deborah, E.R. Rebecca, S.S. Robert, A. Michi Erin, D. P. John., A. McTiernan, 2003). They show parallelism with ths study.

Conclusions

As a result, when we look at the characteristic structuring of daily actions and most of the hypertrophic findings in the exercise, we see a lot of changes.

It is seen that some differences in muscles ocur apt to charasteristics of each exercise.It is thought that with the exercises that are standardized consciously and done regularly,over weights are losen and in paralel with this ,anomalies can be reduced. As a result of eight weeks' exercise protocol and if it is practiced longer, the anomallies disappear.

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NEW METHODS OF DATA AQUISITION AND WALKING ANALYSIS IN MULTIPLE SCLEROSIS AFTER FUNCTIONAL ELECTRICAL STIMULATION

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ABSTRACT

In multiple sclerosis the difficulty in walking represents one of the main patients concern. This difficulty is due to the instability of the muscles of the foot to lift it up during the swing phase of walking, known as dropped foot. Different alternatives in the rehabilitation treatment try to improve the walking, but at the present moment, in clinical medicine, scientific quantification and analysis of human walking mechanism is not highly accurate due to the lack of an objective analysis. Progress quantification in walking is essential in evaluation of the efficiency of reabilitation procedures, improvement of these procedures or elaboration of individual models for each patient..

Purpose

The purpose of the present research is represented by both the completion of a prospective study regarding efficiency of functional electrical stimulation in walking rehabilitation at patients with multiple sclerosis and the use of last generation non-invasive methods in analyzing and quantifying the results.

Methods

The present paper is a case report regarding the results obtained after application of functional electrical stimulation to a patient with multiple sclerosis. Functional electrical stimulation was applyed in order to stimulate muscular groups involved in walking by the use of a 2 channel neurostimulator (O2CHS II). The trigger points choosed for stimulation permitted to obtain dorsiflexion and eversion of the foot, associated with knee flexion. Acquisition and analysis of the data specific to walking (contact pressure, forces. moments) were made by using a pressure plate for static and dynamic measurements (RSSCAN) before and during stimulation.

Results

Registered by the pressure plate allowed identification and quantification of improvements of the patient`s walking problems by the use of electrical functional stimulation.

Conclusions

Functional electrical stimulation offers an alternative within the rehabilitation treatment in multiple sclerosis, by encouraging active movement of the food and by constantly taking the foot through the full range of movement with walking, and avoiding stiffening up of the ankle. Identification of certain analysis models in walking, will offer a viable instrument in evaluation and treatment of multiple sclerosis and sustainable results on national and international level.

Key words: multiple sclerosis, functional electrical stimulation, walking evaluation, plantar pressure

Introduction

Multiple sclerosis (MS) is a chronic neurological disease of unknown etiology which affects central nervous system, especially the brain, spine and optic nerves (A. Achiron and Y. Barak, 2000) and is characterised by demyelination of nerve fibers. Among clinical MS symptoms a common one is represented by motor and balance disorders: spasticity, muscular weakness and ataxia, decreased mobility (A.J..Lenman, F.M.Tulley, G. Vrbova et al, 1989). MS evolution is extremely variable and unforeseeable. In the absence of specific treatment, a percent of over 30% of MS patients will develop significant physical disability within 20-25 years since the onset of the disease. After 25 years only 1/3 of the patients are capable of working and 2/3 can walk (K.J. Aronson, 1996). But this prognosis is permanently changing due to the new therapies. Approaches nowadays focuse on the idea that MS treatment does not mean only drug administration, but also kinetotherapy, ergotherapy, consultance and psychological therapy.

MS rehabilitation treatment should focus on encouraging normal movements and functional activities, such as walking, which will facilitate and stimulate balance mechanisms. Unfortunately, as mentioned before, walking is affected in most of MS cases. Consequently, any procedure to improve motor

activity and walking is of high benefit. Functional electrical stimulation (FES) involves applying low level electrical current to the neuromuscular system for either functional or therapeutical purposes. Therapeutical applications of FES aim to impede or reverse the progression of a disabling condition, and are typically used to strenghten weak muscles, but also the patient can benefit of muscular activity maintainace and spasticity reduction. In most countries FES is a common treatment for the patients who suffered a stroke, but FES as treatment in multiple sclerosis is rare due to the lack of clinical documentation. The benefits of using electrical stimulation through FES in therapeutic purpose can be summarized as follows: improvement in muscular tonicity, preventing of muscular atrophy, increasing in muscular force (T.A. Fredriksen, S. Bergman, J.P. Hesselberg et al., 1986; M. Javidan, J. Elek, A. Prochazak., 1992**)**. By sequence activation of lower limb muscle groups a complex movement can be produced, similar to voluntary activities performed by the patient previous to demyielination in the nervous central system (J.H. Burridge. P. Taylor, S Hagan et al., 1997; J. H. Burridge, I.D. Swain, P.N. Taylor., 1998). At present, walking analysis is not highly accurate in clinical medicine due to the lack of an objective walking analysis (Bogey, 2004), including functional analysis of anatomic segments involved in walking activity. For the purpose of data collection and biomechanical modelling of human movement is highly necessary to measure the contact force (reaction) at the level of distal segment and the plantar pressures.

The research hypotheses

The efficiency of functional electrical stimulation within the rehabilitation treatment in MS will be shown by improvement of walking parameters, the most affected function in this disease. In order to obtain a correct scientific evaluation it is highly necessary to implement clinically methods in generation, standardization, data acquisition and analysis (walking analysis). Operational motivation in application of proposed non-invasive methods such as measurements of plantar pressures by pressure plates is given by the fact that the newest systems of measuring and scanning plantar pressures are capable not only of recording and analysing accurately plantar charge but also to predict the characteristics of rapid movements of the limb and shank.

Methods

As mentioned before, the purpose of the present research is the completion of a prospective study regarding efficiency of functional electrical stimulation in walking rehabilitation at patients with MS. The initial extended study includes 20 patients with MS, but the is not yet finished, so we choose to present some intermediary results regarding only one of the patients. So the present article represents a case report regarding the results obtained after application of FES to a patient with multiple sclerosis within the framework of previous mentioned study.

We mention that the study had obtained the written consent of the patients or of their families in the individual evaluation files. The Ethics Commissions of the University of Medicine and Pharmacy and of the other clinical units involved approved the studies in the project conform to the Order of the Ministry of Education and Research no. 400/22.02.2007. The patients were introduced in the study after the request and written consent of them or their families. They were informed of the study motivation, data used and respect of their confidentiality.

Subject. The patient data are summarised.:

General data: Pacient B.V. male; residence: urban; educational level: university; social status: married; family support: adequate; diagnosed in 2001 with MS, age at the disease onset: 35 years old; onset symptomatology: neuro-muscular fatigue; hereditary history: insignificant; physiological history: insignificant; pathological history: insignificant; disability level: incapacity to adapt 90%; remaining work capacity 10%.

Clinical neurological examination indicates motor disabilities represented by inexplicable fatigue, misunderstood by his family and friends, decrease of muscular force, especially at the level of lower limbs, pyramidal signs (spasticity, abnormal reflexes), walking disorders. Among sensitive findings there were recorded paresthesia and sensitive ataxia (a spastic ataxic walking).

Walking examination indicated disorders in walking, respectively crural motor bilateral deficiency, orthostatism and spastic/ paraparetic walking, crural pyramidal bilateral hypertonia, lower limbs clonoidia, RCA abolished, RCP-bilateral extension.

Paraclinical examinations indicated: glycemia 105 mg.dl; urea 29 mg/dl, cholesterol 208 mg/dl, triglycerides 45 mg/dl, HDLC 45 mg/dl, LDLC 154 mg/dl, GPT 18 U/L, VSH (1 h) 8 mm, VSH (2 h) 16 mm, WBC 13400, NeSe%= 67%, LY %=25%, MO%=5%, EO%=3%, Hb 13,8 g/100ml.

In 2003 and 2004 the patient was evaluated by magnetic resonance imaging (MRI). In 2003: MRI of head showed a hyperintensity centimetre lesion visible only in sagittal FLAIR sequence, (im.9.sc.5) deep in the white matter which may correspond to a focal degenerative lesion. There were no abnormalities of focal type in favour of MS diagnosis; ventricular system on medial line, cranial nerves, normally visible vascular structures. Investigations at the spine level were recommended.

In 2004: MRI of thoracic spine was performed, showing: vertebral bodies with homogenous signal without focal abnormalities or degenerating corporeal or disk processes. Thoracic spinal duct with normal dimensions (35 mm) without any symptom of extrinsic compression. Homogenous medullary thoracic parenchyma with AP diameter of 7 mm, without any abnormalities of focal signal or pathologic point of contrast substance.

Electrical functional stimulation

A 2 channel neurostimulator (O2CHS II) produced by the department of Medical Physics and Medical Engineering Salisbury was used for bilateral correction in walking. This is a neural prohtesis designed to improve walking, with 2 channels associated with a switch off device placed at the heel level to obtain dorsiflexion and foot eversion by stimulating extern sciatic popliteal nerve (SPE). The shank flexion could be performed depending on the electrodes placement. Electrical stimulation was realized by impulses of rectangular shape, using surface electrodes. In the case of muscles with intact motor neuron, stimulated by surface electrodes, the electric signal is a train of rectangular impulses of a frequency between 20 Hz and 40 Hz and a pulse duration between 5μs and 350 μs. Intensity of stimulation varied between 20 mA and 40 mA. Despite the fact that there was the possibility of using a current of a frequency up to 100 MA, it was taken into account the rapid fatigue of the stimulated muscle caused by the regulation of the parameters of current intensity and rectangular impulse duration.

Data aquisiton and analysis using pressure plates in static and dynamic regime

In our study we used a footscan plate scientific version, RSSCAN International, Olen, Belgium to record plantar pressure distribution and pressure values. In our experiment we used a plate of surface of 0,5m x 0,4m, with a total of 4096 sensitive pressure sensors (4 sensors per cm^2) which allows the measurement of vertical pressure. Data were recorded at a frequency of 50 Hz. The patient was asked to walk along the platform as natural as possible. The platform recorded forces and pressures along z axe in the above-mentioned areas in a file type Working Sheet Microsoft Excel. The measurements were made in the Centre of Research in Human Movement at the Faculty of Physical Education and Sport, University of Craiova.

As the sensor size is known (0,27cm) pressure is determined automatically. It is very important to perform the current measurement in a natural way. Therefore, the plate was placed in a normal route long enough to allow a normal walking, covered by a thin layer of EVA material. This material does not influence or alter the measurement, the route is comfortable for the patient and they do no not "target" the plate as it is invisible. The system permits automatic detection of left and right limb, static (at rest) or dynamic measurements (walking, running).

The studied parameters included:

- image of pressure distribution on both soles for each movement moment (each frame). These images were stocked in **bmp** format for each walking moment of the patient (each frame); dynamic pressures and center of pressure line; pressure/time for each foot zone.

- force values for each time unit for the 10 specific zones: halluxes (1), phalange (1), metacarpals (5), mediane zone (1), the two medial and lateral zone of calcaneus (2);

- mean pressure values for the 10 zones depending on time; surface of the 10 contact zones for each frame;

- specific angles (hallux valgus, open-close foot, etc) for each frame (depending on time).

- movement analysis: heel rotation, foot balance, medial forefoot balance, forefoot rotation, forefoot balance, meta loading, center of pressure line, center of pressure line of rearfoot, inversion – eversion, flexion – extension, hallux activity, hallux stiffness

The system allows visualization in different colours depending on the value of applied pressures; the graph force/time for each limb whenever necessary or desired; calculations such as: determination of foot dimension, comparison of two measurements sets, graph pressure/time for each limb zone, comparison of contact percentages or rear- mid- fore foot with the impulse of the respective foot parts, calculation of average in several measurements.

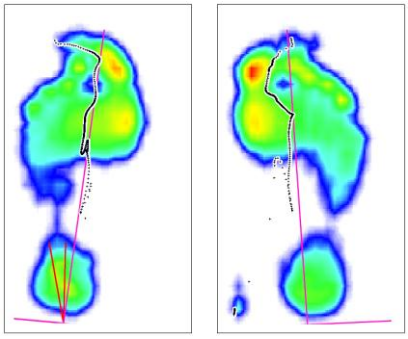
Data stocking: data obtained directly from the measurements and those processed by specific RSSCAN software for walking and balance are in Excel, depending on time and stocked in the computer in an integrated data basis.

Results

We could appreciate plantar pressure distribution in static and dynamic measurements for walking in a patient with MS, before and during FES (patient: V.B., age: 43 years old, 70 kg, foot size 42).

Recorded data were obtained directly from measurements or by processing of initial data by a specific RSSCAN software for the analysed movement.The data were automatically converted in Excel format, and mean values of recorded parameters were performed. The evolution of contact pressure depending on timing parameters and its distribution on characteristic anatomic plantar zones when the patient supported himself unilaterally and bilaterally during walking were also analysed.

Static measurements. Each foot was split into ten anatomical zones: medial and lateral zone under the rear foot, the midfoot, the five metatarsals, the hallux and the other toes. With this feature, the pressure under the foot can be linked to the relevant anatomical zones. In fig 1 is represented the distribution of contact pressures in stance phase for both lower limbs at ground contact, center of pressure and walking axis (red) towards walking direction (pink). in fig 2 is represented the normal distribution of plantar pressures in ratio with the 10 anatomic zones above-mentioned.. The magnitude of pressure distribution is shown based on a colour scale, blue representing the lowest pressure, red representing the highest pressure. Black represents absence of pressure. In comparation



a b

Fig. 1. Static picture of the pressure distribution under the patient's feet, while the patient is standing on the plate. Maximum pressure measured under the foot during stance phase can be observed (a) without FES; (b) with FES

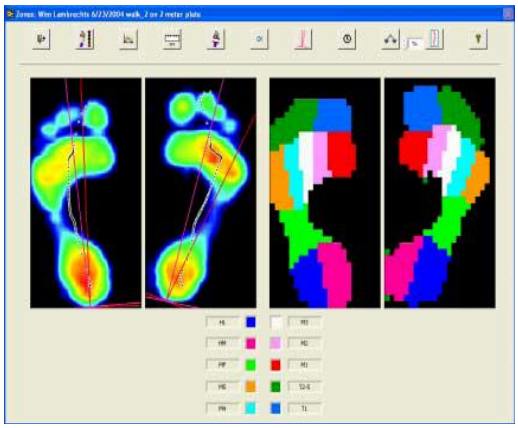
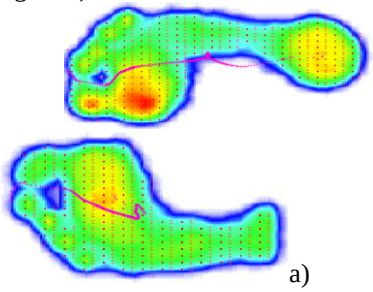


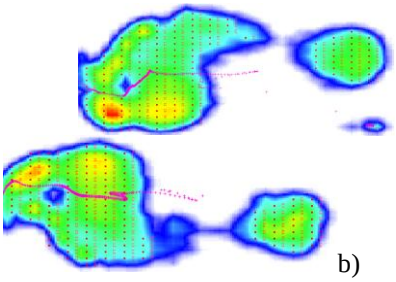
Fig.2. Normal distribution of plantar pressure for the 10 anatomical regions (static measurement)

HL: Heel Lateral
HM: Heel Medial
MF: Midfoot
M5: Metatarsal 5
M4: Metatarsal 4
M3: Metatarsal 3
M2: Metatarsal 2
M1: Metatarsal 1
T2-T5: Toe 2 to toe 5
T1: Hallux

Dynamic measur c
measurement captures the r
the patient's feet, in time over the full length of the step from the initial contact of the footscan plate until the end of the foot roll-off. The measurement was taken individually for each foot, recorded and the software proceeded the information. It detected the left and right limbs and placed them in corresponding graphs. (fig.3a.b).



a)



b)

Fig.3.Record of a single step in dynamics (a) without FES; (b) with FES

The dynamic image of the pressure during roll-off of the foot can be observed. The view loops continuously through all frames. The software calculates the values of contact pressure N/cm2 during one step, on each characteristic zone of the foot (the load rate). The load rate represents the speed of loading under the anatomical zones, in N/cm2 and can also be graphically presented in different points on the sole for both lower limbs. In our study we noticed the maximal pressure values for metatarsal zone M2 at the left foot, in comparison with the right foot, where contact pressure values are the highest, reaching 24N/cm2. We can also notice the positive influence of stimulation which leads to the decrease of maximal pressures to the value of 19N/cm2, which means that a greater surface of the foot is on ground contact; that means also a decrease of the stress in the foot.

The evolution of contact surface for both feet at 5 successive time moments from a step duration, without stimulation (a) and with stimulation (b) is presented in fig. 4 (timing parameters of significant events - a sequence of images from the roll-off of the foot, the timing for each image is indicated in milliseconds). We can notice the zones of maximum contact pressure which is in hallux and metatarsal zone 1 for the right limb and in metatarsal zone 3 without stressed pressure in the hallux or calcaneus for the left limb. We can also notice a correction in the distribution in both limbs but especially in the left one after stimulation, with the formation of plantar arch (disappearance of the contact in this zone). We can notice (in the case without stimulation) the great tendency of avoiding complete support on the left limb, and so there is not any zone with high pressure contact values (red); we can also observe the fact that the patient has ground contact with his calcaneous and metatarsal zones, the contact extending to plantar arch. When the left foot leaves the ground, the contact remains on metatarsal and phalangeal zones. At the right foot, the contact begins on the hallux, metatarsal 1 and calcaneous, completing on metatarsal and phalange, at its maximum on hallux/metatarsal. In case of stimulation, we can notice the rehabilitation of plantar arch at the left foot, correct distribution of pressures on anterior side and calcaneous. The system memorized to print inadequate times and that is why the results for the left foot seems incomplete.

a)

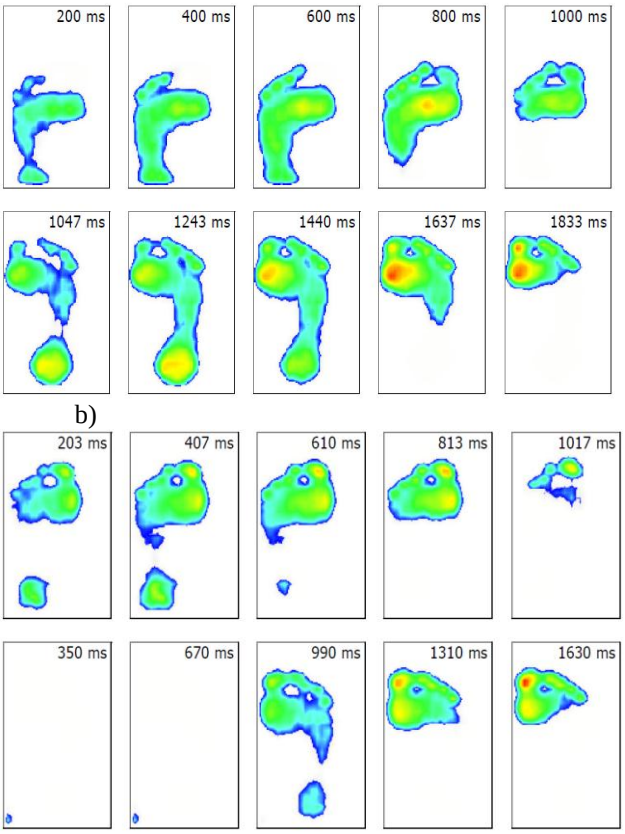


Fig.4. The graph of plantar contact surface in different walking moments (a) without FES; (b)with FES

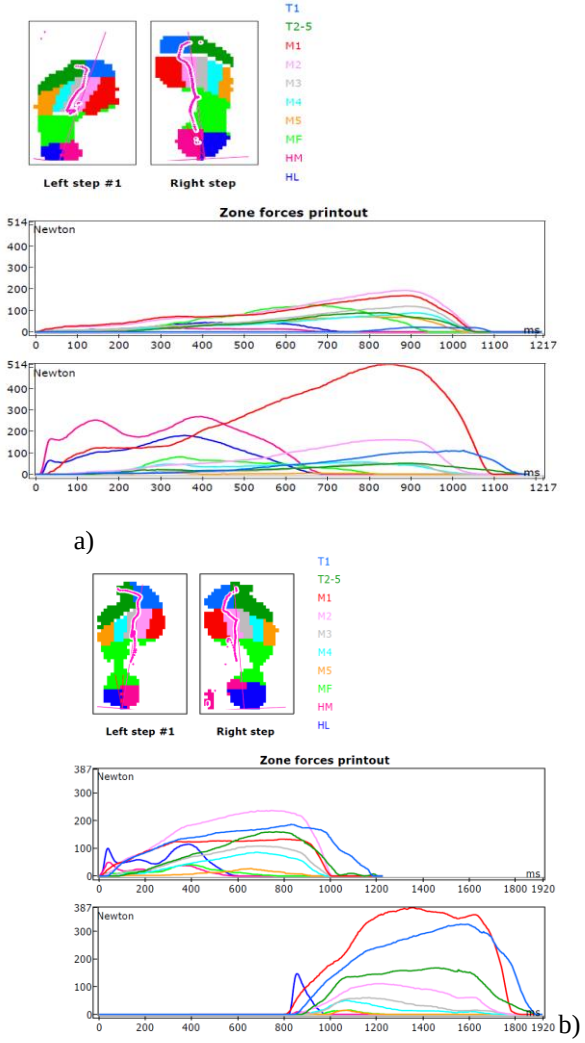
For each representation of the measured pressures there can be shown the measured forces as well (fig.5 a.b). The force curves show the vertical force in time during stance phase. The X-axis shows the time in ms (milliseconds), the Y-axis shows the force in N (Newton).

When the forces are shown the graph represents total force of the calculated zone. If the pressures are shown, then the force shown is divided on the surface in which it is applied. When the forces are shown we can click to see the calculated force.

Fig. 5. Graph: Force/time for each foot zone (a) without FES; (b) with FES associated with the forces graph. The graphs of the force (N) for each zone during foot contact can be observed. **The**

The contact percentages & foot axis printout shows the contact percentages under the foot, direct information over the exo and endo rotation from the foot and an indication on the rearfoot pronation. In fig. 6 a we can notice a use of only 12% for calcaneous in comparison with 19% for the right foot; for both feet anterior metatarsal/phalangeal zone is predominant in the contact. The impulse offers information of the most important zones in propulsion, they representing frontal part of the foot in both cases. The great angle of foot axe towards walking direction at the left foot shows the tendency of interior rotation. We can clearly notice the

The percentages in which total contact is divided on the sole, among anterior, medial and posterior zones of the foot represents the usage degree during the step (impulse) and it can be used to identify plantar zones of high charge.



graph of forces distribution is similar to that of pressures with maximal values of 514 N for M1 zone of the right foot.

improvement of the angles the foot makes in walking direction in the case with stimulation on (b), decreasing for both feet to 9.6, respectively 4.8 degrees

a)

In fig. 7 are also represented the representative moments and zones such as anterior zone, calcaneous or first/last contact, as well as the foot axes. The inapropriate negative values of the left foot show that the patient`s first contact is insecure, he cannot make the contact at first, but finally he can touch the ground with anterior side of his sole.

In the last figure we can notice that the last patient`s contact with the left foot does not fit to pressure centers; thus, we can conclude that the patient is insecure and after lifting his foot he reaches back in ground contact for another second due to lifting of foot to an insufficient height. This problem is corrected by stimulation (b), pressure center line is improving and the patient does not hesitate to lift his left foot any longer.

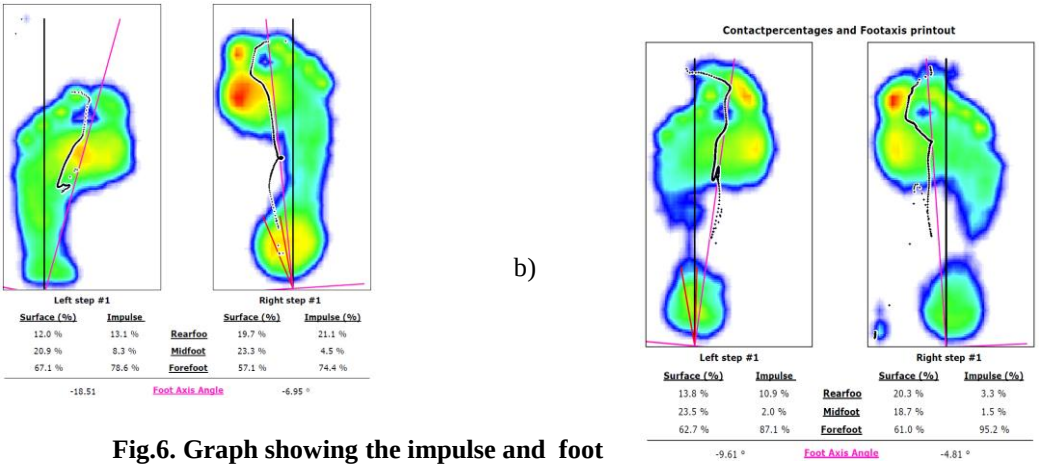
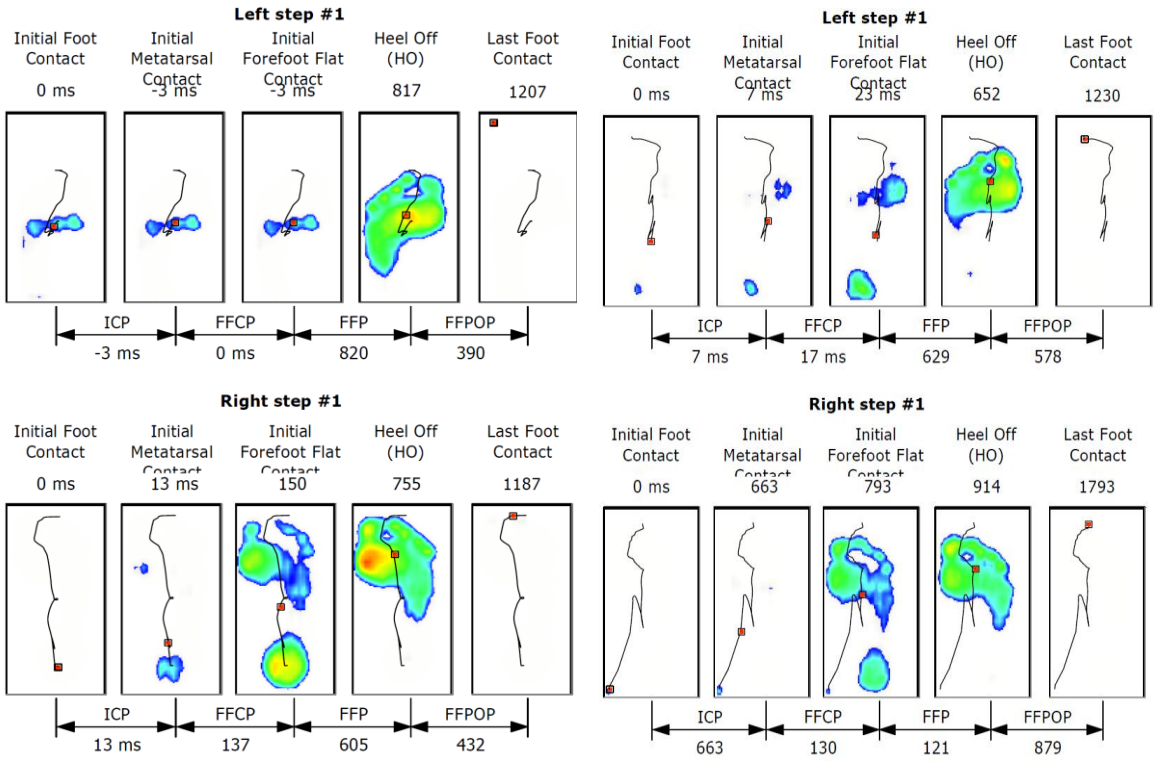


Fig.6. Graph showing the impulse and foot axis (a) without FES; (b) with FES



a) **b)**

Fig.7. Multisteps analyse mode (a) without FES; (b) with FES

This way of time measuring allows concentration on spatial and temporal parameters of and among different steps is called *multi-steps pattern*

The screen offers detailed information of different time parameters, both in milli-seconds and in percentages for the contact phase with calcaneous, initial contact with anterior part, complete contact or balance, propulsion. We can notice the exceed of normal values at the left foot in comparison with the right one, where the zones in which the values are higher are metatarsal 1-4. While stimulation, at the left foot the normal values are higher at the movement initiation as the patient has the tendency to keep ground contact with his left foot owing to muscular contraction following stimulation.

Subsequently, there was drawn a table with time standard values (table 1). The *timing table* lists the timing values according to the zones and the significant events during gait, compared to reference timing values.

Three colors are used to indicate the relation between the measured values and reference values

Blue: the timing parameter is early in time compared to the reference timing value.

Green: the timing parameter is within the range of the reference timing value. **Red**: the timing parameter is late in time compared to the reference value. This table evaluates (in comparison with normal values) the contact duration for the zones medial/lateral calcaneous, metatarsal 1/5 as well as the phases during walking and contact phase

Heelstrike (%): defined as the instant the heel region (HM-HL) first contacts the footscan® plate until one of the metatarsal heads contacts the footscan® plate.

Pre-Midstance (%): defined as the instant when one of the metatarsal heads contacts the footscan® plate until all the metatarsal heads made contact with the footscan® plate.

Midstance (%): defined as the first instant all the metatarsal heads made contact with the footscan® plate until the heel region lost contact with the footscan® plate.

Propulsion (%): defined as the instant the heel region lost contact with the footscan® plate until last contact of the foot on the footscan® plate.

Table 1. Timing values according to the zones and the significant events during gait, compared to reference timing values
(a) without FES; (b) with FES

a

		Start Time (%		End Time (%		Total Time (%		Peak Time (%		Impulse (%)
Left Foot										
Med heel	0	0.8	50-65	63.8	50-65	63.0	15-22	27.9	45-55	30.7
Lat heel	0	0.8	50-65	67.9	50-65	67.1	15-22	43.6	45-55	69.3
M1	13-25	0.0	73-96	88.5	60-83	88.5	50-78	71.2	13-21	27.5
M2	10-20	0.0	80-95	89.6	70-85	89.6	60-75	73.2	14-24	25.0
M3	8-16	0.0	85-93	88.8	77-85	88.8	59-74	73.4	15-23	15.6
M4	7-15	0.0	84-92	88.5	77-85	88.5	55-73	74.5	10-18	14.3
M5	5-15	0.3	65-87	87.9	60-82	87.7	50-77	72.3	4-11	17.6
Heelstrike	0	0.8	5-15	0.3	5-15	-0.5				
Pre-Midstance	5-15	0.3	10-20	67.9	45-55	67.7				
Midstance	10-20	0.3	55-65	67.9	42-52	67.7				
Propulsion	55-65	67.9	100	100.0	35-45	32.1				
Right Foot										
Med heel	0	0.0	50-65	63.5	50-65	63.5	15-22	11.8	45-55	63.2
Lat heel	0	0.6	50-65	62.1	50-65	61.5	15-22	28.9	45-55	36.8
M1	13-25	0.8	73-96	94.1	60-83	93.3	50-78	68.0	13-21	51.9
M2	10-20	1.4	80-95	93.3	70-85	91.9	60-75	67.1	14-24	21.5
M3	8-16	1.4	85-93	92.1	77-85	90.7	59-74	67.7	15-23	11.2
M4	7-15	1.1	84-92	92.1	77-85	91.0	55-73	65.2	10-18	13.9
M5	5-15	12.4	65-87	79.2	60-82	66.9	50-77	26.1	4-11	1.4
Heelstrike	0	0.0	5-15	0.8	5-15	0.8				
Pre-Midstance	5-15	0.8	10-20	63.6	45-55	62.8				
Midstance	10-20	12.4	55-65	63.6	42-52	51.2				
Propulsion	55-65	63.6	100	100.0	35-45	36.4				

Low Optimal High

b

Timing values printout

		Start Time (%		End Time (%		Total Time (%		Peak Time (%		Impulse (%)
Left Foot										
Med heel	0	0.0	50-65	50.7	50-65	50.7	15-22	3.5	45-55	34.7
Lat heel	0	0.0	50-65	53.1	50-65	53.1	15-22	31.2	45-55	65.3
M1	13-25	0.0	73-96	83.2	60-83	83.2	50-78	27.6	13-21	20.0
M2	10-20	0.0	80-95	85.4	70-85	85.4	60-75	55.6	14-24	37.0
M3	8-16	0.3	85-93	84.6	77-85	84.3	59-74	54.5	15-23	18.7
M4	7-15	0.3	84-92	83.7	77-85	83.5	55-73	54.7	10-18	16.6
M5	5-15	1.6	65-87	79.4	60-82	77.8	50-77	53.7	4-11	7.8
Heelstrike	0	0.0	5-15	0.3	5-15	0.3				
Pre-Midstance	5-15	0.3	10-20	53.0	45-55	52.7				
Midstance	10-20	1.6	55-65	53.0	42-52	51.4				
Propulsion	55-65	53.0	100	100.0	35-45	47.0				
Right Foot										
Med heel	0	6.6	50-65	52.1	50-65	45.5	15-22	45.3	45-55	47.5
Lat heel	0	42.0	50-65	54.2	50-65	12.2	15-22	44.8	45-55	52.5
M1	13-25	41.1	73-96	95.7	60-83	54.5	50-78	64.8	13-21	55.4
M2	10-20	41.3	80-95	93.8	70-85	52.4	60-75	62.0	14-24	23.4
M3	8-16	41.0	85-93	94.3	77-85	53.3	59-74	59.7	15-23	12.9
M4	7-15	41.3	84-92	92.5	77-85	51.2	55-73	56.1	10-18	7.7
M5	5-15	47.7	65-87	68.4	60-82	20.7	50-77	55.7	4-11	0.6
Heelstrike	0	6.6	5-15	41.0	5-15	34.4				
Pre-Midstance	5-15	41.0	10-20	54.2	45-55	13.2				
Midstance	10-20	47.7	55-65	54.2	42-52	6.5				
Propulsion	55-65	54.2	100	100.0	35-45	45.8				

Low Optimal High

Discussions and conclusions

Most research studies analyse the clinical pathology retrospectively using clinic and para-clinic parameters in an advanced evolutional stage of the disease. The modalities of approaching and evaluation presented in literature are usually chosen individually, without a common tendency based on trans-disciplinary research which will surely lead to better and faster results. That is why a complete research, associated with experimental studies based on corroboration of clinical data, characteristic for each specialty involved in functional rehabilitation program of the patient with MS, using computerized programs of movement analysis, will permit the creation of a complex system of data acquisition and analysis with direct application on human motility. Such a system (which can be standardized) will facilitate health cost reduction and social integration of patients with MS (economic and social effects).

In our study the records made using a pressure plate RSSCAN allowed identification of walking deficiencies such as: crural bilateral motor deficiency, orthostatism and para-paretic spastic walking. Credibility and validity of this method results from previous studies: *R.Darmana, M. Schandella, S. Salmeron et al., 2001; F. Hagman, 2003.*

The obtained data based on pressure measurements in the absence or presence of functional electrical stimulation lead us to the following conclusions:

- Functional electrical stimulation offers an alternative within the rehabilitation treatment in multiple sclerosis, encouraging active movement of the food and by constantly taking the foot through the full range of movement with walking, avoids stiffening up of the ankle.

- The study shows that clinical implementation of the 2 channel neuromuscular stimulator (O2CHS II) can improve walking in MS patients. The benefits of ES through FES in therapeutic purpose can be defined as improvement in muscular tonicity and a decrease in spasticity. Stimulation of the muscles in a certain succession can realize walking movements. In MS case, voluntary command of movement and tune is affected by the lesions of central motor neuron, without being affected motor peripheral neuron, neural and muscular junction or other muscular cells. FES used with sequence activation of muscular groups in order of natural contraction can correct walking. Therefore, FES can be used to correct walking in the rehabilitation process of the patients with MS.

As this reserch is presenting intermediary results from a wider study, we must say that at this moment the patients with MS do not show a "carry over" effect without using the stimulator. Further studies will be carried on.

- Evaluation of walking by biomechanical parameters as pressure and forces in lower limbs offers a complex method.

So far, in all research studies which reffer to FES use in neurologic rehabilitation, performances regarding walking improvement were quantified through two parameters: the speed of walking a distance of 10 m and PCI – physiologic cost index. These evaluations are relatively subjective, without offering a quantifying data system. Moreover, there are other aspects of walking which can not be mirrored by these evaluations. Identification of certain analysis model for the patients with MS that can be used before and after FES will represent a viable instrument to evaluate and treat this disease, with results at international level.

Correct evaluation of walking during therapeutic operation and establishing the objectives of rehabilitation program starting from clear data and clinic and para-clinic parameters will assure a better feed-back of therapeutic efficiency.

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THE EFFECT OF INJECTING ACUTE L-CARNITINE ON ENDURANCE TIME İN RATS EXPOSED TO DİFFERENT WATER TEMPERATURE

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ABSTRACT

Purpose: Carnitine plays an important role in lipid metabolism by transporting long-chain fatty acids into the mitochondria for beta-oxidation. The effect of carnitine on exercise capacity is not clear. The aim of this study was to explain effect of injecting acute L-Carnitine on endurance time in rats exposed to different water temperature.

Material and Methods: Six groups (E18°C, E28°C and E38°C groups made exhaustive swimming CE18°C, CE28°C and CE38°C groups given L-Carnitine and made exhaustive swimming exercises) were formed and a total of 36 Spraque Dawley male rats, weighing 250-300 g were used in this study. In the study, the L-Carnitine was given to the groups 1-1.5 hours before the exercises in the doses of 100 mg/kg by intraperitoneal (I.P.) way. Exhaustive swimming tests were made in a rectangle shaped glass water tank that was 80x60x60 cm^3. The uncoordinated movements and staying under the water for 10 seconds without swimming at the surface were accepted as the exhaustion criteria of the rats.

Results: In the rats of CE18°C group the endurance time increased significantly comparing with the E18°C ($P < 0.01$).There was not significantly different among other groups

Conclusion: This result suggests that carnitine may especially enhance the physical performance doing cold ambient. Carnitine might generate that effect by regulation lipid metabolism and mitocondrial functions.

Keywords: L-Carnitine; endurance time; Exercise; Rat;water temperature.

Introduction

Fat and carbohydrates are the primary metabolic fuels utilised by contracting skeletal muscles during exercise and resting (M.J. Watt, J.F. George, Dj. Heigenhauser, Dyck And L.S. Lawrence, 2002). Thus, it is not suprising that a variety of metabolic and biochemical markers is related to exercise performance and training. Manipulations of bioenergetics have frequently been proposed as strategies to enhance exercise endurance or capacity.The functions of carnitine in skeletal muscle are critical to sustaining normal bioenergetics during exercise (P.E. Brass, W.R. Hiatt, 1998).

L-carnitine (4-*N*-trimethyylammonium-3-hydroxybutyric acid), stored within skeletal muscle tissue as either free or acyl carnitine (F.B. Stephens, D.C. Teodosiu, D. Laithwaite, E.J. Simpson, And L. Paul, P.L. Greenhaff, 2006), is an endogeneus molecule well-established roles in metabolism (E.P. Brass, 2000), and plays important physiological roles shuttling the long-chain fatty acids across the inner mitochondrial membrane for ATP production and β-oxidation in peripheral tissues (İ. Gülçin, 2006). For health and performance the importance of mitochondrial function has been highlighted during the last few years (D. Hood, A. Joseph, 2005). It is well known that oxidation of fatty acids (FA) is augmented and lactate formation is reduced during exercise after endurance training. This is explained by an increased mitochondrial density in skeletal muscle and a concomitant increased activity of oxidative enzymes (J. Holloszy, E. Coyle, 1984).

Impairment of muscle contractility due to fatigue may play a role in determining human performance. Through unclear mechanisms, high carnitine concentrations were shown to delay muscle fatigue and permit improved maintenance of contractile force in studies using in vitro animal systems (M. Dubelaar, C. Lucas, W. Hulsmann, 1991; E. Brass, A. Scarrow, L. Ruff, K. Masterson, Van Lunteren, 1993). The relevance of these observations to human exercise is unknown.

Although some researchers declared that L-carnitine supplement, have benefitial effects on exercise performance (F.B. Stephens, D.C. Teodosiu, And P.L., Greenhaff, 2007; J.S. Volek, W.J. Kraemer, M.R. Rubın, A.L. Gomez, N.A. Ratamess, And P. Gaynor, 2002) the others, clained that taking carnitine before exercise have no effect on performance (C. Greigh, K. Finch, D. Jones, M. Cooper, A. Sargeant, C. Forte, 1987; J.W. Ransone, And R.G. Lefavi, 1997).

Normal body core temperature during exercise varies depending on enviromental conditions, such as the situation of training and acclimatization, the duration and intensity of exercise, and individual differences (H.N. Soultanakıs-Alıgıannı, 2003). During physicial exertion an understanding of thermoregulation is important in protecting athletes from injuries and in managing physicial performance under cold and heat conditions. Thermal stress combined with physical exertion may lead to rise in bady core temperature (C.L. Lim, C. Byrne, J.K. Lee, 2008; G.A. Khomenok, A. Hadid, O.P Bloom, R. Yanovich, T. Erlich, O.R. Tal, A. Peled, Y. Epstein, D.S. Moran, 2008). Many endogenic mechanisms serve in thermoregulation responces (T. Reilly, B. Drust and W. Gregson, 2006). However the literature limited knowledge related to the effects of L-carnitine on the exercise done hypothermic and hyperthermic ambient.

The aim of this study was to determine effect of injecting acute L-Carnitine on endurance time in rats made exhaustive swimming exercise in different water temperature, such as 18 °C, 28 °C and 38 °C.

Material and methods

Animals and Groups

In this study, 36 healthy Spraque Dawley male rats, weighing 250–300 g, 4–6 months of age, provided from Fırat University Experimental Animal Research Center (FUDDAM). The study was carried out in Atatürk University Research Center of Experiment Animals and the study was approved by the Ethical Committee of the Atatürk University (AUHADYEK, Ethical Committee Report No: 2008-51). Protocols used here were in accordance with Guidelines for Ethical Care of Atatürk University Research Center of Experiment Animals.

The rats were kept under special conditions and were sheltered in cages, each with 6 rats, at the room temperature (25^{o}C), supplying with food (Bayramoğlu Yem Sanayi, Erzurum, Turkey) and water for 12–hour day and night cyclus. The rats were divided into six equal groups. Group 1: The ones that made exhaustive swimming exercises at the temperature of 18°C (E18, n=6). Group 2: Group 2:The ones that made exhaustive swimming exercises at the temperature of 28 °C (E28, n=6), Group 3:The ones that performed exhaustive swimming exercises at the temperature of 38 °C (E38 n=6), Group 4: The ones that were given L-Carnitine and made exhaustive swimming exercises at the temperature of 18 °C (CE 18 n=6), Group 5: The ones that are given L-Carnitine and made exhaustive swimming exercises at the temperature of 28 °C (CE28 n=6), Group 6:The ones that are given L-Carnitine and made exhaustive swimming exercises at the temperature of 38 °C (CE38 n=6) .

Chemicals

L-carnitine was obtained from Sigma (Sigma-Aldrich GmbH, Sternheim, Germany). In the study, the L-Carnitine was given to the groups 1-1.5 hours before the exercises in the doses of 100 mg/kg by intraperitoneal (I.P.) way (U. Panjwani , L. Thakur, S. Singh, B. Amita, S. Singh, P. Banerjee, 2007).

Exercise Protocol

Maximal intensely tired swimming exercises were applied to exercise and L-Carnitine exercise groups in test group (n: 36).

Adaptation Training. For the rats to have adaptation, they were first made to have swimming exercise in a pool, 80 x 60 x 60 cm^3 for 5 minutes during 5 days in water temperature at 26-28^{o}C (This temperature is the most appropriate for rat metabolism). A resistance of 2200 V and a digital thermometer (GEMO, micro software and PID thermo controlled device) was used to warm up the pool. After swimming exercise, the rats were dried with towels, made to rest for 30 minutes at a warm place and taken to cages.

Exhausted Swimming Exercise. All the rats in exercise group were made swimming at 18 ^{o}C, 28 ^{o}C and 38^{o}C respectively until they felt tired. The uncoordinated movements and staying under the water for 10 seconds without swimming at the surface were accepted as the exhaustion criteria of the rats (R. Osorio, J. Christofani, V. Almeida, I. Picarro 2003).

Determination of temperatures

American Health Assembly (AHA), approved of normal body temperature as 36.5–37.2°C. The body temperature of rats is the same as those of humans. A naked person can keep body inner temperature fixed between 12.5°C and 55°C in dry weather (20). For the body to feel the heat depends on the temperature of the weather, moisture rate and wind rate. 26–30^{o}C is the optimal temperature for performance in water sports (21).

In this study the temperature was determined 10^{o}C more or less than average temperature 28^{o}C as optimal temperature for performance, under 10^{o}C hypotermic (18^{o}C), over 10^{o}C hipertermic (38^{o}C). In present study to determine temperature values of water, under 16^{o}C and over 38^{o}C posed risk for rats. The rats made to swim at 14 and 39^{o}C died and had severe complications in 5-10 minutes (three out of six).

Statistical Analysis

The experimental results were performed in triplicate. The data were recorded as mean ± standard deviation and analyzed by SPSS (version 11.5 for Windows 2000, SPSS Inc.). Differences between exercise and carnitine-exercise group was made using by Mann-Whitney U test. Analysis inside of Group was

made using by Kruskal -Wallis test and $p<0.05$ was regarded as significant.

Results

Endurance time (minute) betwen exercise and carnitine-exercise groups, taking place in equal water temperature was indicated in **Table 1.** With reference to, endurance time of CE18 group was significant higher than E18 group (P<0.01). When compared E28 group and CE28 group, CE28 group was obtained a increased, but it is wasn't significantly. Additionaly, endurance time wasn't significantly between CE38 group and E38 group.

Table 1. Comparison of endurance time (min.) betwen exercise and carnitine-exercise groups, taking place in equal water temperature.

Groups	*n*	*mean±sd*	*Z*	*P*
E18	6	92.00 ± 21.72	2.722	
CE18	6	139.00 ± 31.37*	0.006*	
E28	6	249.00 ± 42.46	1.761	
CE28	6	291.00 ± 35.16	0.078	
E38	6	97.00 ± 39.57	0.962	
CE38	6	75.00 ± 39.14	0.336	

(*)$P<0.01$

Endurance time (min.) among them exercise and carnitine-exercise groups was presented in **Table 2**. With reference to, endurance time of among exercise groups E28 group veiwed significantly a increase in accordance with E18 group and E38 group ($P<0.05$). If endurance time of among carnitine-exercise groups CE28 group was significant higher than CE18 group and CE38 group ($P<0.05$). Also, CE38 group was significantly lower than CE18 group($P<0.05$).

Table 2. Comparison of endurance time (min.) among them exercise and carnitine-exercise groups .

Groups	*Z*	*P*
E28* - E18	-2.201	.028*
E38 - E18	-.420	.674
E38 - E28*	-2.201	.028*
CE28* - CE18	-2.201	.028*
CE38* - CE18	-2.201	.028*
CE38 - CE28*	-2.201	.028*

(*)$P<0.05$

Discussion

Carnitine is an endogenous compound with well-established functions in cellular metabolism that are clearly important in muscle during exercise (S. Ahmad, H. Robertson, T. Golper, Et Al., 1990). An obligate for optimal mitochondrial fatty acid oxidation, it is a critical source of energy and also protects the cell from acyl-CoA accretion through the generation of acylcarnitines (E.P. Brass, 2000). Therefore, It is not surprising that the use of supplementary carnitine to improve physical performance has become widespread in recent years.

In this study, in rats given L- Carnitine was evaluate endurance time in exhaustive swimming exercise in different water temperature. According to obtained data, L- Carnitine stimulated endurance time at 18^{o}C of water temperature, although there wasn't sgnificantly in favour of L- Carnitine groups on endurance time between exercise and L-Carnitine exercise groups at 28^{o}C and 38^{o}C (**Table 1**). Also, Comparison of among them exercise groups and L-Carnitine exercise groups was determined effect of L-Carnitine at 18^{o}C (**Table 2**).

In the literature, there were different views with respect to the relationship between exercise performance and L- carnitine. Although there are some theoretical points favouring potential ergogenic effects of carnitine supplementation (O. Heinonen, J. Takala, 1994*;* H. Karlic, A. Lohninger, 1996), there is currently no scientific basis for healthy individuals or athletes to use carnitine supplementation to improve exercise performance. (O. Heinonen, 1996, C. Greigh, K. Finch D. Jones, M. Cooper, A. Sargeant, C. Forte, 1987; Christoph Stuessi *Æ* Pierre Hofer *Æ* Christian Meier Urs Boutellier. L., 2005).

Slipandi (N. Sılıprandı, F. Dılısa, G. Pıeralısı, P. Rıparı, F. Maccarı, R. Menabo, Ma. Gıamberardıno, 1990), and Vecchiet(L. Vecchıet, F. Dı Lısa, G. Pıeralısı, P. Rıparı, R. Menabo, M. Gıamberardıno, N. Sılıprandı, 1990) noted that ingested 2 g. L-Carnitine before 60 min. exercise decreased blood lactat and increased performance and strenght. Greig et al.(C. Greigh, K. Finch D. Jones, M. Cooper, A. Sargeant, C. Forte, 1987) declared that carnitine supplementation wasn't beneficial effect to exercise performance since the observed effects were small and inconsistent.

The reserches relevant to effect of L-Carnitine on endurance time in the literature are limited number. Likewise, Trappe et. al. (S. Trappe, D. Costill, B. Goodpaster, M. Vukovich, W. Fink, 1994), notifed that L-carnitine supplementation does not provide an ergogenic benefit in performance times in highly trained swimmers. Another study making on thirty-two male rats was pointed out that in exercise endurance time were no changes by supplementation in untrained animals, however endurance times were longer in long-trained supplemented animals than in long-trained non-supplemented.(E. Kim, H. Park, Y. Cha**,** 2004).

The thermoregulatory mechanisms play important roles in maintaining physiological homeostasis during rest and physical exercise. Physical exertion poses a challenge to thermoregulation by causing a substantial increase in metabolic heat production. However, within a non-thermolytic range,

the thermoregulatory mechanisms are capable of adapting to sustain physiological functions under these conditions (L. Chin Leong, C. Byrne, J. Lee, 2008).

Many endogenic mechanisms serve in thermoregulation responces (T. Reilly, B. Drust, And W. Gregson, 2006). However the literature knowledge related to the effects of L- carnitine on the exercise done hot and cold ambient. Jansens et al., (G.P.C. Janssens, J. Buyse, M. Seynaeve, E. Decuypere, And R.D. Wılde, 1998), announced that heat production has decreased in exercising pigeons after L-carnitine supplementation.

Skeleton muscles have used free fatty acids both at rest and during exercise. For this reason, L- Carnitine deficiency may cause to decrease in skeleton muscle functios and in exercise capacity, In humans, cold-induced thermogenesis is attributable to skeletal muscle contractile activity (U. Chu, M. Larsson, T. Moen, S. Rennard And L. Bjermer). Humans initiate this thermogenesis through involuntary shivering or by voluntarily modifying behavior, i.e., increasing physical activity . While certain animals exhibit an increased metabolic heat production by noncontracting tissue (brown adipose tissue) in response to cold exposure. İn cold ambient, in skeleton muscles increase using free fatty acids both at rest and during exercise (A. Strup, 1986; B. Cannon And J. Nedergaard, 2004). For this reason, L- Carnitine deficiency may cause to decrease in skeleton muscle functios and in exercise capacity (S. Gültük, A. Demirkazık, S. Erdal, T. Demir 2007). Exercise intolerance, carnitine palmitoyl-transferase enzyme deficiency (CPT II) has been postulated to depend on low - carbohitrate-high - fat diet, exhaustive exercise, fasting, hypothermia and insomnia (M. Orngreen, R. Ejstrup, J. Vissing, 2003), and especially, it created skeletal muscle damage (A. Gentılı, E. Lannella, F. Mascıopınto, M. Latrofa, L. Gıuntolı, S. Baroncını, 2008). Little is known about energy substrate metabolism and energy utilization in hibernating species under conditions of hypothermia and rewarming. Belke et al (D. Belke, L. Wang, G. Lopaschuk, 1997), reported that total energy substrate metabolic rates were greater in rat than ground squirrel hearts during hypothermia, despite a lower level of work being performed by the rat hearts, indicating that rat hearts are less efficient than ground squirrel hearts during hypothermia. Because of this reasons, in cold water - in view of improved heat production and energy metabolism- increased using fatty acids. this study may say that L- Carnitine supplement helped to energy output at 18^{o}C water temperature.

Conclusions

In conclusion, according to this study carnitine may especially enhance the physical performanc doing cold ambient. Carnitine might generate that effect by regulation lipid metabolism and mitocondrial functions. Effect of this study Carnitine will inform useful that to be supported by molecular trial and advanced reserches

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SOME DİFFERENCES IN PARAMETERS OF BONE MİNERAL METABOLİSM IN VARİOUS SPORT BRANCHES

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ABSTRACT

Objective

This study was carried out in order to compare the differences of laboratory parameters related to bone metabolism such as alkaline phosphatase (ALP), serum calcium (Ca), magnesium (Mg) and phosphorus (P), in various sport branches.

Material and Method

Serum alkaline phosphatase, calcium and phosphorus, and magnesium levels were measured in 23 skiers, 21 runners, 24 wrestlers, 20 handball, 21 soccers and 30 sedentary living healthy individual.

Results

The groups were matched according to age and sex. As expected, there were no significant differences according to age or the female-male ratio between the athletes and controls subjects ($p>0.05$).

Serum alkaline phosphatase (ALP), serum calcium (Ca), magnesium (Mg) and phosphorus (P) were determined in the athletes and the healthy control subjects. In all the athletes and controls, routine biochemical parameters including alkaline phosphatase (ALP), serum calcium (Ca), magnesium (Mg) and phosphorus (P) were within normal limits **(Table 1).** The wrestlers had lower levels of calcium compared to control subjects **($p<0,05$).** The runners and handball had higher levels of phosphatase compared to control subjects **($P<0,05$).** Other parameters had no significant difference between athletes and controls (Table 2).

Conclusion

When compared with control group, it has been found that wrestlers have low level of CA while runners and handball players have high level of P.

Key words*:* Serum alkaline phosphatase, calcium, magnesium, phosphorus and athletes.

Introduction

Serum alkaline phosphatase is a member of a family of zinc metalloprotein enzymes that function to split off a terminal phosphate group from an organic phosphate ester. This enzyme functions in an alkaline environment (optimum pH of 10). Alkaline Phosphatases are a group of enzymes found primarily the liver (isoenzyme ALP-1) and bone (isoenzyme ALP-2). The primary importance of measuring alkaline phosphatase is to check the possibility of bone disease or liver disease. For an adult, 50-75 mg/dl is considered a reasonable optimal range (O. Maldonado, R. Demasi , Y,Maldonado et al. 1998, N. McIntyre, S. Rosalki, 1991, AG,Lieverse, GG. van Essen, GJ, Beukeveld. et al. 1990). Calcium is the basic mineral component of the skeleton and plays major roles in neurologic

transmission, muscle contraction, and blood coagulation, in addition to being a ubiquitous intracellular signal. Calcium is mainly absorbed in the duodenum. Calcium absorption from GI tract is regulated by vitamin D and parathyroid hormones. The serum level of calcium (Ca) is closely regulated with normal total calcium of 9-10.5 mg/dL (D. Fraser, G. Jones, S.W. Kooh and I. Raddle, 1994, M.J. Berridge, M.D. Bootman, H. L. Roderick. 2003, W.C Robertson and R.W. Marshakk, 1981. Magnesium is an intracellular cation. It is essential for enzyme activity, for the synthesis of nucleic acids and proteins, and has an important physiological role in the neuromuscular and cardiovascular systems. Total body magnesium is approximately 1000 mmols, of which 60% is in bone, 20% in skeletal muscle, and less than 1% in the extracellular fluid. In the circulation, 65% of serum magnesium is free (ionised), about 20% is protein bound, and the rest is complexed with various anions (eg: phosphate and citrate). The body magnesium balance is regulated by intestinal absorption (predominantly in the ileum and colon), and renal reabsorption (65-75% by the thick ascending loop of Henle, 15-20% in the proximal tubules). The most commonly used method for assessing magnesium status is serum magnesium concentration (H. Classen, 1984; R. Elin, S. Al-Ghamdi, E. Cameron, R. Sutton, 1994). Of the phosphorus in the body, 80% to 85% is found in the skeleton. In the extracellular fluid, including in serum, phosphorous is present mostly in the inorganic form. In serum, more than 85% of phosphorus is present as the free ion and less than 15% is protein-bound. Phosphorus also is an important component of phospholipids in cell membranes. The physiologic concentration of serum phosphorus (phosphate) in normal adults ranges from 2,5 to 4,5 mg/dL (0.80–1.44 mmol/L). Normal values range from 2,4 - 4,1 mg/dl (B. Kestenbaum, J. Sampson, K. Rudser, et al., 2005; G. Block, T. Hulbert-Shearon, N. Levin, et al., 1998; S. Silverberg, E. Shane, T. Clemens, et al., 1986).

This study was carried out in order to compare the differences of laboratory parameters related to bone metabolism such as alkaline phosphatase (ALP), serum calcium (Ca), magnesium (Mg) and phosphorus (P), in various sport branches.

Material and Methods

Serum alkaline phosphatase, calcium and phosphorus, and magnesium levels were measured in 23 skiers, 21 runners, 24 wrestlers, 20 handball, 21 soccers and 30 sedentary living healthy individual.

In the skiers (n=23), 5 subjects were females and 18 male (mean age: 22,3 ± 9,4, range: 19 – 25 years). In the runners (n=21), 4 subjects were females and 17 male (mean age: 25,1 ± 8,4, range: 18 – 26 years). In the wrestlers (n=24), 4 subjects were females and 20 male (mean age: 23,7± 9,1, range: 17 – 26 years). In the handball (n=20), 3 subjects were females and 17 male (mean age: 21,9 ± 7,4, range: 16 – 27 years). In the soccers (n=21), 5subjects were females and 16 male (mean age: 21.9 ± 8.9, range: 20–24 years).We also studied 22 healthy volunteers personnel (5 females and 17 males; mean age: 29.1 ± 11.8, range: 21 – 29 years).

The athletes and controls volunteered to participate in the study and gave their informed consent. None of the athletes and controls were under the treatment of whatever drugs. None of the patients were had any other chronic disease. All the controls were sedentary living healthy individual. Subjects were excluded if they had used any drug such as corticosteroid, methotrexate, etc., or had any disease or condition known to affect bone; had taken corticosteroid medications during the previous 6 months, had a history of chronic renal, hepatic, or gastrointestinal disease or traumatic lumbar compression fracture. Exclusion criteria included liver and kidney diseases, renal stones, diabetes, alcoholism, thyroid and parathyroid diseases hematological, lymph proliferative and other malignant diseases and drugs affecting bone mineral density such as anticonvulsants, corticosteroids, disease-modifying anti-rheumatic drugs (DMARDs), hormone replacement therapy (HRT), bisphosphonates, vitamin D, fluoride, calcitonin, calcium or thiazid group diuretics. Fasting blood samples of the study and control subjects were taken from the cubital vein and the parameters were examined by routine laboratory techniques. Serum ALP, Ca, Mg and Phosphorus were determined by using commercial autoanalyser

Data were processed using the SPSS 11,0 package programme. Laboratory results were given as mean ± standard deviation (SD). Differences between groups were analyzed using the Mann-Whitney U test. The Wilcoxon rank test was used to compare paired populations. Statistical significance level was set to 0.05 for all calculations.

Results

The groups were matched according to age and sex. As expected, there were no significant differences according to age or the female-male ratio between the athletes and controls subjects ($p>0.05$).

Serum alkaline phosphatase (ALP), serum calcium (Ca), magnesium (Mg) and phosphorus (P) were determined in the athletes and the healthy control subjects. In all the athletes and controls, routine biochemical parameters including alkaline phosphatase (ALP), serum calcium (Ca), magnesium (Mg) and phosphorus (P) were within normal limits **(Table 1).** The wrestlers had lower levels of calcium compared to control subjects **($p<0,05$).** The runners and handball had higher levels of phosphatase compared to control subjects **($P<0,05$).** Other parameters had no significant difference between athletes and controls (Table 2).

Discussion

Serum alkaline phosphatase is a mixture of isoenzymes contributed primarily by bone, liver, and intestine. Most data indicate that the elevation of serum ALP occurs because of the accelerated de novo synthesis of the enzyme and subsequent regurgitation into the serum (J. Reichling, M. Kaplan, 1967). Because of these contributions, serum alkaline phosphatase determination has been used to help distinguish between normal and disease states of these organs (G. Szasz, T. Hausamen, R. Helger, W. Rick and W. Gross, 1967). Age-and sex-related effects relative to serum alkaline phosphatase have been demonstrated by several investigators (SJ. Silverberg, 1997). There are non-significant differences in serum ALP concentrations between with all the different athletes and the control group. Because athlete groups aren't different from control group in respect of age and gender. However no body, who participated in this study including control group, has any disease which affects level of serum ALP. Calcium metabolism is complex, and other factors such as impaired liver and kidney function, poor nutritional status, and medications may act as confounding variables lowering calcium[17.] The present investigation reveals the net effect of these sport branches except for wrestlers group on serum calcium levels. In our study, serum levels of calcium were significantly lower only in the wrestlers group than the control group. The differences of the level or amount of daily diet may lead to low calcium level in wrestlers. Magnesium is an essential ion for many enzymatic reactions, especially those using high energy phosphate bounds (E. Ford, 1999). The low serum magnesium levels are associated with coronary heart disease (J. Ma, A. Folson, S. Melnick, J. Eckfeldt, A. Sharrett, A. Nabusi, R, Hutchinson, P. Metcalf, 1995), atherosclerosis- (PA Marken, CW.Weart, DS.Carson, JG. Gums, MF. Lopes-Virella, 1989) dyslipidemia (PA. Deuster and A. Singh, 1993.) As a metabolic cofactor, Mg is important in energy metabolism and glucose homeostasis[18.] The findings on serum magnesium concentration in these groups of patients were completely normal. In our study, there was not a significant rise in serum magnesium levels between in the athletes groups compared with the controls. The results are in total agreement with some previously published reports. Accumulating evidence has shown a direct relationship between magnesium and exercise performance. Some studies have reported that serum or plasma magnesium concentration was decreased after exercise(M. Laires and F. Alves, 1991; M. Levi, RE. Cronin, JP. Knochel,1992). No abnormal serum magnesium level has been found in any group including control group may be because they did not get exercise before the survey. The physiologic concentration of serum phosphorus (phosphate) in normal adults ranges from 2,5 to 4,5 mg/dL (0.80–1.44 mmol/L). A diurnal variation occurs in serum phosphorus of 0,6 to 1,0 mg/dL, the lowest concentration occurring between 8 AM and 11 AM. A seasonal variation also occurs; the highest serum phosphorus concentration is in the summer and the lowest in the winter. Major determinants of serum phosphorus concentration are dietary intake and gastrointestinal absorption of phosphorus, urinary excretion of phosphorus, and shifts between the intracellular and extracellular spaces. Abnormalities in any of these steps can result either in hypophosphatemia or hyperphosphatemia(K. Hruska, A. Gupta, 1998; JP. Knochel , R. Agarwal ,1996). In our study, there was also an alteration in serum phosphorus concentration in the groups with runners and handball. Potassium, the level of diurnal, has been measured as normal especially in healthy sedentary group. This can be explained by the fact that it was winter afternoon when the blood samples were received.

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PREVENTION OF MUSCULO-SKELETAL TRAUMAS IN COMPETITIVE SPORTSMEN
(Aspects regarding trauma incidence in volleyball and basketball teams)

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ABSTRACT

Traumas occur frequently in the competitive sportsman's life.

The causes and the mechanisms of musculo-skeletal traumas vary with every sport.

Objectives

1. To identify the factors that favour/determine traumas caused by overstress.
2. To determine the trauma incidence in the studied sportsmen.
3. To develop and implement prophylactic training protocols.
4. To detect musculo-skeletal traumas early, using modern investigation methods: musculo-skeletal ultrasound scan, MRI, CT.
5. To determine the main musculo-skeletal traumas occurring in sports practising.
6. The functional rehabilitation of the injured segment so that the sportsman can resume his/her competitive activity at best possible parameters and without the risk of relapse.
7. To create (clinical, imagistic and prevention) algorithms to monitor the sportsmen.
8. To keep trauma-affected sportsmen under a three-year monitorisation period and to draw the conclusions.

Material and methods: the study batch included 107 sportsmen of the volley, basketball, handball and football teams, league A1 and A2, from Timisoara and Lugoj, in the competition period 2006 -2009.

Research methods: bibliographic study, observation, inquiry, questionnaire, the statistical-mathematical method, the graphic method, radio-imagery methods (CT, MRI) of investigating sportsmen with musculo-skeletal traumas.

Treatment and prevention:

The rehabilitation therapy is complex and intensive. It should be correlated with the sportsman's training level, his/her performance level at the time the trauma occurred, and the functional level the sportsman should reach in order to resume his competitive activity.

Relaxation, cryotherapy, anti-inflammatory and myorelaxing drugs, compressions, adjuvants are the first means to apply as soon as trauma has occurred.

Means of rehabilitation: massage, kinetotherapy, electrotherapy, thermotherapy, balneotherapy.

This paper brings forward several complex physical exercises focusing on groups of muscles and joints involved in specific types of motility required by different sports. The exercises were chosen so as to increase articular mobility and improve muscle and ligament flexibility.

In theory, all traumas can be prevented through training that is initiated and performed correctly, proper physical and psychical training and preventive imagistic monitorisation.

Key words: sportsmen, musculo-skeletal traumas, prevention, radio-imagery diagnosis, rehabilitation

Introduction

Injuries are a common fact in the competitive sportsman's life. They are caused by too short warm-up periods, faulty training, improper equipment, specific trauma, aggression on the court etc. The detection and treatment of the preclinical forms, the therapeutic conduct and the sportsman's rehabilitation are only a few of the directions to pursue in finding viable solutions to sport performance related problems.

Prevention includes specific exercises as part of the training programme. Such exercises are meant to increase articular and periarticular structure flexibility, ligament resistance and muscular elasticity. They provide biomechanical joint consolidation, stability and maximum use of joint movement limit.

In addition to the above, massage and self-massage may be applied corresponding to the effort, the training period, and the protection of the trauma-exposed articular areas through taping and stretching (primary prevention) and proper treatment and rehabilitation (secondary prevention).

Objectives

1. To identify the factors that favour/determine traumas caused by overstress.
2. To develop and implement prophylactic training protocols.
3. To determine the trauma incidence in the studied sportsmen.
4. To detect musculo-skeletal traumas early, using modern investigation methods: musculo-skeletal ultrasound scan, MRI, CT.
5. To determine the main musculo-skeletal traumas varying with every sport, longevity in sport practising, the anatomical and clinical

condition, the uni/bilateral location of the affection, the number of days of partial/total rest required by the diagnosed clinical condition..

6. To establish clinical, imagistic and prevention algorithms to monitor the sportsmen.
7. To keep trauma-affected sportsmen under a three-year monitoring period and to draw conclusions.

Working hypotheses

This paper starts from the premise that high trauma incidence among the studied competitive sportsmen is caused by controllable factors. A distinction is made between extrinsic factors that are unrelated to the sportsman (improper state of the field, training errors, risk of sport-specific traumas, inadequate equipment) and intrinsic factors (the sportsman's anatomic and biomechanic characteristics, previous traumas treated improperly, Ca and Mg deficits, etc.). Primary and secondary prevention will lead to a decrease in the incidence of trauma.

Material and methods

The study batch included 107 sportsmen of the volleyball, basketball, handball and football teams in Timisoara and Lugoj, league A1 and A2, in the 2006-2009 competition period.

Given the necessity of cases that should benefit from an investigation protocol including CT, MRI, treatment and rehabilitation, we cooperated with the Radiology and Medical Imagistics Clinic of the Victor Babes University of Medicine and Pharmacy Timisoara, the Sanotim CT scan centre and a kinetic therapy and medical rehabilitation centre.

The sportsmen were monitored both while training and during games, with the help of medical sportsmen and kinetic therapy experts, and the medical staff representative for training camps and away games. The incidence of trauma was reported for all training stages.

Research methods: bibliographic study, observation, inquiry, questionnaire, statistical-mathematical methods, graphic methods and radio-imagery methods (CT, MRI) for investigating sportsmen with musculo-skeletal traumas.

Registered data, results and interpretations

The distribution of the study subjects on sports

No	Sport	Teams	Number of sportsmen	Total of subjects with traumas	%
1.	Volleyball	Lugoj League A 1 W	14	14	100 %
2.	Volleyball	Poli Tm League A 2 W	11	9	82%
3.	Volleyball	University of the West League A2 M	14	13	92.9%
4.	Basketball	Elba Timisoara League 1 M	12	12	100%
5.	Basketball	University of the West League A2 M	12	12	100%
6.	Basketball	University of Medicine and Pharmacy Timisoara M	12	11	90.91%
7.	Basketball	University of Medicine and Pharmacy Timisoara W	12	11	90.91%
8.	Handball	University of the West League A2	14	12	86%
9.	Football	C.F.R. Timisoara	18	16	89%

Injury prevention involves the identification of the first signs that can be noticed and analysed by the coach, the doctor and the sportsman.

Causes of injuries:

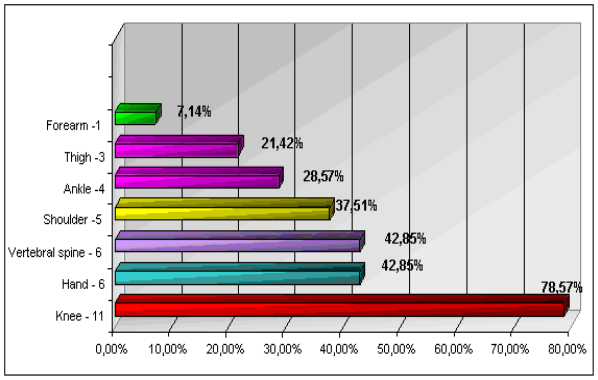
- lack of energy or torpidity that does not disappear after the first minutes of warming-up, indicating an overstress of the muscle-bone system structures
- the thought of giving-up and unexplainable poor performance
- chronic fatigue
- a 10 beats/minute increase of the heart rate
- lack of appetite, irascibility and/or depression, indicating overtraining
- too short
- wrong training methods
- movements not reaching the maximum movement amplitude
- tendon or joint overtraining
- articular imbalances
- weight gain
- insufficient rest
- lack of concentration
- tendon and ligament overstretching
- ignoring acute and localised pain

Results - Volleyball - Women - League A1

No	Name & surname Initials	Year of birth	First year of competitive sport practising	Player category	Player specialisation	Height (cm)	Weight (kg)
1.	B.S.	1988	1998	League A1	spiker	180	65
2.	C.L.	1987	2002	League A1	spiker	188	74
3.	S.A.	1989	1998	League A1	spiker	174	63
4.	B.D.	1988	1998	League A1	setter	172	63
5.	C.L.	1988	1998	League A1	spiker	177	65
6.	M.C.B.	1967	1980	League A1	setter	173	56
7.	M.I.	1989	2000	League A1	spiker	183	70
8.	H.A.M.	1988	1998	League A1	spiker	180	76
9.	L.D.	1986	1995	League A1	spiker	175	67
10.	S.M.	1988	1996	League A1	libero	167	65
11.	F.A.M.	1984	1995	League A1	spiker	183	68
12.	M.D.	1983	1994	League A1	libero	169	64
13.	C.G.	1985	1993	League A1	spiker	181	63
14.	C.A.	1989	1999	League A1	libero	169	59

Distribution of traumas based on the affected area Volleyball (a team of 14 sportswomen)

No	Area affected by musculo-skeletal trauma	Sportswomen with traumas	TYPE OF TRAUMA
1.	Knee	11 *(78.57%)*	Meniscal tears, fissures, sprains, tendinites, collateral and cruciate ligament injuries
2.	Ankle	4 *(28.57%)*	Sprains, fractures
3.	Shoulder	5 *(35.71%)*	Tendinites, rotator cuff tear
4.	Spine	6 *(42.85%)*	Cervical spondylosis, lordosis, scoliosis
5.	Hand	6 *(42.85%)*	Sprains, strains, fractures
6.	Thigh	3 *(21.42%)*	Muscle ruptures
7.	Forearm	1 *(7.14%)*	Fracture



Result interpretation: volleyball

The most frequent traumas within the volleyball team were knee injuries: 11 cases (78.57% of the players). Among these, meniscal injuries were the most common (degeneration, fissure, tear). One sportswoman underwent meniscal tear surgery.

The musculo-skeletal trauma distribution within the volleyball team was as follows:

≥ 3 traumas -10 players

< 3 traumas - 4 players.

A number of 46 musculo-skeletal traumas were registered in the CSM Lugoj volleyball team of League A1 in September 2006 - April 2009. Most injuries were caused by falls and ball hits.

The injuries are associated with blocking and attacking, as both involve jumping. Both the upper and the lower part of the locomotor system are permanently strained. Injuries of the superior part account for over 50% of the traumas. Overstress injuries account for 80% of the traumas, while 20% are accidental lesions. Example: in the volleyball team, C.L. suffered from ankle sprain relapse and S.A. had right knee sprain and cruciate ligament injury.

The pathology in the volleyball team included the following affected regions:

- ✓ shoulder joint complex (impingement syndrome, rotator cuff pathology, acute or chronic instability)
- ✓ back (effort-related lumbar pain and paravertebral muscle contraction)
- ✓ knee joint (sprains, strains, collateral ligament injuries and meniscal tears
- ✓ tibio-tarsal joint (sprains by inversion or eversion, strains, acute or chronic instability);
- ✓ hand phalangeal sprains and overstress traumas
- ✓ frequent tendinitis, tenosynovitis, enthesitis of Achilles tendon, kneecap tendon, shoulder, muscle ruptures and myositis.

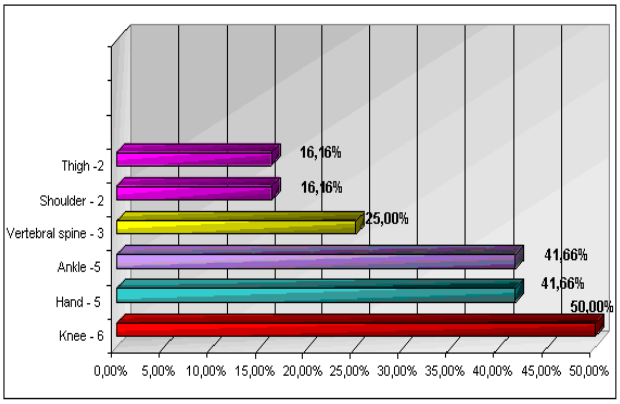
Other injuries in the volleyball team were contusions (which occur most frequently, but most of them are minor) and effort-related lumbar pains that cause pain and paravertebral muscle contraction.

ELBA Timisoara Municipal Basket Club

No	Name & surname	Age (years)	Height (cm)	Weight (kg)	Player specialisation	Age of debut
1.	S.B.	21	196	92.5	Small forward	13
2.	T.D.	21	181.5	81	Point guard	12
3.	D.R.	28	185	82	Point guard	13
4.	V.U.	25	189	77	Shooting guard	9
5.	P.M.	24	203	102	Small forward	10
6.	V.N.	22	194	86	Shooting guard	9
7.	M.N.	27	196	94	Small forward	7
8.	P.D.	29	208	114	Centre	15
9.	G.B.	28	211	112	Centre	16
10.	C.P.	29	202	91	Small forward	12
11.	T.A.	25	202	112	Centre	14
12.	P.F.	21	194	76	Shooting guard	10

Basketball (a team of 12 sportsmen)

No	Area affected by musculo-skeletal trauma	Sportsmen with traumas	TYPE OF TRAUMA
1.	Knee	6 (50%)	Ligament injuries, anterior cruciate ligament ruptures, bone edema
2.	Ankle	5 (41.66%)	Sprains
3.	Shoulder	2 (16.66%)	Tendinitis
4.	Spine	3 (25%)	Lumbar sciatica
5.	Hand	5 (41.66%)	Strains, tendinitis, fractures, sprains
6.	Thigh	2 (16.66%	Muscle ruptures



Result interpretation: basketball

In the basketball team, knee injuries were also the most frequent: 6 cases (50% of the players). Of these, the most common were ligament injuries (collateral and cruciate ligament affections).

The musculo-skeletal trauma distribution among the twelve basketball players was the following:

≥ 3 traumas – 6 players

< 3 traumas – 6 players.

A number of 40 musculo-skeletal traumas were registered in the Elba Timisoara basketball team

in September 2006 - April 2009. Most lesions were caused by direct contact with the opponent, unreasonable violence and aggression on the basketball court and ball contact and hits.

The pathological aspects concern mainly the ligaments and the joint system.

The most common injuries are sprains of the ankle (tibio-tarsal sprains), knee and phalange, overstress traumas, tendinitis, tenosynovitis, enthesitis (Achilles and kneecap tendons, elbow and shoulder), muscle ruptures and myositis.

Other injuries were contusions (which occur frequently, though most of them are minor) and effort-related lumbar pains that cause pain and paravertebral muscle contraction.

The results of our study have revealed a larger number of traumas in the players than the literature of the field. The high trauma incidence is caused by an association of controllable factors:

- insufficient effort capacity
- hypocalcemia
- kyphosis, lordosis
- improperly treated previous traumas
- errors in the training methods
- inadequate basketball court

Given the importance of primary and secondary prevention, this paper brings forward a coherent programme of complex exercises focusing on the groups of muscles and joints involved in specific types of motility required by different sports.

The exercises were chosen so as to increase muscular balance, articular mobility and improve muscle and ligament flexibility (major factors in trauma prevention).

A complex of exercises

❖ **Warming-up** - 10 minutes' running (cross-over steps, backward running)

❖ **Stretching** (for the cervical region, the body, the arm and forearm muscles, the shoulder muscles, the inferior limb muscles and joints; they can be done individually or with a partner).

1. Bend your head forward, backward, to the right, to the left. Turn your head to the right, to the left (3 x 7-10 seconds, 2-4 seconds break).
2. Stand with your legs apart and stretch your right arm to the left. Place your right arm across your body at shoulder height and gently pull it toward your body with your left hand, holding your left forearm at the right elbow level. (3 x 7-10 seconds, 4 seconds break). Repeat for the left arm.
3. Stand with your legs apart and hands behind your back. Clasp your right wrist with your left hand and pull it downwards while bending your head to the left (2 x 10-15 seconds, 4 seconds break). Switch arms and repeat.
4. Stand with your legs apart and raise your right arm. Clasp your hands at shoulder blade level. (2 x 10-15 seconds, 2-4 seconds break). Then raise your left arm and do the same.
5. Stand with your legs apart; bend your trunk with arms raised and palms on the stall bar. Keep your back straight. Then bend your trunk with hands on your hips. (2 x 15 seconds, 4 seconds break).
6. Stand with your legs apart, bend your trunk and touch the ground with your palms. Keep your back straight (2 x 15 seconds, 2-4 seconds break).
7. Stand with your legs apart. Bend your trunk to the left, raise your right arm, keep your left arm relaxed on the ground (2 x 15-25 seconds, 2-4 seconds break). Then bend your trunk to the right.
8. Sit down, bend your left knee and cross it over your right knee, with your sole on the ground. Turn your trunk to the left while touching your left knee with your right elbow and leaning your left arm behind on the ground (2 x 15-25 sec, p 2-4 sec). Then bend your right knee and repeat.
9. Lie down on your abdomen and raise your arms. Do trunk extensions (3 x 10-15 seconds, 2-4 seconds break).
10. Forward lunges alternating right and left foot (3 x 15-25 seconds, 2-4 seconds break).
11. Stand and take a step to the right, flexing your right leg and stretching the left one. (3 x 15-25 seconds, p 2-4 seconds). Switch sides and repeat.
12. Lunge forward, stretch your leg behind, and turn your trunk to the right with your right hand on your right knee and your left hand on the ground. Switch legs and repeat.

❖ **Non-specific fitness exercises**:

- Running and jumping (pawing drill, high knees drill, heel kicks, skipping), 2 x 30 m, 30 seconds break.
- Standing with your legs apart, jump with your hands over your head, bend your trunk laterally, and rotate your trunk, 2 x 8 times, 10-15 seconds break.
- Sit-up jumps for lower limb extension and contracting abdominal muscles, 2 x 8 times, 10-15 seconds break.

❖ **Warm-up exercises typical of every sport following general warm-up.** They warm-up those parts of the body that are used mostly while practising a certain sport.

- Volleyball: shoulder rolls (headers), passing, receiving, attacking, blocking, and serving.
- Basketball: dribbling, passing, shooting etc

❖ **Weight lifting and resistance exercises.** This programme takes place weekly and involves isotonic and isometric exercises.

❖ **Taping and strapping**

The following **rules** will be obeyed**:**

- exercise to be repeated 3-4 times only
- slow speed
- for weight lifting, 80% maximum lifting load.

OBSERVATIONS

The stretching exercises became part of the training sessions to prepare the body for effort. They have a positive effect on the amplitude of the movements (make movements easier) and the muscle groups that are involved in common warm-up (intervertebral, intercostal, scapulo-humeral and abdominal oblique muscles).

These exercises have both an immediate effect and a cumulative effect in time, improving articular mobility and muscle and ligament elasticity – major factors in trauma prevention.

Conclusions and suggestions

Sport games are a chain of individual and collective movements involving high speed, force and precision. Body stress is variable: short periods of maximum stress followed by reduced effort, using a metabolic model of aerobic and anaerobic exercises.

The locomotor system (the knees, the ankles, the upper limbs, the scapulo-humeral and interphalangeal joints, the spine, especially the lumbar region) is subjected to overstress.

In addition to specific training, basketball and volleyball players need strong, mobile joints and well-developed muscles that allow a high level of quality movements both for performance and injury prevention.

The final conclusion will be drawn by monitoring the trauma incidence of the study teams after the suggested programmes have been applied.

The results of our study underline the importance of both primary prevention that eliminates factors causing injuries and secondary prevention, in the case of injury relapse (elastic contention, proper and total trauma rehabilitation and gradual training resume).

Suggestions

Given the importance of primary and secondary prevention, this paper brings forward a coherent programme of complex physical exercises focusing on the groups of muscles and joints involved in specific types of motility required by different sports. The exercises were chosen so as to increase muscular balance, articular mobility and improve muscle and ligament flexibility (major factors in trauma prevention).

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CHANGE OF BLOOD SE LEVELS AFTER HIGH LEVEL AEROBIC EXERCISE

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ABSTRACT

Aim: This study was carried out to determine the effect of high level aerobic exercise upon the anti oxidant Se levels. **Method:** the study was participated by 16 healthy male university students with an average age of 20.09 ± 1.22 years. The participants were given a selenium free diet for a week before the start of the study.

Results and discussions: There were 5 cc venous blood samples taken from the participants before and after they were subjected to 20 m exhaustive shuttle runs after a resting period of 15 minutes. The selenium determinations were carried out with ICP. The results showed that the selenium levels showed statistically significant decrease between pre and post exercise values ($p<0.01$). The maximal aerobic exercise was observed to decrease the Se levels in blood .

Key words: blood, level, selenium.

Introduction

Selenium is an essential micronutrient for the human body when taken in appropriate doses . Selenium attaches the proteins to form anti oxidant selenoproteins . During physical activity, the oxidative stress due to excessive oxygen consumption is compensated by higher levels of free radical scavengers and by an increase in the activities of antioxidant enzymes such as glutathione peroxidase enzyme containing Se (PM. Clarkson, HS, Thompson, 2000, R.R. Jenkins, 1993).In association with vitamin E and glutathione, Se is anticarcinogenic and delays aging and degenerative neurological diseases. It protects the muscles, heart and arteries and helps combat inflammatory and allergic diseases (C. Mates, JM. Perez-Gomez, M.Blanca, 2000, R.J.Shephard, P.N.Shek, 1998). Few results are available concerning Se concentration during or following physical activity, and the levels of glutathione peroxidase reported in athletes are divergent (R.J.Maughan, 1999, GD.Brites, PA.Avelson, MG. Christiansen, et al,1999). Endurance training may induce heterogeneous effects on oxidative and antioxidant adaptation independently of Se supplementation (GD.Brites, PA.Avelson, MG. Christiansen et al,1999). The daily Se need is estimated to be 55 micrograms [http://www.food-info.] However, athletes are generally not affected by Se deficiencies (R.J.Maughan, 1999).It is known that high level aerobic exercises trigger oxidative stress and amount of Se needed. This study was carried out to determine this effect.

Material And The Method

Selection of the participants

The study was carried out on 16 male participants studying in various faculties of Ankara Bilkent University who did regular sports at fitness level. All the participants were volunteered to participate the study and they were briefed about the importance of the study and rules they had to obey. The participants were given a selenium free diet for a week.

The physical and physiological test

Age, height and weight of the participants

The ages of the participants were recorded in years, and the heights were determined with bare feet in meters. The weights were measured with bare feet and wearing a short only in kg with an accuracy of 0.01 kg. All the measurements were taken one day prior to the start of the test

Collection of the blood samples

After the determination of the anthropometric features of the participants there were 5cc of blood was collected from each participant at rest. The participants were subjected to 20 m shuttle runs to test their aerobic limits after 30 minutes of rest . There were 5 cc bloods collected after these runs.

20 Meter shuttle runs and the determination of max VO2

The maxVO2 values of the participants which show the cardiovascular aerobic capacity were determined in ml.g/min with shuttle runs. The results were evaluated from the related tables. The hearth beat rates of the participants were taken after the runs in order to determine their exhaustion levels.

Statistical analyses of the data

The analysis of the data obtained was carried out by the use of SPSS 10.0 statistical software. The comparison of the pre and post training measures was made by paired simple t-test.

Experimental method

ICP-OES Protocol microwave digestion procedure

On the 1 mL blood samples was added 2.0 mL HNO_3 and the samples were digested in Berghof / Microwave Digestion system MWS-3 microwave apparatus. The microwave were kept at 160 °C for five minutes and at 190 °C, 100 °C and 80 °C for ten minutes each. The totally digested samples were diluted to 10 mL with the addition of deionized water 18.3 mohm cm^{-1}.

Selenium analysis with the use of ICP-OES apparatus

Se analyses were carried out in the laboratories of Science Faculty of Gazi University There were 100,250,500 and 750 ug/L standard Se

solutions were prepared from its 1000 ppm standard solutions and a calibration curve was plotted . Then selenium analyses of each sample was performed by making at least five readings. The results are tabulated in Table 2 Selenium was converted to its hydride before the analyses. 1 mL of 10% HCL was added onto 1 mL of digested blood samples and kept at 90 °C for 20 minutes. The samples were analyzed with the use of Perkin Elmer Optima 5300 DV model ICP-OES after they were cooled down.

Results

Table 1: Physical parameters of the participants.

Parameter	**Mean values** ($\overline{X}$)	**SD**	**Minimal Maximal**
Age (year)	22.69	1.92	20.00–26.00
Height (cm)	181.50	4.00	174.00- 190.00
Body weight (kg)	80.69	2.89	76.00 – 87.00
MaxVO2 (ml. kg/dk)	50.01	3.07	42.4 – 53.7

Table 2: The statistical analysis revealed that there is a significant difference between the pre and post- training Se values of the participants $p< 0.01$

Element	**N**	**Pre training mean value** ($\overline{X}_1$)	**SD**	**Post training mean value** ($\overline{X}_2$)	**SD**	$\overline{X}_1 - \overline{X}_2$	**p**
Selenium (µg / L)	16	339.71	86.41	274.95	41.22	64.76	.000

Discussion

Although the results in literature are contradictory it was clearly visible that there was a important decrease in the blood selenium levels of the participants after the test. This was attributed the increased oxidative stress induced upon them as a result of aerobic exercise. It can be concluded that the athletes should be supplemented with appropriate doses of selenium before aerobic exercises

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❖ PHYSICAL EDUCATION AND SPORT

VIEWS OF PHYSICAL EDUCATION TEACHERS ABOUT DIMENSION OF THE MATERIAL AND MEASUREMENT EVALUATION OF THE NEW EDUCATIONAL PROGRAM OF PHYSICAL EDUCATION COURSE OF THE PRIMARY SCHOOL

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ABSTRACT

The education in every country admits to educate the human force in the qualification in order to operate the systems which are vital for the society as a task. In order that the education completes this task, the educational institutions' functions, operations and educational programs are arranged so that they meet the needs of individuals and social requirements. The physical education is the integral part of the common education. Both educations, which there is a parallelism between their objectives, bear a qualification which is complement to each other. It has been discussed to arrange the educational programs according to the today's needs in our country, and the primary and secondary educational programs have been changed based on the developments in the world and Turkey. The views of the physical education teachers, who will apply this program, about the new program are very important. Therefore, whether the views of the physical education teachers about the dimension of the material and measurement evaluation of the new educational program show difference based on the sexes and seniorities of the teachers is a subject which must be examined.

Methods

Survey included total 110 physical education teachers (65 males, 45 females). A scale in the Likert type in five has been prepared in order to determine the views of the physical education teachers about the dimension of material and measurement evaluation of the new educational program of the physical education course of primary school. In the scale, 12 cases have been presented to the teachers about the material and measurement evaluation dimension of the program, and it has been requested that the teachers have stated their views about those cases. It has been found that the scores of the permanent variables did not show meaningful difference between the groups, and two groups have been tested with t-test, three groups with single direction variance analysis, and in order to determine the difference between the groups, Scheffe-Dunnett C Multiple Comparison Test has been used. The significance level in the survey has been accepted as 0.5.

Results

As a result, the male teachers think that they experience lesser problems than the female teachers in the measurement evaluation dimension of the primary school's new physical education course program. The teachers, who have the 11–15 years of seniority, find the measurement evaluation dimension more positive than the teachers who have the seniority between 1–5 years and 6–10 years, and the views of the teachers about the material dimension of the primary school's new physical education course program did not change much based on their seniorities. And it has been determined that the male teachers have experienced lesser problems than the female teachers in the measurement evaluation dimension of the primary school's new physical education course program.

Discussion

According to the study by Yaşar et al. (2005), the teachers need the education about the measurement evaluation dimension of the program. According to the study by Gözütok et al. (2005), it has been stated that the teachers found themselves more unqualified about the measurement evaluation subject than about other dimensions of the program.

According to the study by Yaşar et al. (2005), it has been found that the teachers needed the education about the educational technologies of the program and material development dimension, and according to the study by Özşaker and Orhun (2005), the state schools were insufficient in the aspect of area, facility, tools sufficiency in the schools at 45,8% and the views of the teachers did not show the much difference based on their seniorities.

Key words: primary school, physical education, teachers.

Introduction

The education in every country admits to educate the human force in the qualification in order to operate the systems which are vital for the society as a task. In order that the education completes this task, the educational institutions' functions, operations and educational programs are arranged so that they meet the needs of individuals and social requirements. The physical education is the integral part of the common education. Both educations, which there is a parallelism between their objectives, bear a qualification which is complement to each other. It has been discussed to arrange the educational programs according to the today's needs in our country, and the primary and secondary educational programs have been changed based on the developments in the world and Turkey. The views of the physical education teachers, who will apply this program, about the new program are very important. Therefore, whether the views of the physical education teachers about the dimension of the material and measurement evaluation of the new educational program show difference based on the sexes and seniorities of the teachers is a subject which must be examined.

Material and Method

110(65 male,45 female)physical education teachers participated the research.A scale of five Likert type wasprepared to determine the Physical Education teachers views on the new teaching programme of material and testing/measurement&evaluation in primary schools Physical Education lessons.In the scale, 12 situations at the material and testing/measurement&evaluation level were given and the teachers were asked to give theirviews about these situations.Whether the results of the continuous variables have a meaningful difference between the groups was tested by T test for two groups,one-way variance analysis for three groups.To find the difference between the groups,Scheffe-Dunnet C Multiple Comparison Test was used.The level of significance was regarded as .05.The research environment consists of physical education teachers teaching at 89 official primary schools in Keçiören,the district of Ankara in 2007-2008 Education year.This research is abaut the programme which has been in use for two years. To determine the Physical Education teachers'views on the new Primary Schools Physical education Teaching Programme,a scale has been developed.The scaleis shown in **Table 1**.

Table 1

	Expressions	I don't agree at all		I don't agree		I am not sure		I agree		I absolutely agree	
		f	%	f	%	f	%	f	%	f	%
Material	1. I think that the technological hardware is enough to carry out the new education program of the physical education course for primary schools.	39	35.5	52	47.3	7	6.4	12	10.9		
	2. I think I can benefit from technological tools adequately.	19	17.3	39	35.5	9	8.2	41	37.3	2	1.8
	3. I think that my students can benefit from technological tools adequately.	25	22.7	52	47.3	13	11.8	20	18.2		
	4. I think the sources are enough for the preparation of the needed materialis	18	16.4	41	37.3	29	26.4	19	17.3	3	2.7
	5. I have financial problems when it comes to making copies of the measurement and evaluation forms.	4	3.6	20	18.2	17	15.5	54	49.1	15	13.6

Measuremenet and Evaluation	6. I think the existence of many measurements and evaluations creates a problem.	11	10.0	55	50.0	31	28.2	8	7.3	5	4.5
	7. I'm able to use observation forms, performance tests and scales adequately.	6	5.5	28	25.5	48	43.6	28	25.5		
	8. I have problems in pursuing the classifying of the students product files.	12	10.9	56	50.9	19	17.3	21	19.1	2	1.8
	9. I have problems reflecting the measurement results that are gotten from different measurement tools to grades.	6	5.5	52	47.3	26	23.6	24	21.8	2	1.8
	10. I think that the measurement and evaluation system is complex.	17	15.5	36	32.7	14	12.7	37	33.6	6	5.5
	11. I have problems in performance exercises.	6	5.5	64	58.2	15	13.6	22	20.0	3	2.7
	12. I think that it is a problem that performance exercises are done by families..	31	28.2	59	53.6	14	12.7	6	5.5		

The material dimension of this scale has been assessed as the first sub problem and the measurement and evaluation dimension has been assessed as the second sub problem.

1. Findings about the first sub problem

The first sub problem is "the views of the physical education teachers about the material dimension of the physical education course of the new education program of primary schools."

The material dimension of the study was expressed as follows:

a. Does it show differences according to the gender of the teachers?
b. Does it show differences according to the seniorities of the teachers?

a. The question; **"**does the material dimension of the physical education course of the new education program of primary schools show differences according to the gender of the teachers?" was analyzed with an independent t test. According to the test the following findings were gotten and shown in table 2:

Table 2
The differences of the views of teachers about the material dimension of the program according to their genders

	Sex	N	$\overline{X}$	S	t	P
Material	Male	65	13,17	3,54	,873	,385
	Female	45	12,58	3,43		

In table 2 views of teachers about the material dimension don't show a statistically meaningful difference according to their genders.

b. The question; **"**does the material dimension of the physical education course of the new education program of primary schools show differences according to the seniority of the teachers?" was analyzed with statistical processes and a one-way variance analysis (Anova). According to the test the following findings were gotten and shown in table 3:

Table 3
The differences of the views of teachers about the material dimension of the program according to their seniority

	The source of the variance	**KT**	**sd**	**KO**	**f**	**p**
Material	In groups	86.533	4	21.633	1.831	.128
	Inside groups	1240.885	105	11.818		
	Total	1327.418	109			

	seniority	N	$\overline{X}$	S
Material	**1.** 1-5 Years	11	11.64	2.97
	2. 6-10 Years	58	12.53	3.58
	3.11-15 Years	18	13.55	1.98
	4. 16-20 Years	7	15.57	5.09
	5. 21 and more	16	13.37	3.65
	Total	110	12.93	3.49

p<.05

In table 3 views of teachers about the material dimension don't show a statistically meaningful difference according to their seniority.

2. Findings about the second sub problem

The second sub problem is "the views of the physical education teachers about the measurement and evaluation dimension of the physical education course of the new education program of primary schools."

The tasting/measurement and evaluation dimension of the study has been expressed as follows:

a. Does it show differences according to the gender of the teachers?
b. Does it show differences according to the seniorities of the teachers?

a. The question; **"**does the testing/measurement and evaluation dimension of the physical education course of the new education program of primary schools show differences according to the gender of the teachers?" was analyzed with an independent t test. According to the test the following findings were gotten and shown in table 4:

Table 4

The differences of the views of teachers about the material
dimension of the program according to their genders

	Sex	N	$\overline{X}$	S	t	p
Measurement and Evalution	Male	65	19,48	3,43	5,657	,000
	Female	45	15,51	3,87		

In table 4 there is a statistically meaningful difference in benefit of the male teachers in the measurement and evaluation dimension.

b. The question which is under the scope of the second sub problem; **"**does the measurement and evaluation dimension of the physical education course of the new education program of primary schools show differences according to the seniority of the teachers?" was analyzed with statistical processes and a one way variance analysis (Anova). According to the test the following findings were gotten and shown in table 5:

Table 5

The differences of the views of teachers about the dimension of the measurement and evaluation program according to their seniority

	The source of the variance	KT	sd	KO	f	P	Difference*
Measurement and Evalution	In groups	446.550	4	111.638	8.475	.000	1-3
	Inside groups	1383.122	105	13.173			2-3
	Total	1829.673	109				

*__1__=1-5 Years, **2**=6-10 Years, **3**=11-15 Years

	Seniority	N	$\overline{X}$	S
Measurement and Evalution	**1.** 1-5 Years	11	17.09	3.56
	2. 6-10 Years	58	16.33	3.95
	3.11-15 Years	18	21.67	3.23
	4. 16-20 Years	7	20.00	3.83
	5. 21 and more	16	18.68	2.60
	Total	110	17.85	4.09

p<.05

In table 5 views of teachers about the dimension of the measurement and evaluation don't show a statistically meaningful difference according to their seniority.

Results

1.a) The question which is under the scope of the first sub problem; **"**does the material dimension of the physical education course of the new education program of primary schools show differences according to the gender of the teachers?" was analyzed with an independent t test. According to the test the following findings were gotten and shown in table 2:

Table:2, After analyzing the question in a .05 significance level with a t test, it was found that there isn't a meaningful difference between the material dimension and the gender variables (t= ,873; p> .05). If we look at the data that were gotten we see that the arithmetical average of the male teachers is $\overline{x}$ =13,17 and that their standard variance is S=3,54, whereas the arithmetical average of the female teachers is $\overline{x}$ = 12,58 and their standard variance is S=3,43. According to this result it is seen that the average and standard variance distribution values between the male and

female teachers are comparable and despite the fact that the average of the male teachers is higher than the female teachers, the difference between these averages doesn't express statistically a meaningful difference.

b) The question which is under the scope of the first sub problem; **"**does the material dimension of the physical education course of the new education program of primary schools show differences according to the seniority of the teachers?" was analyzed with statistical processes and a one way variance analysis (Anova). Because the values [$f_{(4-105)}$ = 1.831, p>.05] are at the level of .05, so a meaningful difference couldn't be found.

According to this result it can be said that the views of the physical education teachers about the material dimension of the physical education course of the new education program of first schools don't change much according to their gender.

According to the study of Yaşar and his friends (2005) it is stated that the teachers need the following: Firstly they need to be educated about the education technologies and the material development dimension of the program, they definitely need education for efficiency, duty, work and the preperation of experiment documents, information documents and process documents; also for preparation of overhead projector transparents, preperation of slides, preparation of schemes-figures and graphics by hand, preperaion of panels, posters and powerpoint presentations. According to the studies of Gözütok and his friends (2005) it is found that the teachers perceive themselves successful in many subjects, but the observation results showed that the teachers are actually not successful at a specific level they thought they would be. Also the following points were found out: despite the fact that teachers state that they find themselves adequate in the subject of configuration, they didn't respect the views of students; they didn't form a positive and democratic communication atmosphere in the class; they stated that they see themselves adequate in issues like preparing and using materials, forming efficiency and planning the teaching process according to the new program, but they didn't provide opportunities for the students to form meaningful relations between their pre-learning and their new learnings, they also didn't provide opportunities for the students to configure the new informations; despite they stated that they are adequate in forming activities, they didn't arrange appropriate activities according to the level of the students and the current activities are not appropriate for the gains of the program; they also claimed that they are adequate in preparing portfolies, but it was found out that they didn't know the modern/contemporary methods and techniques that are needed for the preperation of portfolios and that they didn't carry them out at the requested level.

According to the observation results, the subject in which the teachers are most inadequate is the development of materials. According to the study of Özşaker and Orhun (2005) the official schools are inadequate at a proportion of %45,8 in subjects like field foundations and the sufficiency of tools-devices and the views of the teachers show not much differences according to their seniorities. In another study of Özsaker (2001) in which the views of the teachers are given, it is stated that the most important reasons why the physical education course doesn't reach its goal in official schools is that the course hours are inadequate- % 46 percent- and there aren't sufficient tools and devices- % 23 percent. In the study of Köksal (1995) it was found out that the teachers don't use course tools and devices in an adequate level and that this problem stems from the inadequacy of materials.

2. a) The question which is under the scope of the second sub problem; **"**does the views of the teachers about the measurement and evaluation dimension of the physical education course of the new education program of primary schools show differences according to the gender of the teachers?" was analyzed with an independent t test. According to the test the following findings were gotten and shown in table 4.

After analyzing table 4 we see a t test that was made with a .05 significance level about the views of the teachers on the measuremant and evaluation dimension of the new primary school physical education course program, it was found that there isn't a meaningful difference between the measurement-evaluation dimension and the gender variable. This difference is in favour of the male teachers (t= 5,657; p< .05). If we look at the data that were gotten we see that the arithmetical average of male teachers is $\bar{x}$ =19,48 and that the arithmetical average of female teachers is $\bar{x}$ =15,51. In other words the average proportion of male teachers is higher than the average of female teachers. According to this result it is seen that there is a meaningful difference in the averages in favor of the male teachers. Average and standard variance distribution values between the male and female teachers are comparable and despite the fact that the average of the male teachers is higher than the female teachers, the difference between these averages doesn't express statistically a meaningful difference. According to these data it can be said that the male teachers have fewer problems than the female teachers related with the measurement and evaluation dimension of the new first school physical education course program

b) The question which is under the scope of the second sub problem; **"**does the views of the teachers about the measurement and evaluation dimension of the physical education course of the new education program of first schools show differences according to the seniority of the teachers?" was analyzed with statistical processes and a one way variance analysis (Anova). According to the test the following findings were gotten and shown in table 5:

After analyzing table 5 in an Anova test that was made with a .05 significance level about views of the teachers about the measuremant and evaluation dimension of the new primary school physical education course program, because of the formula [$f_{(4-105)}$ = 8.475, p<.05] it is found that there isn't a meaningful difference between the measuremant-evaluation dimension and the seniority variable. According to these results it can be said that the views of the physical education teachers about the material dimension of the physical education course of the new education program of primary schools and the difference between the seniorites of the teachers are significant.

The Scheffe – Dunnett C multiple comparison tests were made to see between which groups the meaningful differences are found. According to the test results the difference lies between 1–3 and 2–3. According to this result the points of the measurement and evaluation dimension of teachers with an experience of 1-5 years is ($\overline{X}$ =17.09), the points of the measurement and evaluation dimension of teachers with an experience of 11-15 years is ($\overline{X}$ =21.67), the points of the measurement and evaluation dimension of teachers with an experience of 6-10 years is ($\overline{X}$ =16.33); so there is a meaningful difference between the views of teachers with an experience of 11-15 years ($\overline{X}$ =21.67). According to other twosome comparisons meaningful differences weren't found. This leads to the conclusion that the measurement and evaluation dimension of teachers who have an experience of 11-15 years is more positive than the dimension of teachers with experiences of 1–5 years and of 6–10 years.

According to the study of Yaşar and his friends (2005) teachers need to be educated about the measurement and evaluation dimension of the program and that they also definitely need to be educated in subjects like observation, work file, discussion, experiments, projects, study papers, students product file (portfolio) and performance evaluation which are all related with the dimension of the measurement and evaluation. According to the works of Gözütok and his friends (2005), teachers found themselves more inadequate in the subject of measurement and evaluation than in the other dimensions of the program. According to works of Yaşar and his friends (2005), it came out that the teachers need to be educated about the measurement and evalaution dimension of the program and that they also need to be educated in order to use the tools and devices for the measurement and evaluation dimension.

Suggestions

The student observation and measurement-evaluation forms should be arranged and their number should be less than before, the number of students in classes should be reduced, the assessment of homework and forms of students should be moved to an internet environment and the application period of the physical education course should be increased.

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❖ VARIA

THE EFFECT OF EIGHT-WEEK PROPRIOCEPTION TRAINING PROGRAM ON DYNAMIC POSTURAL CONTROL IN TAEKWONDO ATHLETES

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ABSTRACT

Objective: The purpose of this study was to examine the effects of 8-week training proprioception program on dynamic postural control in active taekwondo athletes.

Procedures and Methods: In this study, training group consisted of 13 male and 13 female taekwondo athletes whereas control group consisted of 8 male and 8 female taekwondo athletes, 42 taekwondo athletes in all. The subjects of dynamic postural control performances were analyzed by Biodex marked device (Biodex, Inc., Shirley, and NewYork 950-302). The measurements were taken twice as before and after proprioception training program applied three times in a week and per week of 8. Package program SPSS for Windows 15.0 was used in the evaluation of data statistically. The results were evaluated at the significance level of 0,05.

Results: At the end of training program,while female taekwondo athletes of experimental group were observed to have more performance in dominant,non-dominant leg dynamic postural control test($p<0.05$),no difference was determined in double –leg ($p>0.05$).

It was seen that there was no performance difference in post-test double leg,dominant and non-dominant leg dynamic postural control scores of female taekwondo athletes of control group.($p>0.05$)Whereas a significant difference was observed in double-leg,dominant and non-dominant leg dynamic postural control scores gotten at the end of training program applied to the experimental group of male taekwondo athletes ($p<0.05$), no significant difference was found in dynamic postural control test scores of control group ($p>0.05$).

Conclusion: In conclusion, it was thought that proprioception training program improves of female and male taekwondo athletes dynamic postural control performances.

Key Words: Proprioception, Dynamic Postural Control, Taekwondo.

INTRODUCTION

Two aims of postural control including the control of body position in space are accomodation and balance. Postural accommodation is described as the ability of maintain the suitable relation between body and body parts, the conditions in special tasks (DA. Winter, et all., 1998). Balance is a general term expressing to the dynamic preventing falling into place of body mass (T. Aydın, et all., 2002). It means individuals' continuing their body positions in stable and different conditions related to the environment. In rest and activity times, It is the postural accommodation for displacement in the centre of gravity affecting body (K.N. Clark, 2004).

In sports, balance requires a complicated accommodation of inner and exterior inputs. Generally balance is controlled by sensory inputs, central process, neuromuscular answers, vestibular, visual and propreioceptive system (E. Aydog, et all., 2006). Each of the sports techniques includes balance in some way. Balance plays an important role in keeping body composition that is necessary for the successful performance in sports (M.A. Sandrey, 2006).

Postural control and propreioception are two dependent variables examined under balance training. It has been determined that postural control and propreioception are often developed through neuromuscular and propreioceptive training programs (A.S. Kemerley, 2001). The aim of propreioceptive training is to improve neuromuscular system for complicated activities. While static and dynamic activities are being applied, nervous systam enables body to keep its balanced position and makes information from periferal reseptors through efferent ways possible (S.G.T. Balter et all., 2004, J.L. Huston, et all., 2005, S.S. Salaj, D. Milanovic And I. Jukic, 2007).

Taekwondo is a movement sports and the balance which is important for athletes is the dynamic balance. Dynamic balance is required for giving a kick. Here, body is exposed to an exterior load, the centre of gravity always changes and generally increases. The feet are used as the most important factor in keeping balance (Kemerley A.S., 2001, Stefanek, K.,1998).

Stefanek says that dynamic postural control and balance are quite important for a taekwondo athlete and effective factors in applying techniques. He claims that the athlete should stand on support leg still in order

to apply an effective technique to the target area. He also points out that many taekwondo techniques are rather difficult and they potentially include both flexion and extension and dynamic postural control has an important role to apply true kick techniques in taekwondo sports (K. Stefanek, 1998).

The aim of this study is to examine the effect of eight-week propreioception training on dynamic postural control in active taekwondo athletes.

MATERIAL AND METHOD

Subjects

21 males and 21 females actively doing sports, 42 healthy athletes in all, participated in the study. The training group consisted of 13 male and 13 female taekwondo athletes and the control group consisted of 8 male and 8 female taekwondo athletes.

The subjects were chosen from the athletes who didn't have neurological, vestibular-visual illness in last one year and a serious lower extremity injury in last 6 months. Before application, subjects were told about the tests in the study and they were made to sign a document showing their volunteering. Ethical committee approval no 2009/186 was taken from Seljuk University Meram Medicine Faculty.

Postural control measurements

Biodex marked postural control system (Biodex, Inc., Shirley, New York 950-302) was used for dynamic postural control measurements. The measurements were done twice as before and after proprioception training program applied three times in a week and for 8 weeks. Subjects participated with suitable sports clothes for balance tests and as barefoot. Subjects were allowed to do enough practises to minimize the effect of learning before test.

The foot coordinates of subjects were determined and the same coordinates were used in all tests. Subjects applied the test as the knees were in a slight flexion 45, on dominant and non-dominat leg, the other leg was in 90' flexion from knee and arms were crossed on chest. During the test, the screen was closed and the subjects were told to look at a fixed point at eye level and one meter away. Dynamic control test was applied as at 3rd level ,with open eyes and on double leg, dominant and non-dominant leg. 3 repetitions for 20 seconds were done for each balance parameter. Breaks for 30 seconds were given between tests.

Figure 1: Biodex Postural Control System

Propreioception Training Program

The propreioception training program used in this study was adapted from exercise programs used in studies through literature scanning(Bert R. M. et all., 2005, Chong R.K. et all.,2001, Kemerley A.S. 2001, Lephart, S.M., et all.,1997, Paterno M. V. Et all. 2004, Söderman K. et all.,2000, Verhagen E.,2004).

8 –week process consisted of 5 –minute warming up, 20 –minute propreioception training program and 5-minute cooling parts and was for 30 minutes in all and applied 3 times in a week. Training sets were started with 10 seconds,6 repetitions and 10-second breaks between sets. After second week, repetitions numbers were slightly decreased, the time of standing on wobble board and break-time were increased 5 seconds and in last week ,the subjects applied each exercise on wobble board with 35 seconds,1 repetition and 35-second break. The subjects applied training in first 4 weeks as open-eyed and closed-eyed on smooth surface and wobble board. After 5 th week, subjects went on the training only on wobble board.

Double Leg Unilateral Leg

Figure 2: The sample from Proprioception Training

Statistical analysis

SPPS for Windows packet program was used in evaluating and calculating the acquired data. The measured variables were summarised by giving the

average and standard deviation. The normality distribution of measured parameters was determined through Shapiro-Wİlks test. Since data didn't have normal distribution,non-parametric tests were prefered in comparisons between groups. In pre-exercise and post-exercise, Mann-Whitney U test was used in comparison between experimental and control groups and Wilcoxon test was used for the comparison of differences between pre-test and post-test. In this study, the significance level was taken as 0.05.

FINDINGS

The demographic features of athletes participated in the study are shown in Table 1.

The pre-test and post-test comparison about dynamic postural control scores of all taekwondo athletes is seen in Table 2. At the end of statistical analysis, whereas no significant difference has been found in pre-test values, significant difference has been determined in post-test dynamic postural control scores($p<0.05$).

In Table 3, the comparison of pre-test, post-test dynamic postural control scores of female taekwondo athletes is seen. It has been found that double-leg, dominant leg, non-dominant leg dynamic postural control scores between experimental and control group have no significant difference ($p>0.05$).

The comparison of dynamic postural control scores before and after training program of experimental and control group of female taekwondo athletes is seen in Table 4. Whereas no significant difference is seen in double-leg dynamic postural control scores ($p>0.05$), a significant difference has been found between dominant and non-dominant leg pre-tast and post-test dynamic postural control scores ($p<0.05$).

In table 5, the comparison of pre-test, post-test dynamic postural control scores of experimental and control group of male taekwondo athletes is seen. No significant difference has been found in double-leg and dominant leg pre-test dynamic postural control scores between experimental and control group ($p>0.05$). As for post-test dynamic postural control scores,whereas a significant difference has been found in double-leg and dominant leg between experimental and control group ($p<0.05$), no significant difference has been determined in non-dominant leg dynamic postural control scores ($p>0.05$).

In table 6, the comparison of before and after training program dynamic postural control scores of experimental and control groups of male taekwondo athletes is seen. Whereas a significant difference is seen in all dynamic postural scores of experimental group ($p<0.05$), no significant difference has been found in control group ($p>0.05$).

DISCUSSION and CONCLUSION

In this study, examining the effects of 8-week proprioception training program on dynamic postural control in active taekwondo athletes has been aimed.

Postural control and balance are described as the ability of making adaptations to keep body's gravity centre on support surface or maintain these adaptations (M.A. Hoffman, V.G. Payne, 1995, A.S. Kemerley, 2001). These adaptations happen through ankle, knee and hip's movements and may be destroyed when gravity centre and support surface are damaged (Kean C.O., 2006). In researches, postural control was examined with the aim of applying various training programs in individual and team sports, preventing its effect and injuries (R. M. Bert, et all., 2005, R.K. Chong et all.,2001, M. V. Paterno, Et all. 2004, K. Söderman, et all., 2000, E. Verhagen, 2004). In these studies, it was reported that at the end of balance trainings carried out, force improved and muscular imbalance decreased (J.A. Balogun, et all. 1992, H.C. Heitkamp, et all. 2001).

In this study, when the dynamic postural control scores measured after training program were examined, it has been found that experimental group taekwondo athletes have higher dynamic postural control performance than control group and they are statistically significant. Although taekwondo naturally requires basic posture and techniques improving dynamic postural control. it has been determined that the propreioception training program applied to the experimental group improves taekwondo athletes' dynamic postural control performances.

In their studies where they investigated the effect of proprioception training program on healthy people, Hoffman and Payne (1995) applied a training program being for 10weeks and 3 days in a week to the experimental group. Pre-test, post-test dynamic postural control results of the subjects were gotten through Kistler Force Platform. They found that dominant leg dynamic postural control scores of experimental group significantly improved when compared to the control group. Also,they reported that propreioception training program increased the dynamic postural controls of subjects and could be useful for person movement (Hoffman and Payne, 1995).

In their studies on figure skaters, Kovacs and his friends researched the effect of neuromuscular training program on postural control. In the research, whereas experimental group (n=22) applied neuromuscular program for 4 weeks and 4 days in a week, the control group (n=22) applied basic training program only for figure skating. Before and after training, the subjects' postural controls were measured on a force platform and in the light of the acquired results; experimental group was found to have rather improved their dynamic postural control performances when compared to the control group (E.J. Kovacs, et all.2004). Beside these findings show parallelism with the acquired results, they also support propreioception training program in addition to the athletes' training programs that are peculiar to their own branches.

Whereas experimental group female takwondo athletes were found to have higher performance in

dominant, non-dominant leg dynamic postural control test after training program, no difference was found in double-leg.

In their studies, Paterno and his friends (2004) examined the effect of 6-week neuromuscular training program on female handballers' postural controls. 41 female handballers studying in high school participated in research and a 6-week and 20-minnute propreioception training program was applied to the athletes 3 days in a week. The postural controls of all athletes were measured by Biodex Stability System. After training program, they found that there were important improvements statistically about handballers' double-leg, dominant and non-dominant leg postural controls. Also,they described balance training as the exercises that could be included in planned and various trainings that were focussed on maintain the balance without change on support surface and postural awareness(M.V. Paterno, et all., 2004).

In a research carried out by Holm and his friends (2004), 35 Elite female handballers participated and propreioception training program was applied to the players. The handballers' dynamic postural controls were measured by KAT (Kinesthetic Ability Trainer) 2000 device before and after the training. At the end of pre-test, post-test comparison, they reported that the applied training program improved female handballers' dynamic postural controls and prevented possible injuries (I. Holm et all. 2004). These results of the research show parallelism with the findings of our study.

Lephart and his friends (1997) reported that regular training increased the development in neuro-sensory and motor ways and decreased the risk of injury by affecting propreioception sense positively (S.M. Lephart, et all., 1997).

A significant difference was found in double-leg, dominant and non-dominant leg dynamic postural control scores acquired at the end of the training program applied to the experimental group of male taekwondo athletes. Also, whereas a significant difference was found in double-leg and dominant leg in the comparison of post-test dynamic postural control scores of experimental and control groups, no difference was seen in non-dominant leg. In taekwondo trainings, generally dominant leg and fists are effectively used. Whereas dominant leg techniques are hard and effective, non-dominant leg techniques are weaker and away from necessary technical level. In our study, at the end of comparison of experimental and control groups' dynamic postural control scores after propreioception training program; the reason why no significant difference was found in non-dominant leg dynamic postural control scores is thought to result from athletes' using their bodies unilaterally.

Gioftsidou and his friends (2006) examined the effect of balance program on footballers. 39 footballers participated in the research. While control group (n=13) continued only the football trainings ,one of the other experimental groups (n=13) applied the balance program before football training and other experimental group(n=13) applied after football training. Balance program was applied for 12 weeks,3 days in a week and 20 minutes in a day. The balance skills of athletes were evaluated by Bıodex Stability System. At the end of comparisons of pre-test,post-test, significant differences were determined in both of the experimental groups' balance skills (Gioftsidou A. et all.,2006).

A similar research was carried out by Malliou and his friends (2008). In their sutides where they examined the effect of balance program applied before and after the regular tennis training on upper-level tennis players, while control group only applied tennis training, one of the experimental groups applied balance program before tennis training and other applied after tennis program. The balance performances of all tennis players participated in the study were measured by Bıodex Stability System and players participated in balance program for 12 weeks, 3 days in a week and 16 minutes. At the end of 12 weeks, whereas no significant difference was found in control group, they reported an important development in dynamic balance performances of experimental group (V.J. Malliou, et all. 2008).

In a research where the effect of propreioception training program was examined on dynamic postural control, while propreioception training program was being applied to the football experimental group 2 days in a week and for 20 minutes during the competition season, the control group only continued the football training.Also, dynamic postural control tests of footballers were measured by Bıodex Stability System. At the end of the research,it was determined that propreioception training program improved footballers' dynamic postural control performances and the rate of injury decreased (C. Hrysomallis, 2008). It is seen that the results of the research show parallelism with our study and support the findings of our study.

The limitedness of this research is that the athletes did the training in two different halls and with two diffeent trainers although training surfaces and weekly training numbers were the same. It is thought that taekwondo athletes' were being trained by only one trainer in later studies will reflect the possible changes on postural control performance beter.

To conclude, It has been observed that propreioception training program improves the dynamic postural controls of male and female taekwondo athletes. Giving place to the studies that can improve propreioceptive features in Taekwondo trainings may help the athletes increase their postural controls to the maximum level. As a result of this, it is thought that the performances about technical applications of taekwondo athletes in trainings and competitions may increase and possible disabilities may be prevented.

Table 1: Female and Male of Taekwondo Athletes Demographic Characteristics (Mean ± SD)

Variables	*Groups*	*N*	*Female*	*Male*
Age (Year)	**Experiment**	13	20,92 ± 1,55	20,23 ± 2,80
	Control	8	20,75 ± 1,66	19,87 ± 2,29
	Total	21	20,85 ± 1,56	20,09 ± 2,56
Height (cm)	**Experiment**	13	166,77 ± 8,36	174,85 ± 6,97
	Control	8	165,62 ± 7,59	173,75 ± 5,06
	Total	21	166,33 ± 7,90	174,43 ± 6,20
Weight (kg)	**Experiment**	13	56,69 ± 6,89	62,80 ± 4,95
	Control	8	61,50 ± 7,27	70,50 ± 14,55
	Total	21	58,52 ± 7,26	65,74 ± 10,17
BMI (kg/m^2)	**Experiment**	13	20,36 ± 1,72	20,58 ± 1,94
	Control	8	22,41 ± 2,40	23,27 ± 4,17
	Total	21	21,14 ± 2,20	21,61 ± 3,18
Sports Age (Year)	**Experiment**	13	9,23 ± 2,31	8,62 ± 2,56
	Control	8	6,00 ± 1,07	6,23 ± 1,36
	Total	21	8,00 ± 2,49	7,14 ± 2,19

Table 2: All of Taekwondo Athletes Comparison Pre-Test And Post-Test of Dynamic Postural Control Scores

Dynamic Postural Control		**Groups**	**Female**	**Male**	**U**	**p**
Pre-Test	**Double Leg**	**Experiment**	1,91 ± 0,56	1,98 ± 0,31	175,50	0,398
		Control	1,85 ± 0,50	2,34 ± 0,54		
	Dominant Leg	**Experiment**	2,20 ± 0,56	2,57 ± 0,58	129,50	0,058
		Control	2,45 ± 0,48	3,06 ± 0,58		
	NondominantLeg	**Experiment**	2,37 ± 0,89	2,83 ± 1,10	144,00	0,097
		Control	2,86 ± 0,82	3,22 ± 0,93		
Post-Test	**Double Leg**	**Experiment**	1,65 ± 0,55	1,69 ± 0,34	107,00	0,009*
		Control	1,92 ± 0,71	2,46 ± 0,42		
	Dominant Leg	**Experiment**	1,90 ± 0,66	1,90 ± 0,48	60,00	0,000*
		Control	2,45 ± 0,74	3,33 ± 0,95		
	NondominantLeg	**Experiment**	1,88 ± 0,70	1,90 ± 0,54	110,00	0,011*
		Control	2,30 ± 0,49	2,55 ± 0,72		

** P<0.01 * P<0.05

Table 3: Experiment and Control Group of Female Taekwondo Athletes Dynamic Postural Control Scores Comparison of pretest-posttest Values

Dynamic Postural Control		**Groups**	**Means**	**U**	**p**
Pre-Test	**Double Leg**	**Experiment**	1,91 ± 0,56	49,00	0,828
		Control	1,85 ± 0,50		
	Dominant Leg	**Experiment**	2,20 ± 0,56	38,00	0,309
		Control	2,45 ± 0,48		
	Nondominant Leg	**Experiment**	2,37 ± 0,89	37,00	0,276
		Control	2,86 ± 0,82		
Post-Test	**Double Leg**	**Experiment**	1,65 ± 0,55	39,50	0,364
		Control	1,92 ± 0,71		
	Dominant Leg	**Experiment**	1,90 ± 0,66	26,00	0,059
		Control	2,45 ± 0,74		
	Nondominant Leg	**Experiment**	1,88 ± 0,70	31,50	0,137
		Control	2,30 ± 0,49		

Table 4: Experiment and Control Group of Female Taekwondo Athletes Dynamic Postural Control Scores Comparison of pretest-posttest Values

Variables		Z	p
Experiment Groups	**Double Leg**	-1,170	0,242
	Dominant Leg	-1,992	0,046*
	NondominantLeg	-2,503	0,012*
Control Groups	**Double Leg**	-0,509	0,611
	Dominant Leg	-0,105	0,917
	NondominantLeg	-1,542	0,123

*P<0.05

Table 5: Experiment and Control Group of Male Taekwondo Athletes Comparison Pre-Test And Post-Test of Dynamic Postural Control Scores

Dynamic Postural Control		Groups	Mean	U	p
Pre-Test	**Double Leg**	**Experiment**	1,98 ± 0,31		
		Control	2,34 ± 0,54	28,500	0,089
	Dominant Leg	**Experiment**	2,57 ± 0,58		
		Control	3,06 ± 0,58	25,000	0,053
	NondominantLeg	**Experiment**	2,83 ± 1,10		
		Control	3,22 ± 0,93	34,000	0,190
Post-Test	**Double Leg**	**Experiment**	1,69 ± 0,34		
		Control	2,46 ± 0,42	5,00	0,001**
	Dominant Leg	**Experiment**	1,90 ± 0,48		
		Control	3,33 ± 0,95	2,50	0,000**
	NondominantLeg	**Experiment**	1,90 ± 0,54		
		Control	2,55 ± 0,72	26,00	0,058

** P<0.01

Table 6: Experiment and Control Group of Male Taekwondo Athletes Comparison Pre-Test And Post-Test of Dynamic Postural Control Scores

Variables		Z	p
Experiment Groups	**Double Leg**	-2,251	0,024*
	Dominant Leg	-2,719	0,007*
	NondominantLeg	-3,102	0,002*
Control Groups	**Double Leg**	-0,562	0,574
	Dominant Leg	-1,051	0,293
	NondominantLeg	-1,549	0,121

* P<0.05

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PHILOSOPHICAL CONCEPTS OF SOME OF THE MODERN SUMMER OLYMPIC SYMBOLS

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ABSTRACT

The Olympic Games is extremely serious, this is not the product of coincidence, as they deserve to study scientific study of not less than the specialized areas of analytical studies, such as religious sects or political, economic or natural phenomena and psychological symptoms. That any group is holding humanity so much and take them all this time and care, investment and deserves debate and understand that we understand its causes and characteristics in order to understand ourselves and the way human nature is deeper. Greek Olympics for example docked with the senses and values were not just a sport practiced even docked Palmtheologia * ancient Greek. The Olympic movement work is rare in human society because they reflect the multiple functions of the movement beyond the power of sports and influential within the framework of the sport, and led to a series of significant impacts in the political, economic, philosophical, educational, cultural, artistic and media and many other areas. Because the Olympic movement did not constitute the cultural landscape of sports in modern society and you will be happy people of their own cultural, but also drive people to progress continuously humanitarian spirit. True that the first session of the modern Olympic Games were held in Athens in 1896... But also true that these games known as the culmination of years of evolution over the twentieth century, and decrees adopted by the flame and the Olympic flag into the opening and closing ceremonies large and impressive even turning to organized competition between States and boasted of the area between the cities, became the summer Olympic games biggest sporting event in Earth, but the biggest humanitarian activity in the history of mankind, has become a major festival which mixes art and sport technology, and product mix is impressive. In spite of the twentieth century was the century of wars and ideologies and major conflicts, but it was also the century of technical revolution, a century sport, which reached its practice and take care of it, and major events of the Olympics and world cups to the peak. Hence the importance of research to identify some of the concepts of symbols Olympic Games of the modern summer.

Methods

Curriculum research: the historical approach was used to dictate the nature of the current study. "Interested in this method to collect facts and information through the study of documents, records and effects, and is used in the study of phenomena, events and attitudes which has a long or short time. And the sense that this method of research is to study the past, events And thus can not control the variables as is the case in empirical research. Frenkle & Wallen: 1993, 316))

Results:

Whatever the symbol takes place in contemporary studies of cash, and almost did not find the philosophical study does not include a chapter or more on the symbols. The reason for that is - primarily due to increased Dalai symbols, language and objectives of the modern era. And privileged to attend it. In order to determine the significance of the terminology code (signal a banner) we say: Symbol word, or phrase, or image, or personal, or the name of the place contains within more than one sign, including the polar linking major. The first is the apparent dimension of the symbol, which is received directly from the senses, is the second dimension subcontractors or dimension beyond understanding exegesis only through symbol. There is a strong relationship between the visible symbol and the subsoil. Linked to levels of use of the symbol, and deal with him, as well as to suggest strength and representation, the development of creative awareness, and its ability to abstract. The allegation that the symbol in its infancy did not refer to anything beyond (what), whether expressed by suggesting or sound or movement or any other form. These first attempts to shed some light on the world of Olympic symbols and sports also shown us will see in parts of this research, new indications regarding the nature of the world of symbols and thus human nature itself. King human being symbolic of the stock to cover the enormous human nature.

1 - **Philosophical concepts of the Olympic flag:**

The choice of flags and symbols Spars are striking for all, a unique combination of elegance and strength and simplicity. And because human beings dwell in venerating these symbols, the flags and Spars focused mostly in the most beautiful locations where the sight of the largest possible number of people.

"I saw first, regardless of the color of cloth and endured images, symbols and slogans, they serve as an umbrella symbol revolves around his friends, who are often the owners of one case in particular in the battle" (Thames &Hudson; 1972,19). The five rings of different colors reflects the continents of the planet is composed of expression in workshops or services without other geometric shapes, perhaps for connections first, then the depth of expression and potential written diverse. It is for the Chamber geometric form that knows no end, because everything else with the angles The sharp angles or sharp ridges end. Revolving if the best expression of continuity, survival and longevity, completeness and containment, without bias to a point on the ocean, or in the dimension of the Centre from any side of the Pacific is

the symbol of Kony to get the words reflect the synchronization and harmony and unity College, and supplements And advice and eternal Interminableness.

2 - **The philosophical concepts of the Olympic opening:**

Olympic life seeking to exchange and integrate different cultures, and the fact that the Olympic Games and the Olympics both Festival activity aimed at achieving the exchange and integration of cultures in the world of sports At the same time is suitable joint benchmark for real dialogue and exchange between different nations of the world. Inaugural manufactured succeeding generations in every city In a world cultural heritage bears the personal stamp of their city, which show the effects of belief, culture, customs and traditions, whether such a purely intellectual heritage bid; literature, philosophy and other humanities, or tender material produced by science and action; such as architecture, appliances and machinery, tools and means of livelihood war, and So.

3 - **Philosophical concepts of the Olympic postage stamps**:

Olympic stamps that tell how civilized development witnessed in the Olympics, and these stamps - Telling the era of Olympic history, and really reflect on the sense of cultural and literary enjoyed by the perpetrators of such idea, and telling about the history of the Olympic Games. The researcher believed that the wealth of Olympic stamps deserve great civilization preserved and documented in specialized centers, as recorded Olympic history, and explains a lot of shifts and changes undergone by the Olympic Games in the march of peoples lives.

The importance of postage stamps is that they link between peoples of different countries, therefore, whatever helped distances, including the means of communication with them has become easier through providing postal services between these countries and less expensive than other means of communication available.

-Discussion / Conclusion:

1 - invested Olympic Games uses modern technology in communications, economic, political and cultural between the peoples of the world significantly.

2 - The Olympic Games are not a major festival for athletes but also for volunteers and volunteer corps of vital activity, competence and qualifications of the conditions of the success of hosting the Olympics.
3 - Achieved a global philosophy of the Olympic Games and circulated in full dimensions did not object to it one has been questioned by anyone. And former world governments and peoples wish to enter the Olympic Games in its entirety without modification suits local nature.

Key words: economic, Olympic Games, political, religious.

Introducere1 - Definition research:

1-1 provided and the importance of research:

The Olympic Games is extremely serious, this is not the product of coincidence, as they deserve to study scientific study of not less than the specialized areas of analytical studies, such as religious sects or political, economic or natural phenomena and psychological symptoms. That any group is holding humanity so much and take them all this time and care, investment and deserves debate and understand that we understand its causes and characteristics in order to understand ourselves and the way human nature is deeper.

Greek Olympics for example docked with the senses and values were not just a sport practiced even docked Palmtheologia * ancient Greek.

The Olympic movement work is rare in human society because they reflect the multiple functions of the movement beyond the power of sports and influential within the framework of the sport, and led to a series of significant impacts in the political, economic, philosophical, educational, cultural, artistic and media and many other areas. Because the Olympic movement did not constitute the cultural landscape of sports in modern society and you will be happy people of their own cultural, but also drive people to progress continuously humanitarian spirit. True that the first session of the modern Olympic Games were held in Athens in 1896.. But also true that these games known as the culmination of years of evolution over the twentieth century, and decrees adopted by the flame and the Olympic flag into the opening and closing ceremonies large and impressive even turning to organized competition between States and boasted of the area between the cities, became the summer Olympic games biggest sporting event in Earth, but the biggest humanitarian activity in the history of mankind, has become a major festival which mixes art and sport technology, and product mix is impressive. In spite of the twentieth century was the century of wars and ideologies and major conflicts, but it was also the century of technical revolution, a century sport, which reached its practice and take care of it, and major events of the Olympics and world cups to the peak. Hence the importance of research to identify some of the concepts of symbols Of the modern summer Olympic Games.

1-2 research problem:

Themes of philosophy evolved through successive historical periods, this is not the result today, because the word philosophy calls often are popular to refer to any form of knowledge absorption, it may also refer to a personal perspective on life. As for the historical philosophical concepts, which aim to provide the rights to enable it to understand the meaning of the events of present or future in the light of past experience? And the meaning of the Olympic symbols

and what are aimed symbols that have evolved significantly in the courses of modern summer Olympic Games. Given the variety of phenomena, things have diversified mutual ties and their implications are diverse in turn, all that is of the utmost importance from the perspective of scientific analysis revealed that the concrete reality of these linkages and their effect is to detect the substantive laws of the world as a binding condition for the activity of people's practical and scientific. So we say that the task of science is certainly Knowledge of laws and armaments in the application, which makes us inclined to question the future, what are the philosophical concepts of the modern summer Olympic symbols? To answer this question we must highlight the dimensions of the concepts and philosophies of modern summer Olympic and study and analyses in depth.

1-3 objective research:

Research aims to identify:

1-3-1 philosophical concepts of some of the symbols of the modern summer Olympic Games.

1-4 frontiers of research:

1-4-1 temporal: in 1896 until in 2004.

1-4-2 spatial: College of Physical Education / University of Mosul.

1-5 define terms:

1-5-1 concepts: the meanings of ideas is not the meanings of words, the link between words and ideas is that the meanings of words came to the delivery of those meanings. The concepts actually consists of linking information or to link information from reality, it means that much reality in the arena and not merely an explanation of things which imposes mere existence of reason, human beings could put his finger on what meanings. (Network of Arab horsemen / http: //www. forsan.net / index.htm) and procedurally researcher agrees with this definition. Abdul Salaam Mesdoua. Linguistics and cognitive foundations (Tunisia: Tunisian House Publishing, 1986) p. 11 20
1-5-1 philosophical concepts: the meanings that have realized our reality in our minds whether or tangible reality for granted and otherwise of the meanings of words and strings are called concept but merely information, consisting of philosophical concepts linking the reality of linking information or information Reality, and perceptions have meant that much reality in the arena and not merely an explanation of things which imposes reason mere existence, and man can put his finger to it. (The definition of a procedural)

1-5-2 philosophy and big eye defined as "a tool consciences and machine thoughts and the outcome of the mind and a tool to learn races and the elements and informed the symptoms and gems and ills of people and different ethics and character, qualities and instincts. (Gabri, 1985: 26) and the researcher agrees with the definition of big eye procedural.
1-5-2 Olympic symbols: the signs and symbols and abbreviations used in multiple Olympic Games to refer to the attributes and relationships and symbols of the host country for the Olympics, aimed at facilitating the country's definition, because the Olympic symbols were still since time immemorial reflect on the history of the country (sports, and economic , And political and many others. And write or paint or symbols are printed in full or referred to by abbreviations symbolism.

2 - Theoretical studies and previous studies:

2-1 theoretical studies:

2-1-1 Elements of the modern Olympic Games

2-1-1 Olympic anthem: The first pay tribute delivered at the first Olympic "the Athens in 1896", to quote a song from the old Greek sports, inaugurated the first Olympic Games of the modern era. The poet wrote "Costas Tamas *" What a genius foot rule, the father of right and good and beautiful, down to the ground and under the sky, a witness to Your glory, Anrna radiation. "The French Baron" Coubertin "think that accompany sporting competitions, the dumping of poetic couplets in Unifying vision of human potential. The International Olympic Committee Olympic anthem at its No. (55) in the city of Tokyo in 1958, and deposited the music of this anthem at the headquarters of the International Olympic Committee.

2-1-2 Olympic section: In 1906, a French Baron "Coubertin," the official part played by athletes. And introduced formally to take part the Olympics in 1920, in the "Anfrs" Belgium. The one section of athletes on behalf of his colleagues, and it must be costing the sports section Olympic hurled at the opening of the Olympic athletes. The first section of the delivered in 1920, the player is "Victor Point", who have won several gold medals, silver, bronze, in the arms competitions, water polo, and reportedly in Section player raising his right hand and catching his left hand Olympic flag carried by another athlete: "On behalf of all Competitors, I swear that share these Olympics, and we respect and abide all the laws that govern these games, and pledge to practice sport clean building on the requirements of true sportsmanship and to preserve the glory of sport and respect for the reputation Frguena." (Reaih and forward, 1987: 44)
In (the Sydney Olympics in 2000), included a new section for the first time in the history of the Olympics says: "We pledge not to the world athlete of fraud", and also included another paragraph says: "We pledge to exercise a clean sport free of stimulants." And dropped this section of the Australian hockey player, "Rachel Hawks (ranked first world hockey for five years)" on behalf of all athletes participating in the session. (http://ar.wikipedia.org/ 2004) The Department of rulers who shall rule (from the host State), on behalf of all the rulers echoing Section rulers. On behalf of all athletes, referees and officials swear that we arbitration games in this Olympic Games the most neutral and respect all laws and regulations governing these games governors on sportsmanship exclusive there. (Winds and forward, 1987: 44)

2-1-3 Olympic Charter "Action is the Constitution of the Olympic movement, organizing the Olympics, which combined provisions and laws,

approved by the International Olympic Committee. In the case of a dispute or disagreement over the interpretation or application of these resolutions, which are separated by the Executive Office of the International Olympic Committee? In some cases through arbitration before the sports tribunal which was established in 1993, consists of twenty Court judge, is a supreme body independent of the International Olympic Committee.

2-1-4 Language "The official languages of the International Olympic Committee is French and English ... We must provide all the meetings of the International Olympic Committee simultaneous interpretation equipment to conduct meetings in Spanish, Russian, German and Arabic with the exception of extraordinary meetings, when a dispute erupted between French and English text taken... Meaning the French text." (Badawi, 1996, 154)

2-1-5 Olympic motto: "Citius Altius Fortius" These words have been translated into several languages and meanings.

A. Translated by the order in the sense: speed, the lifting force.

B. Translated by the order meaning: foot, nobility, strength.

C. Translated by the order in the sense: "Be prepared", "Be quick," "Be High." Following a Greek, tongues were covered in Utopia. It is intended to express the aspirations of the Olympic sports, has emerged this logo for the first time in a "cycle Anfrs" in 1920, in Belgium and formulated this logo is a Dominican priest "Father Byron" for university students. This was a monk friend Baron de Coubertin. (Abdul-Hamid and others, 2001: 96)ttp: / / www2.lhric.org/pocantico/olympics/olympics.htm/2006/p6)]

2-1-6 Olympic symbol: "Is to design a coherent, which overlaps the Olympic five episodes, with another element; must provide all Olympic symbol, to the Executive Office of the International Olympic Committee, for adoption.

2-1-7 slogan formal session: We must take every Olympics slogan distinguishes them from other courses, and printed publications each session, and the means of propaganda for the session. The difference between the Olympic symbols, the Olympic motto, is the five rings, the Olympic symbol to be there when the five rings, either emblem private courses, the city the right to merge these seminars with other elements or dispensed with."http://www.britannica.com/eb/article-9108519/Olympic-Games))

2-1-8 Olympic flag: "Olympic flag is a flag without the edges are made of white silk, and five workshops in their overlapping, three workshops in the first level also comes colors: blue for a first and be near the force, and the color symbolizes the continent of Europe, the blackness of a second and symbolizes the continent of Africa, And red for a third symbol for the Americas. The second level, the first link is close to the force, and the yellow color symbolizes the continent of Asia, and the second and final color green symbolizes the continent of Australia. The idea of the Olympic flag at the International Conference for the Olympics in 1910, and established a special committee to prepare him. The Olympic flag created in 1913, when it began Coubertin, is thinking of making a special flag for the Olympic courses. Baron wrote in the "Olympic Magazine", published in August 1913, saying: "These five rings represent the five continents in the world, starting from this moment, and reflect the five rings on the acceptance of fruitful and constructive competition, as well as the six colors, including the Ground white, representing the colors of all nations without exception. The "Coubertin," always connect between the old and modern, linking between the "sacred truce" at the Olympics old, who was a symbol of peace in the past, and the flag of the white flag; symbol of peace in the present, and five rings, which codified the Convention on the sacred truce, making them A symbol of solidarity and brotherhood five continents between peoples. The Olympic flag appeared for the first time officially in 1914, in the cities "Paris" French and the City "Alexandria" the Egyptian; in the same time celebrate the twentieth anniversary of the Olympic courses. The flag was raised in Alexandria, within the African Games in the fifth of April. When the Greek deliberately "Angelo Bolannaki" resident in Egypt, the first representative of the International Olympic Committee in Egypt and the Arab world, the call to contribute in building sports stadium in Alexandria. And by Baron to the International Olympic Committee in 1914 at Sorbonne University in Paris, where it was ratified in 1914. The flag was raised in 1915, in San Francisco, and decides a shelf in the course of science in 1916 for the first time in Berlin, however, by World War I prevented that. The lift in the Swiss city of Lausanne permanent headquarters of the International Olympic Committee in 1919. In 1920, the Belgian government informed the design of Olympic great, and dedicated the Belgian government of the Belgian Olympic Committee, which in turn donated to the President of the International Olympic Committee "Coubertin," he agreed it was lifted at the seventh "cycle Anfrs" Belgium. Since that session, this has become the Olympic flag is the flag even in 1984 In in 1984, the city "Seoul" South Korea's new Olympia note of the International Olympic Committee, raising the flag this time in the first session of Seoul in 1988, and there is informed by another Olympic city "Oslo" Norwegian in 1952, was used at the Olympics Winter. Article No. (24) of the basic principles of the Olympic movement, to raise the Olympic flag in the Olympic Village, beside the other flags of teams participating, whether in the stadium opening, or in the surrounding areas, with the flags of States participating in the session. They should fly the flag at the Olympic large force installed in a prominent place stadium, and begins lifting the Olympic flag, with the announcement of the opening of the Olympic record, and get them

when officially declared the conclusion of the Olympics, and after that recognizes the official city held by the next session. Linux and the Olympic flag during the session, for reasons it deems the International Olympic Committee. The Olympic flag in the housing cycle "Sydney 2000", when the death of wife, "Samaranch," the International Olympic Committee President then. (Copyright © Jelsoft Enterprises Limited 2000

2-1-9 modern Olympic flame: "IGAD is a moment of the Olympic flame, raising moments at the ceremony, the Olympic Games start immediately after the IGAD, and the origin of this tradition, as the German researcher says" No ", is" the urgent need for new lighting and illuminator sacred, "and the torch in the past sent a symbol of , And power dynamics and vitality of the universe, and then became a slogan for the permanency of the spirit gods, and in the modern era Olympic torch become a symbol of peace and appeal to the world that departs from the war and join hands and fraternity. The president said the fifth of the International Olympic Committee "EVRY Brandeg," When I got the torch from Olympia to Munich (1972 m), "The torch carried the message to Munich from Olympia, a message of equal opportunities for all and non-discrimination, friendship and international cooperation." And fuelled the torch for the first time officially in a "cycle Berlin in 1936" after the Germans made a request to the International Olympic Committee, to formally introduce the tradition of the torch at the Olympics, and transfer to the city of Olympia "Berlin", the German proposal in the "Oslo" in 1935. He succeeded Dr. "Carl Daym" in organizing the first flight of the torch from Olympia to Berlin, and the hostile campaign of all States that have passed the torch, the first of her pregnancy from Olympia Greek hostility "Constantine Bondesson" remained the torch burning for days in session until the closing ceremony extinguishing. (Winds and forward, 1987: 45) It means IGAD flame in Olympia, and then transferred to the city hosting the session, Olympia waived its right to establish the Olympic Games, the city's hosting of the session. The Olympic flame fired at the foot of Mount "Alaolmbos" in Greece, from the sun with concave Women Runners then carried out sequentially, until you reach the venue for each session and hostility of those special Shaalan, fuelled by his colleague from the torch, which was preceded by the enemy, so they reach the city, That will be raised by the session, one day before the start of the session, other national runner stoking the flame alive remain standing for the duration of the session and Runners representing Greece and the countries located between Greece and the host city, and in some cases involving ships and aircraft to carry the torch across the sea and mountains. The torch shall be material combustion does not emit smoke which pollute the environment, in order to preserve the environment, exclude the cities with a high rate of environmental pollution from candidature to organize the Olympics. In the "Sydney 2000", passed the torch underwater in northern Australia, for the first time in modern Olympic history courses. And Olympic officials said: "The torch was passing through the area of tropical coral reefs are rubbish, and used a special chemical for a period of two minutes and 40 seconds, before the "Wendy Craig," a Marine, a pick-up were still burning. " Olympic officials said: "The resurgence of the flame of the torch underwater three meters was strong to the extent that prevented the entry of water into the tube and extinguish the flame. In in 2004 Olympic course was held in the city of Athens, Greek, the Greeks identify torch march from Greece to all countries of the world, then returned again to Greece, before the start of the session. So as not to be shorter march of the Olympic torch. " (Copyright © Jelsoft Enterprises Limited 2000)

2-1-10 Olympic stamps: Founded the International Federation Olympic, for philatelists Olympics in 1982, at the suggestion of the Marquis Spanish "Juan Antonio Samaranch," the President of the International Olympic Committee then (1981 - 2001 m), a philatelic. In the "Athens in 1896", contributed sales of commemorative stamps, the expenses of preparing the session, with proceeds 400,000 thousand Greek drachmas. Many of the athletes and leaders of the international Olympic Movement immortalized stamps. In the session "Anfrs in 1920," Belgium has issued stamps Olympic group, after it was exclusive to Greece. In issued in 1937 Greece Group of historical stamps Greek Olympic sport; to honor the "Diajuras," the island "Rhodes." The nature of the first Olympic carrying the image of the founder "Coubertin," published in "Haiti" in 1939 two years after his death. And Iraq issued a series where the image of Olympic stamps quarters of the deceased (Abdul Wahid Aziz) marking the winning bronze in weightlifting tournament in light-weight at the Rome Olympics in 1960 . On the Tokyo in 1964, Egypt issued the first set of Olympic stamps, as well as in the two sessions of "Los Angeles in 1984" and "Mexico in 1986." At the Munich Games in 1972, the Principality of "details" and accessories, a group of Olympic stamps. As the Principality "Umm Al Quwain" set stamps on the Olympic history, the Olympic posters. In the "Sydney 2000", the Australian Department of Post, on its image printing any Australian player, win the gold medal in 24 hours made for the gold medal.

2-1-10Olympic commemorative currencies:

Knew his first Olympics in 480 BC. M, and was category four drachmas, struck by order of Governor of the territory of Sicily "Anakzilus" Anxious. Commemoration of victory in a race war wagons. In the modern era of the Olympic Games, Olympics and his first emerged in the "Helsinki in 1952" in Finland, and in Moscow in 1980 and Seoul in 1988 and in the "Atlanta" in 1996, the interest minting of America, in support of the U.S. Olympic Committee, sports teams and the capacity of 21.3 million dollars "Proceeds from the sale of Olympic commemorative currency.

Recalled that Finland was the first issued currencies Olympic commemorative precious metal when it hosted the Olympic Games-15 in

2-1 - 12 Olympic medals: In the modern age of Olympic cycles, the medals were awarded prizes for the winners, medals and witnessed great development during the long journey that began in 1896, were awarded to winners in each race only at the beginning, and was crowned the first winner of the silver medal castings crowned of olive branches, either It was the second winner will be coronation medal and bronze wreaths of Laurel. With the passing of days, the number three medals, one gold, and grant the first place, and the second silver granted to the second place, third and the bronze awarded to the third place, sometimes the number of medals in the competition one more than three medals when players are equal to what the outcome. The Olympic medal is thinner than (3 mg and weighing nearly 135 kilograms, and the gold medal, made of silver, including at least 925 carats, painting, including at least 6 grams of pure gold, while the silver medal, made of pure silver, 925 carats, the bronze medal, made of metal alloy. The Olympic medal for several designs at the outset, was conceived Mythology themes, and some symbols of the Olympic sports, and olive wreaths, and then slogans nobility of the city hosting the session. In the "cycle of Amsterdam" in the Netherlands in 1928, was a decree on one side of the Olympic medal, "Nike" a victory when the Greeks, a Rafie "olive wreaths" his right hand, in the lower part details "Alkoliziom" in ancient Rome, has written on the Edge Higher No session of the Olympic medal, and place the language of the city, the design of the Italian artist "Joesp Cazioli," The design of this show on my face even medal in 1968.

In the course of Rome in 1960, decided to suspend medal in the Sash or series. Beginning in 1968, it became the right of the Organizing Committee for the Olympic cycle, the design of the back of the medal, after approval by the International Olympic Committee in the design cycle Atlanta in 1996, the design of the centennial medals includes the same elements that were in the previous medals (a woman wearing ministries and put a wreath Of olive branches over her head, her hands and carrying a bundle of twigs, and there is a cart pulled horses and the image of an ancient Greek Olympic Stadium, as well as seminars Olympic year history of carrying the Olympic and No. "cent". On the flip side there was a mix of Olympic Games logo with 31 planning Symbolizes every one of a certain Olympic event. In the "Sydney 2000", broke out a broad argument in Australia; mistaken for the design of Olympic medals, because it contains "Alkoliziom" (included Roman) instead of the Greek temple, said the newspaper "Okosmos" published in Greek in Australia medal design "that involves Ignorance is applied." He said: "George Hadjiyvasilys" chief editor of the newspaper: "Alkoleezzoyom" or "on the Romanian" spilled blood on its walls, a far cry from the Olympic ideals of peace and brotherhood. "Organizers gave the session, the blame at the International Olympic Committee, saying:" They objected to a plan to design the Opera House in Sydney on medals, and ordered instead to develop the design "of Coliseum year." As the backdrop for Olympic medals.(Http://www2.lhric.org/pocantico/olympics/olympics.htm)

2-1-13 Olympic Arts and Literature:

"The objective of mixing sport with the arts in the Olympics; was to review the excellence and superiority among human beings, as well as to take advantage of the meeting of minds and muscles and Greeks had the slogan" Healthy Mind, Healthy Body. "Hence the comparison between Plato in the Republic of art and literature on one hand and between sport And physical education from the other hand, in the first path to beauty spirit, and in the other the means to beauty body. Defines rights and the Olympic ideal as a template to track the evolution of human personality, mind and spirit. We note that Greek art has manifested in the construction industry temples and the beautiful statues, is the statue of "Zeus" great Olympic gods of the seven wonders of the world, and my Greeks sports arena, briefed columns suitable for sporting purposes, and sanitary conditions, and added that the columns on sports arenas elegance, and reflected glory In Rehab particularly in the spread of the sun. Olympia has not been earmarked for sports, but was like a market where Arabs Oaks, which held sessions on the sidelines of various types of arts such as poetry and rhetoric and industry statues and succession. The approach geniuses of thought and Greek art, and there is the story of the heroic "Pitas" clarify some of the arts and literature, which was held on the sidelines of the Olympic festival, has asked the Friends of Olympic champion "Pitas" poet famous song")(Pindar," to organize a poem of the hero "Pitas" On the occasion His victory and asked them to " Pindar " sum of money, grandest his Friends of the star, they said we can evaluate him a statue of copper less than this, but after consultation and found that the poem is better than the statue, paid for a poet Pindar amount requested, systems them first was a poem: You do not Statues makers not only seen as focus .. But I notice organized fly in prospects.. The flies with reputation "Pitas" successful corona nail. Whitney from the foregoing that the Greeks who appreciate poetry and poets; poet and built for the Olympics " (Pindar (520 BC. M 440 BC. M), a statue is still alive, is the most important poem, " Pindar," a poem XIII Olympiad Provided to Olympic champion "Akznobon." When rebelled good judgement ** Alexander the Great (336 BC. M 323 BC. M), destroyed the tale did not leave the house only a poet and Bhandare temple. In modern times Coubertin thought that accompany sports competitions, the dumping of poetic couplets, the unifying vision of human energies, and in 1906, Coubertin proposed that includes the Olympic program at various competitions in the arts. In 1912, held the first contest for the arts, and in 1952 turned into performances only, and my

head of the Olympic Committee "EVRY)(Pindar " (1952 1972 m), fine arts in the Olympic program. The protocol contains the Olympics organizing a core programmer of arts, include Article X It contests for the arts. Olympic Committee has been notified of the Arts in 1992 and based in Paris. " (http://en.wikipedia.org/wiki/History_of_the_Modern_ Olympics)

2-1-14 decrees ceremonial and include the following:

A. Opening ceremony: Begins Olympic opening ceremony of the session, the arrival of head of state often or sometimes on behalf of the Olympic stadium. It would be received at the entrance to the Olympic stadium, President of the International Olympic Committee, and Chairman of the Organizing Committee for the session. The Head of State is heading to the podium of honor with him and his entourage. The music playing the national anthem, after the anthem, flying the flags of participating States at the gates of the stadium, and starts a column display of the States participating in the session, each team is uniformed and file each team a banner bearing the name of the state, and national flag and the state of Greece came to the fore in her honor, when the Is another session would be organized teams and moving the rest of the States participating in the Olympics behind Greece depending on the arrangement mill epidemic of the State Organization and the State Organization comes in the back row presentation, and all the flags of States participating in the Olympics, when in front of the podium with President degeneration tribute to the officials - except "Saudi flag" No Linux; because it bears the slogan unification "No God but Allah Muhammad Messenger of God." After each team to complete the stadium in its stand in line behind the sign holder and holder of the flag in front pad head of state, like Chairman of the Organizing Committee, accompanied by Chairman of the International Olympic Committee set up to the podium in front of exclusive honor. The Chairman of the Organizing Committee President of the International Olympic Committee a few words, asking him to submit to the Head of State or rotate it, please open the session. And then ascends the International Olympic Committee President to the podium after a brief welcome speech, calling the Head of State to the Olympic opening of the session. At that moment, the Olympic flag rise slowly even if the summit arrived in force, launched a squadron of the carrier pigeon, and in every way bar pigeon Olympic flag. And then playing music and cannons fired three shots, and climb the mayor of the city and its vicinity head the International Olympic Committee, comes delegate city that organized the previous session, and provides science tiles "Sato music", the President of the International Olympic Committee, which in turn submit it to the governor and preserves this science in the building Municipal to the next session. There are tow flags one of the summer Olympic cycle, and the other for the Olympic Games. Comes another player or player or two with us carrying the Olympic flame, just around the Olympic stadium, and then moving towards the torch has been permanent, and remains not extinguished the flame alive only in the closing ceremony, and make a joyful media campaign in the form of half circle, and during the passage of information campaign Podium in front of the President, they must Gorge media, and then went after the same order in which teams entered, and leave the Head of State position . And thus ends the opening ceremony.

B. Crowning the winners: Players who take the three places on the first rank, uniformed sports over a runway, which was developed exclusively against honor, standing in the first place in the degree rise slightly in the middle class by the second position and be at the right of first place wins, and take the third place on the left His first place.

C. Closing ceremony: Closing ceremony will be held at the Olympic stadium, following the end of the last competition, namely "marathon", and moving information campaign teams participating in the stadium behind their own banners holders, and take the order on the opening day itself, in midfield and go all the athletes in one column and collectively, rather than Each mission is single nation without universal adherence to sexually melted in a row, and this was the idea of Chinese boy "John Ian Wing," which was at the age of seventeen years, he was working carpenter trainees in Chinatown in Melbourne, Australia, when he sent a letter to "Wilfred I Hughes "Chairman of the Organizing Committee of the Melbourne in 1956, suggesting by this idea, and implemented the idea immediately, and called the session" Olympics friendship." The meeting ends on the platform of honor in front of athletes, raising the Olympic flag to force the Yemeni used in the opening ceremony, and raises the flag of a State Organizing Committee for the Games to force Central at the same time as it plays the national anthem and raising the flag state that will be established by the next session to force the left with The national anthem was played. Then climb the International Olympic Committee President to the podium and announce the conclusion of the Olympics. At the end of the ceremony extinguished the Olympic flame and the Olympic reluctant peace, at the same time get the Olympic flag bit of force, and holding it horizontally group of eight people wearing a uniform, five guns and fired shots, and then singing, choir, and leave the stadium leaders, and media campaign, and athletes to the music Music. ttp://www.instructorweb.com/lesson/olympics.asp)

3 - Action research:

3-1 Curriculum research:

the historical approach was used to dictate the nature of the current study. "Interested in this method to collect facts and information through the study of documents, records and effects, and is used in the study of phenomena, events and attitudes which has a long or short time. And the sense that this method of research

is Studying the past, events and thus could not control the variables as is the case in empirical research.
Frenkle & Wallen: 1993, 316)
3-2 Research tools: Analysis method was used to the sources of scientific content analysis and content "is a distinctive research methods to provide quantitative indicators and objective guidance on the values and standards and the advantage of adopting the field study, documents and official statistics and various media to reach the actual attitudes or opinions of people interested in this way or that without any Personal bias or interference by the researcher, used this approach in research, policy and media personality, anthropology, sociology and management science. "(Obeidat: 1999, 49)

4 - Presentation and discussion of the results:

4-1 philosophy of the Olympic symbols:

Whatever the symbol takes place in contemporary studies of cash, and almost did not find the philosophical study does not include a chapter or more on the symbols. The reason for that is - primarily due to increased indicative symbols, language and objectives of the modern era. And privileged to attend it. In order to determine the significance of the terminology code (signal a banner) we say: Symbol word, or phrase, or image, or personal, or the name of the place contains within more than one sign, including the polar linking major. The first is the apparent dimension of the symbol, which is received directly from the senses, is the second dimension subcontractors or dimension beyond understanding exegesis only through symbol. There is a strong relationship between the visible symbol and the subsoil.

Linked to levels of use of the symbol, and deal with him, as well as to suggest strength and representation, the development of creative awareness, and its ability to abstract. The allegation that the symbol in its infancy did not refer to anything beyond (what), whether expressed by suggesting or sound or movement or any other form.

These first attempts to shed some light on the world of Olympic symbols and sports also shown us will see in parts of this research, new indications regarding the nature of the world of symbols and thus human nature itself. King human being symbolic of the stock to cover the enormous human nature. This means that the world of symbols and functions are not confined to the limited functions offered by these symbols of the Olympic athletes in certain courses. But beyond the functions of nature is absolutely not abide by the limits of time and place advantage. Human thought, for example, writes him immortality is certainly of this kind. The study of these aspects of the hidden world of symbols remained marginalized in some of Humanities and Social Sciences, which is expected not surprising in it.

1 - Philosophical concepts of the Olympic flag: The choice of flags and symbols Spars are striking for all, a unique combination of elegance and strength and simplicity. And because human beings dwell in venerating these symbols, the flags and Spars focused mostly in the most beautiful locations where the sight of the largest possible number of people.

"I saw first, regardless of the color of cloth and endured images, symbols and slogans, they serve as an umbrella symbol revolves around his friends, who are often the owners of one case in particular in the battle" (Thames &Hudson; 1972, 19). The five rings of different colors reflects the continents of the planet is composed of expression in workshops or services without other geometric shapes, perhaps for connections first, then the depth of expression and potential written diverse. It is for the Chamber geometric form that knows no end, because everything else with the angles the sharp angles or sharp ridges end. Revolving if the best expression of continuity, survival and longevity, completeness and containment, without bias to a point on the ocean, or in the dimension of the Centre from any side of the Pacific is the symbol of god to get the words reflect the synchronization and harmony and unity College, and supplements And advice and eternal Interminableness.

2 - The philosophical concepts of the Olympic opening: Olympic life seeking to exchange and integrate different cultures, and the fact that the Olympic Games and the Olympics both Festival activity aimed at achieving the exchange and integration of cultures in the world of sports At the same time is suitable joint benchmark for real dialogue and exchange between different nations of the world. Inaugural manufactured succeeding generations in every city In a world cultural heritage bears the personal stamp of their city, which show the effects of belief, culture, customs and traditions, whether such a purely intellectual heritage bid; literature, philosophy and other humanities, or tender material produced by science and action; such as architecture, appliances and machinery, tools and means of livelihood war, and So. To the extent that generations in this city active and vital are a rich and diverse heritage, as far as the interweaving relationships with others, their experiences are wide, and accused the bid significantly. Researcher believes that during the successive eras of life lately performed in various cities around the world; Greece, Rome and Carthage, Alexandria, Mesopotamia And other cities in the ancient world, where generations manufactured during the period of glory shine keepers have history, and each city of those cities in the glory that discriminate created, and the specificity of the heritage left by, as though the glory of Greece in poetry, theatre, philosophy and the Olympic Games and was the glory of Rome Military firm and the luxurious necessities of life, and the glory of Alexandria in vaginal luxury intellectual and philosophy schools, sports grounds and Ruffian in writing, and many others.

3 - philosophical concepts of the Olympic postage stamps: Olympic stamps that tell how civilized development witnessed in the Olympics, and these stamps - Telling the era of Olympic history, and really

reflect on the sense of cultural and literary enjoyed by the perpetrators of such idea, and telling about the history of the Olympic Games. The researcher believed that the wealth of Olympic stamps deserve great civilization preserved and documented in specialized centers, as recorded Olympic history, and explains a lot of shifts and changes undergone by the Olympic Games in the march of peoples lives.

The importance of postage stamps is that they link between peoples of different countries, therefore, whatever helped distances, including the means of communication with them has become easier through providing postal services between these countries and less expensive than other means of communication available. Through the presentation of the philosophical concepts of some symbols Olympic researcher believes that the issue of Olympic symbols civilized basically they arise and evolve in the city cultural integration of society Urbanite, and that is the essence of any thinking and what the Olympic symbols is to discuss strength and nature of social, philosophical, aesthetic and Vinominologer also apparent .. Despite the link Palmtheologia Greek Olympics and religious rituals of various ancient communities, but it was still reflect on the visual perceptions and the intellectual, philosophical and social problems for the people. Before the emergence of philosophy, a myth that was capable of interpreting the world and the universe, the philosophical foundations of the civilizations of Greece and the Mediterranean civilizations, the Nile Valley and Mesopotamia and other civilizations possess yards cities and temples, primitive ritual and religious texts legendary tragic. And through that we can discover a lot of philosophical concepts, religious and aesthetic that combined social life and then having its supply and its implications in our modern, dynamic, which confirms the ability of totalitarian excesses of the troublemaker of a man's mind ancient civilizations, which was adopted question method for interpreting phenomena. The question of knowledge leading to the start of accumulated knowledge and civilization, eyebrows broke the dimension of this art legend But why is critical and that led to the evolution of the Olympic symbols is what happened in terms of Greek social life created democratic practice in the old ethnic community internally developed enormously. Since then became the celebrations which were held in Greece, one of the expressions of distinct ethnic democracy, and enriched its evolution.

5 - Conclusions and Recommendations:

5-1 conclusions:

1 - invested Olympic Games uses modern technology in communications, economic, political and cultural between the peoples of the world significantly.

2 - The Olympic Games are not a major festival for athletes but also for volunteers and volunteer corps of vital activity, competence and qualifications of the conditions of the success of hosting the Olympics.

3 - Olympic Games contribute to the development and growth of young people by instilling the following concepts:

First: "The concept of responsibility." Voluntary Service through its objectives of the successful host city in the Olympics, strengthens their sense of mission and responsibility, and promotes the national spirit and the spirit of honesty and self-reliance. And a broader II: "The concept of self-confidence." The hosting of any city of the Olympic Games evidence of long-term evolution of the country gives young people the opportunity to directly sense the great achievements that are a source of pride by highlighting civilization and ancient traditions and ethics. Third: "The concept of learning." For the provision of quality services, we must know everything that is the Olympics of culture and knowledge of the city, learning techniques and services. Fourth: "The concept of openness to the outside." Olympic Games as a means of cultural exchange and develop competitive sports Chime open heart, openness and the ability to exchange equal and awareness of fair competition. V: "The concept of cooperation." They can learn through exercises and work realism special services volunteer to cooperate with others and learn teamwork achievement.

5-2 recommendations:

1 - establishing the principles of the Olympics moral, intellectual and philosophical.

2 - the contributions of diverse cultures in establishing the Olympic Games, is must not only Greek cultures, the domination of European cultures and this must introduce Islamic cultures, Indian, Chinese and many others because they have all cultures by providing them with the Olympics.

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DETERMINATION OF SMOKING HABITS OF PHYSICAL EDUCATION AND SPORTS STUDENTS WHO ARE ACTIVELY DOING SPORTS

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ABSTRACT

For example, in Turkey 133 (% 50.9) of individuals for the first time at the age of 11 and , %13.6 in the previous years at the age of 12 meet to smoke (Yazıcı and Ak, 2006).

Objective

The aim of this study is to determinate the smoking habits of physical education and sports students who are actively doing sports.

Research methods and procedures

Smoking habit is very common in our country. The work group of study which is an identifying species consisted of 112 university students who play football actively and study at the department of Physical Education and Sports Academy at Karamanoğlu Mehmetbey University.

Results

İt has been determined that students'smoking starting age average is 17.53±2.04,and has been smoking for 4.68±1.63 in this study. It has been determined that % 58 of students who participate in the study have the smoking story and %60 of the students is still smoking actively.

Discussion and conclusions

İt is known that many sports men start smoking in early ages.young people should be prevented from accessing to tobacco,protected from advertising and promotion and these people need to be supported about struggling to give up smoking habits and need to be acquainted about bad habits about smoking.

Key words: University Students, Cigarette Data Level,Doing Sports Actively.

Introduction

Throughout history, people have used harmful substances to enjoy and get clear of distress, excitement, pain and sorrow. These substances have made a person habit and addictive in times. Impaired physical and psychological health of people, important social problems emerged. People have to protect themselves and their environment from these substances. Cigarette habit of society is an important public health issue that concerns all of the people (Herken ve ark., 2000).

According to world health organization data, it is konown that in 1990 early, each year 3 million people died because of the smoking, but today all over the world, each year 1.5 million in developing countries, totally 4.5 million people and in Turkey 70-100 thousand people lose their life because of connected to the smoke reasons . According to estimates, it has been reported that in 2030, each year 7 million people (70%) in developing countries,totally 10 million people will lose their lives because of reasons depending on the cigarettes (Karatay an Kubilay, 2004).

Nowadays, cigarettes are in the first place among used addictive substances in the world. Cigarette habit often starts in the adolescent period. 300 million young people in the world is dependent on cigarettes, and one of every five cigarette users is

between the ages of 13-15 (Taşçı et al., 2005). In general, in the period of adolescence, age of the beginning to this habit declines until the age of the childhood period. For example, in Turkey 133 (% 50.9) of individuals for the first time at the age of 11 and , %13.6 in the previous years at the age of 12 meet to smoke. (Yazıcı and Ak, 2006).

Smoking habit is very common in our country. According to a research made in 1988 and representing the whole country, 15 years and over 62.8% of men, 24.3% of women, and 43.6% of all population smoke cigarettes.(Taşçı et al., 2005). In this study , smoking habits as a measure "to carry the cigarette package" has been taken; but according to the DSÖ assessment, the smoker to be considered "regular smokers per day to 1" is sufficient (Printer and Ak, 2006) .

Therefore, probably the habit of smoking is even higher than the assets. (Goldberg et al, 1993). Young people towards smoking the risk factors; they are specified as smoking, drinking close friends, parents, siblings or teachers to have a low socioeconomic level, more attractive and modern look for the mistake, depression and anxiety to resolve the path, low school achievement and male gender (Kutlu & Çivi , 2006).

Our country for cigarette consumption is in the third ranked among European countries,is in the seventh ranked among the world countries(Ministry of Health Research). In 1988,the smoking prevalence in men 62.8%, women 24.3%, 43.6% in the population over age 35 in the piar survey carried out on a sample group which will represent all Turkey have been identified (PİAR).

Risk factors for youth to head smoking;are indicated as parents, siblings or teachers ,best friends who smoke,to have a low socioeconomic level,misconceptions of appearing more attractive and modern,depression and anxiety reduction path,low school performance and male gender (Kutlu and Çivi, 2006). The aim of the study in light of all this information; is to determinate the smoking habits of physical education and sports students who are actively doing sports.

Methodology

Type and location of the survey: Working group of survey which is descriptive type has been made in the Physical Education and Sports School at Karamanoğlu Mehmetbey University in 2008-2009 academic year in the spring semester.

Working group of the study: The basis of the study has formed 112 university students who agree to participate in the study,are doing sports actively and are studying in the 1st, 2nd, 3rd and 4th in the Physical Education and Sports School at Karamanoğlu Mehmetbey University.

Data collection methods and tools: Datas 2008-2009 academic year spring - term were gathered by with survey method including students' socio-domographic features and smoking cigarette cases and by based on self-report in classroom environment. In sociodemographic characteristics; such as age, where the family lives,which class he or she is studying, parental educational status, father's occupation, family income level and number of siblings questions were asked , in the form which is questioning smoking cases ; such as anyone's smoking status in the family, smoking status, if smoking, starting age to smoke, how long he/she has been smoking, what the reason of starting smoking is, how many cigarettes he/she smokes in a day, what the reason of stil smoking is, and whether or not he/she gives up smoking of questions were asked.Verilerin Analizi: Verilerin analizinde sayı yüzde dağılımları ve t testi kullanılmıştır. Verilerin değerlendirilmesinde SPSS 13.0 programından yararlanılmıştır.

Limitation of the study

1. Karamanoğlu Mehmet Bey University,physical education and sports college students are limited.

2. It is limited with students doing sport actively.

Findings

Students' age average who participate in the study is 22.16±1.49, %6.3 of the students in the 1st class, %24.1 of the students in the 2st class, %42.4 of the students in the 3st class and %26.8 of the students in the 4rt class are studying .%8 of students lives in the village, %20.5 of students lives in the town and %71.4 of students lives in the city .students' family income avarage is 1490.63±62.27, % 45.6 of their mothers literate / primary school graduates and % 54.4 the secondary school graduates and above , % 28.6 of their fathers literate / primary school graduates,and also % 71.4 of their fathers secondary school graduates have been found. İt has been determined that students'smoking starting age average is 17.53±2.04,and has been smoking for 4.68±1.63 in this study.

Table 1. Students Smoking Cigarette Distribution (n = 112)

	Number	%
Properties		
smoking in the family		
Yes	65	58.0
No	47	42.0
Smoking		
Yes	60	53.6
No	52	46.4

It has been determined that % 58 of students who participate in the study have the smoking story and %60 of the students is still smoking actively(Table 1).

The students' starting to smoke age average who smoke cigarettes is 17.53±2.04 ,it has been identified that they have been smoking for 4.68±1.63 years.

Table 2. Students Smoking Cigarette Distribution

Start Smoking Reasons	**n**	**%**
Curiosity	6	10.0
Affectation	5	8.3
Sadness,stres	16	26.7
Friends environmental impact	25	41.7
Family environmental impact	8	13.3
To look more mature	-	-
Continue to smoke	**n**	**%**
To disperse distress	23	38.3
Not to be alone	-	-
Not putting on weigh	3	5.0
To prove independence	-	-
Recreational effects	34	56.7
To increase attention	-	-

The students daily smoking number has been identified as average14±4. While % 14.3 of students who are smoking because of harmful for our health and % 2.7 of students because of being afraid of being ill indicate to think of giving up smoking,%16.1 of students to get over stres,%12.5 of students to love smoking and %8 of students not to see any harmful side of smoking indicated not to think of givin up smoking.who smoke cigarettes expressed that it was dangerous for their healthy while % 2.7 of students are not thinking of determining to give up smoking because of scare of being ill in the future , (n=41) % 16.1 of them

Discussion and results

Among sudden deaths in sport in the first ranges are illness depending on smoking. Intensive training and smoking can bring up vital results. (Boraita, 2002).

Ages of starting smoking between 15-19 year-old were found in studies making Yıldırım's in Manisa, Kutlu's and Nail's in Konya, Altintas's in Ankara (Altintas et al 2006; Kutlu and Çivi 2006; Yildirim et al 2004). It was found that people had largely started to smoke between 16 and 20 years old in also Bilir's,Ogel's and Demirel's studies(Bilir et al 1997; Demirel et al, 2004). The average age of starting smoking was found to be 19.63 ± 4:25 in Önsöz and his friends' running the studies with smokers who were admitted to Marmara University aculty hospital of Medicine for any reason (Onsoz et al, 2009).İt has been determined that students'smoking starting age average is 17.53±2.04,and has been smoking for 4.68±1.63 in this study. Age of starting smoking in our study is similar to the literature. Adolescence is a period of increased risk behavior. Smoking during this period is one of common risk behaviors (Feijó and Oliveira 2001).

İt has been determined that 58% of students who participated in the study have smoking experinced and %60 of students is still smoking cigarettes actively. The age of smoking is getting smaller İn many developed countries. Because of that, the risk of development of various diseases increases depending on smoking on the early years (Goldberg et al 1993; Icle and et al 1992). This means that youngs who develop illness depending on smoking continuously will need to get treatment for a long time and will

increase the cost of smoking related diseases (Haustein, 2006). Again it has been determined that 58% of students who have smoking people in their family and %60 of students is still smoking cigarettes actively. İt has been determined that friends environment is among starting smoking reasons in the first range (41.7),sadness/stres is in the second range (%26.7),family environment is in the third range(%13.3) and curiosity is in the last period (%10.0).Students should be very careful to choose friends in high school and university,if parents are more sensitive and careful for this subject ,they may prevent from getting bad habits. Students should be required to be tought about the negatives effects of smoking. even if people who are especially models for young people in society (such as artists, athletes ...) smoke cigarettes,they should not smoke in front of society encouranging young people. Even if parents smoke cigarette,they absolutely must not use tobacco next to the children in the house . It has been found that people should need to be given information smoking and harmfull effects.

İt is known that many sports men start smoking in early ages.young people should be prevented from accessing to tobacco,protected from advertising and promotion and these people need to be supported about struggling to give up smoking habits and need to be acquainted about bad habits about smoking.

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THE DETERMINATION OF THE PHYSICAL EDUCATION AND SPORTS ACADEMY STUDENTS' INFORMATION,OPINIONS AND THOUGHTS ABOUT USING DOPING WHO ARE INTERESTED IN FOOTBALL AND SPORTS DIVITION

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ABSTRACT

Doping is defined as Sportsmen during the competitions with the aim of increasing physical and mental performance prohibited by "International Olympic Committee (IOC) or used substances or methods by sportsman consciously or unconsciously.

Objective

This study is planned for the aim of determining of the physical education and sports academy students' information, opinions and thoughts about using doping who are interested in football and sports division.

Research methods and procedures

The identification study was made at Karamanoğlu Mehmetbey University at fall term in 2008-2009 education-training year100 university students who agree to participate in study, are interested in football and sports division and study in 1st, 2nd, 3rd and 4th class of Physical Education And Sports Academy at Karamanoğlu Mehmetbey University and Selcuk University, composed the creation of study.

Results

% 18 of the students is girls and % 82 of the students is boys having participated in the study. Students' age average is 21.83±1.62, and % 67 of the students study at Karamanoğlu Mehmetbey University and % 33 of the students study at Selcuk University and the department of physical education and sports.

Discussion and conclusions

When students' opinions and ideas are examined about using of doping of students in football industry, it was found 19 % of students have no enough information about doping. 23 % of the students have expressed the most stimulating substances used in the sports. While 85 % of the students express that doping means that a substance hazardous to health when,% 49 narcotic analgesic is used most in sports, and % 21 the most in sports is used to express Anabolic steroids have androgenic. It should be noted that the easy and healthy way to improve performance, and regular and proper training, adequate rest, proper motivated violence, adequate and balanced diet and sports activity is the scientific approach in all stages.

Key words: Football, University Students, Doping.

Introduction

Sports which is a communication and information age today, is an activity for people to have a good time and to maintain a healthy life, and also it is an activity for some people to make it profession by taking time and to get the financial earnings. It is inevitable for sports that has a broad audience and makes financial gain by adding (Karahan 2002).Therefore, sportsmen beyond win the performances with the training, have directed to use some matters, materials and some applications which affect the result of the game in sports competitions which are major goals to win (Kurdak, 1996).

Doping is defined as Sportsmen during the competitions with the aim of increasing physical and mental performance prohibited by "International Olympic Committee (IOC) or used substances or methods by sportsman consciously or unconsciously. Doping both prepares ground for unfair competition, and discomposes health of sportsmen as a short and long term and even is against sports ethics due to the cause of the possible risk of death. For these reasons, WADA doping prohibited by the international sports organizations such as International Olympic Committee (IOC), FIFA, UEFA, Fiba, IAAF (WADA, 2002).

Almost all of doping substances cause short or long term side effects in the body. It is known that especially like male sex hormone substances which are mostly used by sportsmen cause such as the heart of the crisis, the good and bad-tempered tumor formation, liver dysfunction, infertility illnesses. Some of the athletes who use these substances are known to have died during the sport of life or after leaving the sport because of the use of these substances because of diseases (DiCecco, 2002; Strauss, 1987). Many athletes can try to improve their performance to achieve more than get from their own efforts (Steben and Bourdeux, 1972).

Therefore, dietary contributions which improve work performance and ergojenik supports or making a research for materials are as old as sport itself (Straus, 1985; Williams, 1992). It has been known for BC 500-400 years Such as deer liver and the lion heart, some parts were consumed by athletes and warriors in the hope of the courage, speed or giving the energy (Straus, 1985;Williams, 1992). It is accepted that emerging negativeness depending on using doping is known by athletes (Farnaz 1998).

However, Insisted on using doping is thought to be the irresistible charm, attraction of the records and victories, getting trade of sports more and more and increasing a tight relationship between doping and professionalism step by step. Interest and motivation against doping emerge as one another factor caused by social and economic rewards, increasing of the sport every day and not comparable with nothing. while footballers' team level and uniform of love are making them successful in sports,their lack of knowledge and laziness of training or preparing for a competition, going into the quest for variety to achieve success of athletes more quickly cause increasing the interest of the doping (Hıncal & Dalkara 1991). This study is planed for the aim of determining of the physical education and sports academy students' information, opinions and thoughts about using doping who are interested in football and sports division.

Methodology

Type and location of the survey: The identification study was made at Karamanoğlu Mehmetbey University at fall term in 2008-2009 education-training year.

Working group of the study: 100 university students who agree to participate in study, are interested in football and sports divition and study in 1st, 2nd, 3rd and 4th class of Physical Education And Sports Academy at Karamanoğlu Mehmetbey University and Selcuk University, composed the creation of study.

Data collection methods and tools: Study data was gathered by survey method that leant against self-declaration of participants. In the survey form some questions which are specific to interrogation of socio-demographic features;_age, sex, studying university, how many years they do sports, who effectively directs them to do the sports a knowledge form which is leant against measuring knowledge level about doping were asked about using doping and questions to the students.

Data Analysis: The number percentage distribution and t-test were used in the data analysis. Evaluation of data was made use of SPSS 13.0 programme.

Limitation of the study

1. Karamanoğlu Mehmetbey University, physical education and sports college students are limited.
2. With people doing sports actively is limited.
3. With students being interested in branch of football is limited.

Findings

University students' socio-demographic properties who are doing actively sports and are interested in branch of football sports are researched below.

Table 1. Students' socio demographic properties' distribution

Properties	**AV./SD**	
Age	21.83±1.62	
	n	**%**
Sex		
Girl	19	19
Boy	81	81
University		
Karamanoğlu Mehmetbey University	67	67
Selcuk University	33	33
Sports doing status		
1-3 year	27	27
4-7 year	35	35
8-11 year	15	15
12-15 year	23	23
The reason of ling.dative		
With his or her own wish	62	62
With his or her friend	13	13
Media	7	7
Phsical Education Teacher or trainer	18	18

% 18 of the students are girls and % 82 of the students are boys having participated in the study. Students' age average is 21.83±1.62, and % 67 of the students study at Karamanoğlu Mehmetbey University and % 33 of the students study at Selcuk University and the department of physical education and sports. It has found that % 27 of the students has done sport for 1-3 years, % 35 of them for 4–7 years, % 15 of them for 7–11 years and % 23 of them for 12–15 years. And they have indicated that students' tends to the sport is via % 62 by own attention, % 13 intervention of family and friends, % 7 media and % 18 the physical education teacher and trainer (Table 1).

Table 2. The distribution of Students' knowledge,opinions and ideas about using the doping.

QUESTIONS	Yes		Partially		No		Overall
	n	%	n	%	n	%	
Do you have enough information about doping?	19	19	24	24	57	57	100
The stimulative things are mostly used.	23	23	27	27	50	50	100
Is Doping harmful to health?	85	85	12	12	3	3	100
Narcotic analgesics are mostly used in sports.	49	49	28	28	23	23	100
Anabolic androjenik steroids are mostly used in sports	21	21	65	65	14	14	100

When students' opinions and ideas are examined about using of doping of students in football industry , it was found 19 % of students have no enough information about doping. 23 % of the students have expressed the most stimulating substances used in the sport . While 85 % of the students express that doping means that a substance hazardous to health when,% 49 narcotic analgesic is used most in sports, and % 21 the most in sports is used to express Anabolic steroids have androjenik (Table 2).

Discussion and results

When our research results are explored, while the proportion of students who are interested in branch of football and are doing sports, saying that we have enough knowledge about using doping was found % 19, the proportion of students saying that we don't have enough knowledge about doping was found % 57. While the proportion of students saying that it is the most using stimulants at sports was found %23, the proportion of students saying that it is not the most using stimulants at sports was found %50. While the proportion of students thinking that doping is harmful was found % 85, the proportion of students thinking that doping is not harmful was found % 3. While the proportion of students saying that it is the most using narcotic analgesics was found % 49, the proportion of students saying that it is not the most using narcotic analgesics was found % 23. While the proportion of students saying that it is the most using anabolic androgenic steroids at sports was found % 21, the proportion of students saying that it is not the most using narcotic analgesics at sports was found % 14.

It was determined that students, who are interested in branch of football and are doing sports actively, have no enough knowledge about doping in our research . % 83 of the students who participated in the research saying that doping is insanitary is a positive result. Stimulants are used to increase the performance at sports. Increasings % 0.6-1.2 at swimmers and % 1.5 at runners, increasing % 3-4 performance with the using of amphetamine (stimulant) at footballers in a study done were taken notes (Ariens 1965). Trainers, physical education teachers, sports managers and federational athletes should be absolutely informed about doping, observed the athletes' performance changes well and should be prevented from getting in the habit and neediness. Yıldırım (2001) compared with doping using inclinations between amateur and professional footballers. It was found that using doping was not common inclination and not becoming different between amateur and professional footballers meaningfully in his study. Consequently, he found that footballers' doping using levels were not enough.

It should be noted that the easy and healthy way to improve performance, and regular and proper training, adequate rest, proper motivated violence, adequate and balanced diet and sports activity is the scientific approach in all stages.

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THE COMPARISON OF URINE ZINC VALUES OF FOOTBALLERS IN THE INDUSTRIAL REGION AND OUTSIDE THE INDUSTRIAL REGION

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ABSTRACT

The aim of this study is to examine urine-zinc values of footballers living and doing training in industrial region and footballers living and doing training outside industrial region.

In the research,14 amateur footballers , whose age-average is 24,00 ± 3,46 year, height-average is 1,76 ± 0,05 meters, body weight average is 70,79 ± 6,70 kg and sports-age average is 11,71 ± 3,49 year and who do training in industrial region and 10 amateur footballers , whose age-average is 20,40 ± 0,84 year, height-average is 1,75 ± 0,07 m, body weight average is 69,70 ± 7,81 kg, sports-age average is 6,50 ± 1,84 year and who do training outside industrial region , were participated voluntarily.

One tube of urine specimen was taken from the footballers participated in the research. The urine specimen taken was analyzed in Biochemistry laboratories through Anodic Stripping Voltammetry (ASV).

A statistical difference has been determined between zinc values of footballers participated in the research considering their doing training in industrial region and outside industrial region. ($P<0,05$).The zinc values of footballers living and doing training in industrial region have been found to be higher than the zinc values of footballers living and doing training outside industrial region in the research.

To conclude, it is thought that the trace elements in human body are affected by working and living environment and as well, it can be said that this situation should be taken into account by the trainers.

Key words: industrial region, zinc, footballer.

INTRODUCTION

Many minerals considered as essential (materials that body can't produce and should be taken from outside) are necessary for organism's doing its function healthily (B.L.Vallee, K.H.Falchuk, ,1993). Although zinc, being one of these elements, ranks number 23 considering the position of being on earth, it is commonly used in biology. So indeed, zinc is the only metal being in each enzyme class. As a natural result of this, it exists nearly in every cell of body (B.L.Vallee, D.S. Auld, 1989). 1.4-2.3 gr zinc exists in an adult male and 60 mg zinc exists in a newborn infant. % 80-90 of all body zinc exists in muscles, skin and bones, but it doesn't form a storage since its mobilization is limited (Y.Üçkardeş, 2006).

Since zinc is necessary for many enzymes in metabolism, a serious zinc absence will affect muscle functions negatively. A low muscle-zinc level will decrease the capacity of endurance as a result (A. Cordova, AlvaM.rez-Mon,1995). Zinc doesn't have a very special storage like iron as well as its toxicity is low. So taking zinc regularly through a diet is needed. For the continuation of zinc level, zinc loses with sweat, urine and similar ways should be replaced (A.S.Prasad,

et all., 1993). It was reported clearly that physical exercise affects zinc metabolism (M. Marrella, 1993) and a short-time exercise has an effect on zinc metabolism (A. Cordova, M. Alvarez-Mon, 1995). Trace mineral zinc has an important role on endocrine and immunity systems. Zinc mostly exists in liver and it is stored as an independent enzyme in musculoskeletal system. Physical exercise may affect antioxidant enzymes like CuZn-SOD and Mn-SOD. But its effect on regular acute exercise and physical activity is disputable **(C.** Nakao, 2000). Nowadays, it is known that zinc has important roles in metabolic events, protein, carbohydrate, energy, nucleic acid, lipid and hem synthesis, gene expression, immune system maturation, tissue synthesis and embryogenesis (A. Karadağ .,2006).

Therefore, it is aimed in this study to compare urine-zinc values of footballers doing training in Middle East Industry-Trade Center (MEITC) and footballers doing training outside MEITC.

MATERIAL AND METHOD

In the research, 14 amateur footballers, whose age-average is 24,00 ± 3,46 year, height-average is 1,76 ± 0,05 meters, body weight average is 70,79 ± 6,70 kg and sports-age average is 11,71 ± 3,49 year and who live and do training in Ankara MEITC region and 10 amateur footballers , whose age-average is 20,40 ± 0,84 year, height-average is 1,75 ± 0,07 m, body weight average is 69,70 ± 7,81 kg, sports-age average is 6,50 ± 1,84 year and who live and do training outside MEITC region, were participated voluntarily.

Footballers participated in research had the same physical level. Because, when the research was carried out was the competition term. One tube of urine specimen was taken from the footballers participated in the research when they were rested during competition season. The urine specimen taken was analyzed in Gazi University Education Faculty Biochemistry laboratory through Anodic Stripping Voltammetry (ASV).The gotten results were recorded in computer environment

Statistical Analysis

SPSS 10,0 packet program was used in the analysis of the gotten data. The data were abstracted through average and Standard deviation. T test was used in independent groups in comparison of urine-zinc values of footballers living and doing training in industrial region and footballers living and doing training outside industrial region. The error level was evaluated as 0.05 in this study.

RESULT

Table 1. Physical characteristic data for the test subjects.

Variables	*Footballers in industrial region* ***(n = 14)***	**Footballers in outside industrial region (n = 10)**
	M ± SD	M ± SD
Age (year)	24,00±3,46	20,40±0,843
Body height (m)	1,76±0,056	1,75±0,078
weight (kg)	70,79±6,70	69,70±7,81
Sport of Experiences age	11,71±3,49	6,50±1,84

When table 1 was examined, it has been determined that age-average is 24,00 ± 3,46 year, height-average is 1,76 ± 0,05 meters, body weight average is 70,79 ± 6,70 kg and sports-age average is 11,71 ± 3,49 year of the footballers doing training in industrial region and age-average is 20,40 ± 0,84 year, height-average is 1,75 ± 0,07 m, body weight average is 69,70 ± 7,81 kg, sports-age average is 6,50 ± 1,84 year of the footballers doing training outside industrial region.

Table 2. The comparison of urine zinc values for footballers.

Variables	***N***	***Mean***	***SD***	***St. Eror***	***Difference means***	***t***	***P***
Footballers in outside industrial region (μgl^{-1})	**10**	**1,5040**	**0,3554**	**0,1124**	**1,2810**	**3,401**	**0,003***
Footballers in industrial region (μgl^{-1})	**14**	**2,7850**	**1,1458**	**0,3062**			

*P<0,05

When table 2 was examined, a statistical difference has been found in comparison of zinc values of footballers doing training in industrial region and footballers doing training outside industrial region.

Discussion and conclusion

In this study aiming the comparison of urine-zinc values of footballers doing training in industrial region and footballers doing training outside industrial region, a statistical difference has been found between zinc values of footballers participated in research considering their doing training in industrial region and outside industrial region ($p<0.05$). In the research which Pizent et al. (2003) carried out over 156 control group and 299 healthy men aged 20-25 and living in industrial region in Zagrep and being exposed to zinc, copper and cadmium elements, they reported that these elements had an important effect on serum concentration (Al.Pizent, J. Jurasoviç, S. Telisman, , 2003). In this study which was carried out with the aim of determining if there was a difference between the trace element levels in 24 –hour urine of the workers in Cinkur and the trace element levels in urine specimen of control group and examining the effects of working environment on trace element amounts in human body, the elements such as Fe, Zn, Pb, Mn and Cu in 24-hour urine of the study group were observed to be statistically higher at a significant level than the control group (Y. Yagmur, 1994). In a research which was carried out over male workers having no illness in Black sea Copper Operations Joint Stock Company Samsun Operation management, no difference in copper and zinc levels in people in the company was observed compared to the people outside the company. The result why copper and zinc levels are normal may result from plasma levels' being unable to show body copper and zinc situation entirely S.Aslan, 1999). E. Kara (2007) carried out a zinc application over 20 young male wrestlers and determined that serum and zinc levels measured after application increased significantly compared to the ones before application and showed that zinc application activated antioxidant system in athletes (E.Kara, 2007). In the study which C.J. Koury et al. (2004) carried out over triathletes, sprinters, marathoners and short-long distance swimmers, whereas a significant decrease was observed in plasma zinc values of triathletes, an increase was observed in erythrocyte zinc values during the comparison of triathletes to other groups ($p<0.01$) (C.J. Koury, Oliveira De Va, et all.,2004). It is known that exercise changes zinc density a lot in circulation. Physical activity includes soft tissue trauma and also affects plasma zinc concentration. Plasma and serum zinc density increase immediately after the exercise with short, dense and long-term endurance exer cise (C.H.Lukaski,,2000**).**

To conclude; in this study carried out , zinc values of footballers living and doing training in industrial region have been found to be higher than the zinc levels of footballers living and doing training outside industrial region. Therefore, it is thought that ($p<0,05$) The zinc values of footballers doing training in industrial region have been found to be higher than the zinc values of footballers doing training outside industrial region in the research.

the trace elements in human body are affected by working and living environment and as well, it can be said that this situation should be taken into account by the trainers.

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THE INVESTIGATION OF THE RELATIONSHIP BETWEEN PHYSICAL PERFORMANCE and LUNG FUNCTION TESTS AT SPORTSMEN

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ABSTRACT

Importance of exercise in measuring the sportive performance of the sportsmen has been increasing in recent years. Therefore, lung function and exercise tests have been quite attractive for the researchers in specifying the appropriate sportsmen and evaluating their pre-seasonal performance.

This research has been planned to specify the relationship between the lung function and exercise tests of the footballers and basketballers playing with Diyarbakir Amateur Group and identify the differences between them and those not engaged in sports (the sedantery).

All groups were taken through the physical performance test and the time they completed the running distance was specified. Yet, spirometric measuring as lung function tests of all individuals was taken.

According to the outcomes of this study, the Vital Capacity, one of the static parameters of the lung was found high due to the control group of the basketballers ($P < 0,05$). The dynamic respiration parameters of the basketballers FEV1/FVC, MVV values ($P < 0,001$) and FEF%25 of the basketballers were found to have considerable difference with those of sedentary.

Whilst the increase observed with FEV1/FVC ratio and MVV with footballers, the FEV1 and FEF%25 value was found to be rather high as $P < 0,05$.

Whilst no difference between the time to cover the running distance between basketballers and sedentary was specified, this time period was found to be rather low with footballers compared with other two groups.

It was concluded that lung function tests are required to be handled together with skill and coordination tests in evaluating the competence and the performance of the sportsmen.

Key Words: Basketball, football, physical performance, spirometric tests.

Introduction and purpose

Sport has become a major social event nowadays. Sport maintains its development as an important sector via planning made in accordance with scientific principals. Besides, it can also be evaluated as gaining the habit of regular exercising which is important in terms of health. The aim of people dealing with sport is to develop physical and mental health, to provide the sense of self-confidence and to achieve the ultimate performance.

In recent years, the perception of the importance of sport for the health of both the individual and the society resulted in positive developments in sport sciences. Exercise physiology which is an important branch of the sport science also developed with a great acceleration in parallel with these developments and became one of the most important subjects in terms of sport.

The importance of regular exercise for health is clarified each passing day. Exercises enable the muscles, bones, articulations and cardiovascular system to function most properly.

Making sport regularly and for a long period increases the cardio-respiratory activity. Physiological properties that are specialized according to sport constitute the basic components for successful sport performance. Effective inspiratory capacity and physical appropriateness are the principal ones. In this context, determination of inspiratory capacity and application of improving exercise methods have become a crucial event in modern sports. Spirometrical measurements which give information about the resistance of air lines and air stream speeds and which are made in order to show the competence of the pulmonary function are frequently used in respiratory function laboratories.

This study is planned in order to determine the response of the football and basketball players in Diyarbakır amateur group to lung function tests and exercise tests and in order to put forward their difference from the sedentaries who do not make sport regularly.

Scope

Since both offence and defense systems are interbedded in sports of football and basketball and since the games are exciting, contentious and there is a struggle in close contact, every moment of watching the games give excitement to the spectators. Aside from depending on technical intelligence and mental factors, basketball and football games are sports that also require anthropometric and physiological parameters. Anatomic appropriateness, physiological strength and condition are not only the complement of team cooperation, technique and tactic but they are also an important effect in showing technical skill and in withstanding injuries and mutilations. Outstanding structural adjustment and physical strength are necessary to be successful and keep pace with the football and basketball of our day which is played in high tempo.

Today, team sports like basketball and football are more contentious and depend more on physical strength. When we analyze 1980s and 1990s, games in those periods depended more on technique. Coming to 2000s, that understanding changed and is replaced by another understanding which is completely different and which prioritize physical strength. Thus, in such team sports, more strong and powerful players in all aspects have began to be needed in order to obtain equity and superiority. The definition of athletically strong and powerful player is described as someone whose engine properties are developed (fast, swift, enduring) and who have the physical ability, muscle structure and a maximal inspiratory capacity that his/her branch requires. Therefore, along with the changing understanding of sport and type of struggle, training models and methods also show changes day by day. Together with the changing models, training methods that improve physical strength, include muscle work out appropriate to the branch and increase inspiratory capacity started to be applied in all branches and categories from amateur teams to professional ones. All these studies and measurements aim to use more objective determiners in player selection by determining the most appropriate anthropometric, physiologic and psychological properties for basketball, football and all sport disciplines.

In the light of all these improvements, basketball and football have become very attractive sport branches for researchers.

This research is carried out with 45 volunteer individuals from Güneydoğu Dicle Basketball Club, Yolspor Footbal Club and sedentaries from peer groups.

Material and method

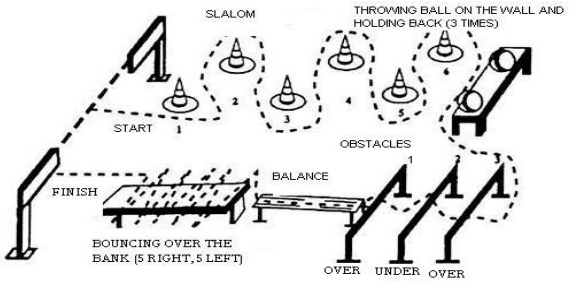
In order to form the test groups, 15 basketball players (age: 16.80 ± 0.14) in amateur league level and 15 footballers (age: 16.87 ± 0.34) were included in the study. Besides, a control group was formed with 15 peer sedentary individuals (age: 17.27 ± 0.27). All of the experimental subjects are males and they have been playing actively in the related branches for 5 years. The sedentary individuals who are the control group have not performed actively in any sport activity until today.

The study is comprised of two stages;

- Physical Performance Test (Skill and Coordination Test)
- Lung Function Test

In the first stage, the subjects are tested in the skill and coordination track prepared for them. This stage depends on the principle of subjects' completing the skill track racing against time. While preparing the track, it is taken into consideration that the test would not be peculiar to only one branch but it is aimed that the track would determine the skill, coordination, balance, speed, swiftness and flexibility of the sportsmen and sedentaries in general. Arterial blood pressures and hematocrit values of the sportsmen were measured before the physical test. In order to determine the hematocrit values, blood samples were taken before the exercise and preserved in capillary tubes. These blood samples that were preserved in tubes were later centrifuged and the hematocrit values of the subjects were determined.

Figure 1 - Skill and Coordination Track



As for the second stage, the subjects were taken to the laboratory and their spirometrical tests were performed. In order to avert the factors such as device adaptation problem, excitement and stress, pilot tests were performed before the main test. In the following stage, it was passed to the measurements.

All measurements were carried out in accordance with ATS (American Thoracic Society) criteria. Biometrical properties of the subjects were taken as basis while determining the predictive values of the parameters.

In the statistical evaluation of the results, SPSS 16.0 For Windows package program was used. The results were tested via Analysis of Variance (ANOVA). LSD method was used in the Post Hoc evaluation of the differences between groups.

Findings

In Table-1 the biometric properties (age, height, body weight) of individuals are compared. According to that, while there is not a meaningful difference between the groups in terms of age and body

weight, it is determined that the basketball group individuals' heights are significantly higher in proportion to the control and football groups ($p<0.001$).

The hematocrit values and systolic and diastolic blood pressures of all individuals are shown in Table-2. There is not a meaningful statistical difference between the groups in terms of these parameters ($p>0.05$).

In Table-3 the respiratory parameters of all groups and comparison results of track completion duration average values among groups are shown.

According to that, Vital Capacity value which is one of the statistical parameters of lungs is determined to be significantly high only in basketball group individuals compared to the control group ($p<0.05$).

Taking dynamic respiratory parameters of lungs into consideration, a significant statistical difference is determined when FVC1, FVC1/VC, MBC values ($p<0.001$) and MFRE values ($p<0.01$) in basketball group is compared to the control group.

As for the footballer group, while there is an increase in FVC1/VC rate and MBC value compared to the control group, FVC1 and MFRE value is found to be higher in a $p<0.05$ rate importance.

When the individuals are handled in terms of physical exercise tests, it is determined that the track completion durations of footballers are significantly lower than both control and basketball groups ($P < 0.001$ and $P < 0.05$ respectively). There is not a significant difference between the basketball group and control group individuals in terms of track completion duration.

Table 1 – Comparison of the biometrical properties of basketball, football and control group individuals

GROUPS	AGE (year) $\overline{X}$ ±SE	HEIGHT (cm) $\overline{X}$ ±SE	BODY WEIGHT (kg) $\overline{X}$ ±SE
CONTROL	17,27 ± 0,27	177,47 ± 1,25	73,47 ± 1,76
BASKETBALL	16,80 ± 0,14	187,07 ± 1,44*Δ	74,53 ± 1,63
FOOTBALL	16,87 ± 0,34	175,20 ± 1,05	70,33 ± 0,97

*; Statistical importance of the difference when compared with the control group
$p< 0.001$, ($x \pm SE$).
Δ; Statistical importance of the difference when compared with the footballer group
$p< 0.01$, ($x \pm SE$).

Table 2 – Comparison of the Hematocric value, systolic and diastolic pressure average value among groups before the physical test.

GROUPS	HTC (%)	SP (mmHg)	DP (mmHg)
CONTROL	43,20 ± 0,30	126,33 ± 4,79	73,33 ± 1,59
BASKETBALL	44,07 ± 0,34*	125,67 ± 4,52*	72,67 ± 1,53*
FOOTBALL	43,47 ± 0,33*	123,67 ± 3,95*	76,00 ± 1,84*

*; Statistical importance of the difference when compared with the control group
$p > 0.05$, ($x \pm SE$)

Table 3 – Respiratory parameter values and track completion durations of all groups.

GROUPS	FVC1 (L)	FVC1/VC (%)	MFRE (L/sec.)	MFRME (L/sec.)	MBC (L/min.)	TV (L)	ERV (L)	IRV (L)	VC (L)	TCD (sec.)
CONTROL	3.04 ± 0.06	76.94 ± 0.54	4.11 ± 0.13	3.76 ± 0.11	103.64 ± 1.10	0.68 ± 0.04	1.31 ± 0.05	1.97 ± 0.04	3.96 ± 0.06	35.46 ± 0.61
BASKETB ALL	3.45 ± 0.07***	82.99 ± 0.63***	4.75 ± 0.18**	4.13 ± 0.19	114.70 ± 2.48***	0.71 ± 0,04	1.43 ± 0.07	2.05 ± 0.04	4.19 ± 0.08*	34.09 ± 0.48?
FOOTBALL	3.28 ± 0.08*	82.61 ± 0.72***	4.61 ± 0.14*	3.74 ± 0.12	114.64 ± 2.71***	0.67 ± 0,03	1.31 ± 0.05	2.03 ± 0.03	4.00 ± 0.07	32.31 ± 0.42***

***; Statistical importance of the difference when compared with the control group; $p< 0.001$,(x ± SE),
**; Statistical importance of the difference when compared with the control group; $p < 0.01$, (x ± SE),
*; Statistical importance of the difference when compared with the control group; $p< 0.05$, (x ± SE).
Δ; Statistical importance of the difference when compared with the footballer group; $p < 0.05$, (x ± SE).

Discussion and conclusion

In order to research if there is a correlation between the physical performance test values and respiratory functions of sportsmen from different sport branches, individuals in youth category consisting of basketball players, footballers and control groups whose ages range between 15–19 are included in the study.

The physical performances of individuals are evaluated on the basis of their completion durations of the prepared skill and coordination track. As for their respiratory functions, it was performed by measuring their lung volume and capacities via spirometrical method. After the statistical analysis of the acquired results, it was passed on to the comment stage.

In course of the literature scanning we made before starting the study, we noticed that there are many studies available on the physical performances of the sportsmen; however, there are not so many studies researching the relationship between the respiratory functions and physical performance tests of the sportsmen. From this point forth, we carried out this study with 45 young male individual consisting of basketball, football and control groups.

According to the results we acquired, it was observed that the respiratory parameters of the footballers and basketball players are significantly high as compared with the control group individuals. Moreover, it was determined that the physical performance tests of the football group individuals are in an advanced level as compared with both basketball players and control group.

Consequently, it can be said that there is a positive relationship between the respiratory functions and physical performance tests of the sportsmen. We are of the opinion that taking some physiological parameters into consideration in parallel with the sportive skills while selecting players would be beneficial in order to increase sportive success. However, we consider that some more comprehensive researches must be done in order to make an ultimate judgement.

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INFLUENCE OF JUMPING EXERCISES ON THE DEVELOPMENT OF EXPLOSIVE POWER AT HANDBALL AGED 12 -13 YEARS

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ABSTRACT

Objective. Jumps exercises put in handball training are o good method to develop the as it can be remarked on this essay our intention is to develop the vertical detachment of twelve-thirteen years old (12-13) boys, knowing the fact that the force can not be developed by bar bells at this age.

Research Methods and Procedures. The research was conducted over 6 months, TI has made in September 2005, and the TF in February 2006. The trainings were held both outdoors and in both groups by training room is under the same conditions, the difference exists only in the fundamental experiment in group training where exercises were introduced themselves (which included the independent variable) for the development of explosive power .

The difference in driving systems of the two groups was the application for development exercises explosive power of the experimental group. Otherwise drive systems have followed the general physical and driving qualities, the same for both groups. In the number of training sessions were conducted three workouts per week that was identical for both groups so that the second training experiment group contained the independent variable.

Results. On the experimental group will see the results of subjects in the 3 successive jumps (541.667 ± 21.197 baseline and after six months 573.75 ± 18.563; at a threshold of significance $p \leq 0.0005$), vertical detachment on two legs (33, initial 75 ± 2.179 and 40.917 ± 2.61 after six months, at a threshold of significance $p \leq 0.0005$) foot vertical separation of battle (42.25 ± 2.094 initially and after six months 48.833 ± 2.368; at a threshold of significance $p \leq 0.0005$) increased due to implementation of training programs that contain the independent.

Discussion and Conclusions. Assuming the paper, the behavior of the dependent variable (distance traveled during the long jump 3 successive away with two feet vertically and on foot fighting) in the two groups (experimental group and control group), resulting in application independent variable (placing in training exercises for jumping).

Confirmed the hypothesis, that the method of jumping to handball novice influence of performance of subjects in the experimental group on the distance traveled during the 3 successive jumps, two feet vertical separation and vertical separation foot battle.

Key words: handball, detention, jumping exercises

Introduction

Modernization sport is a complex process of reassessment, the reassessment of what has proved and still proves valuable, and introducing new features requested by current guidance (D. COLIBABA - EVULEŢ, 1998). Continuous modernization of sport must find new methods, procedures and capacity to act in practice and continuous improvement of existing ones, those so-called classical In line with this task of great importance to sports we have developed this work aimed at achieving the higher odds of a goal important enough in general physical training novice athletes namely motor skill development and in particular the development of detention (G. RAŢĂ, B. RAŢĂ, 1999).

Almost impossible due to increased performance (that can not provide results of high level of skills young people have not even above average) to find the most appropriate methods and means of developing a task, and detention is a concern of many experts.

The purpose and tasks work

The purpose of the present work was observed jumping exercises influence on the development of detention at a beginner handball group consists of boys aged 12-13 years. Starting from the initial test is to measure the distance traveled during the three jumps chain, measuring the vertical detachment both run on two feet and breaking the leg of stroke and 6 months after final testing is accomplished in the same conditions as initial testing to see if they have had influence on the performance achieved by the distance traveled during the three jumps chain, the detachment foot vertical separation battle and, in a word on explosive power.

Research hypothesis

Selection and quantification of training is a necessary means outstanding in the current training process. (C. GEVAT, A. LARION, C. POPA, 2007).

Standardization and streamlining of training means the coach can provide sound and effective use of training time by testing exercises **(**C. RIZESCU, 2005). Given the purpose of the work - ways of developing explosive power legs, using the beginning I started jumping in handball at the following hypothesis:

- Which is contributed by jumping exercises used as a means of training the children start training on the behavior of the dependent variable, namely distance covered during the 3 successive long jump, the vertical detachment on two legs and foot fighting.

Subjects

When performing this experiment was attended by 24 male subjects engaged in group of beginner handball and who have never practiced any sport. The 24 subjects were formed into two distinct groups: the experimental group and control group (children being trained by Professor Georgescu Adrian at Sports Club Medgidia).

Protocol research

The research was conducted over 6 months, TI has made in September 2008, and the TF in February 2009. The trainings were held both outdoors and in both groups by training room is under the same conditions, the difference exists only in the fundamental experiment in group training where exercises were introduced themselves (which included the independent variable) for the development of detente .

Groups of control and has conducted training in the same conditions, not including the training exercises which included the independent variable.

Research monitors the two variables, the dependent variable and independent variable and positive or negative influence of these variables exerted by certain factors throughout the research. Evolution of the dependent variable, namely the evolution of the results on two feet vertically away with that on foot jump shot and three intertwined, like the independent variable is applied in the training and test conditions themselves. Thus both tests (TI and TF) were made in the room at a temperature of between 19-24 degrees in the morning on Monday at 8.30. Testing was done on the first day of the week because the children came after two days in which we are not specific effort, the rest.

Testing the dependent variable (two feet vertical separation that on foot jump shot and three chain) has been made on the parquet, by carrying out two tests, whichever is the best outcome for each subject, is written to achieve treatment statistical data.

Sports equipment during the test subjects was identical. There were no reported injuries or health problems (muscular or otherwise) arising before testing that could adversely affect the performance of subjects.

Actuation systems (the actual exercise of the training) were designed for the physical body with emphasis on speed of implementation force (without weight), detention and technical. In the preparation had an important role in implementing technical exercises themselves because the child had to acquire the correct mechanism to achieve coordination movements very good. Resistance has not been neglected; being developed in game motion weighted less in the preparation. Force had a higher share in developing the upper limb and trunk to the development of lower limbs. Explosive power of completed quality motive force for development of lower limbs. In the speed to pursue the development of amplitude, frequency movements, reaction speed and in particular the speed of execution.

The difference in driving systems of the two groups was the application for development exercises detention of the experimental group. Otherwise drive systems have followed the general physical and driving qualities, the same for both groups. In the number of training sessions were conducted three workouts per week that was identical for both groups so that the second training experiment group contained the independent variable.

Results

Table nr.1

GROUPS	Testarea	P	Distance traveled during the 3 successive jumps cm.	Vertical separation on two legs cm.	Foot vertical separation of battle cm.	Waist cm.	Weight Kg.
EXP	INITIAL	M ± Ds	541,667±21,197	33,75±2,179	42,25±2,094	160,167±11,51	50,33±10,272
		Cv	3,913%	6,456%	4,956%	7,013%	20,408%
	FINAL	M ± Ds	573,75±18,563	40,917±2,61	48,833±2,368	161,333±11,19	50,83 ±10,241
		Cv	3,235%	6,379%	4,849%	7,014%	20,146%
CONTROL	INITIAL	M ± Ds	539,583±20,038	34,083±1,881	42,75±2,301	160,417±11,14	50,33±10, 272
		Cv	3,714%	5,519%	5,382%	6,949%	20,408%
	FINAL	M ± Ds	540±19,268	34,833±1,749	43,333±2,229	161,5±10,85	50,75±9,965
		Cv	3,568%	5,021%	5,144%	6,718%	19,635%

Discussions

In the present study were followed over 6 months, several parameters such as distance covered during the 3 successive long jumps away with two feet vertically and on foot fighting, size, weight.

Assuming the paper, the behavior of the dependent variable (distance traveled during the long jump 3 successive away with two feet vertically and on foot fighting) in the two groups (experimental group and control group), resulting in application independent variable (placing in training exercises for jumping).

On the experimental group will see the results of subjects in the 3 successive jumps (541.667 ± 21.197 baseline and after six months 573.75 ± 18.563; at a threshold of significance $p \leq 0.0005$), vertical detachment on two legs (33, initial 75 ± 2.179 and 40.917 ± 2.61 after six months, at a threshold of significance $p \leq 0.0005$) foot vertical separation of battle (42.25 ± 2.094 initially and after six months 48.833 ± 2.368; at a threshold of significance $p \leq 0.0005$) increased due to implementation of training programs that contain the independent.

Results of control group subjects in the 3 successive jumps (539.583 ± 20.038 baseline and after 6 months 540 ± 19.268, at a threshold of significance $p \leq 0.05$), vertical detachment on two feet (34.083 ± 1.881 initially and after 34.833 ± 1.749 six months, at a threshold of significance $p \leq 0.01$) and vertical detachment battle foot (42.75 ± 2.301 initially and after six months 43.333 ± 2.229, the threshold of significance $p \leq 0, 01$) increased only by application programs which did not contain the independent variable.

It is noted that the successive jumps 3 (experimental group 541.667 ± 21.197, 539.583 ± 20.038 control group, at a threshold of significance $p \leq 0.05$), vertical detachment on two legs (the experimental group 33.75 ± 2.179, group 34.083 ± 1.881 control, at a threshold of significance $p \leq 0.05$) and vertical detachment foot battle (the experimental group 42.25 ± 2.094, control group 42.75 ± 2.301, at a threshold of significance $p \leq 0.01$) difference between experimental group and control group on initial testing is significant but a small threshold, which means that at the beginning of the experiment subjects in both groups were very slightly different on the results achieved by During the 3 successive long jump, vertical separation on two legs and foot vertical separation of battle since the subjects have not practiced any sports.

The difference between the two groups of test subjects in the final 3 successive jumps (the experimental group 573.75 ± 18.563, 19.268 ± 540 control group, the threshold of significance $p \leq 0.0005$), vertical detachment on two legs (group experiment 40.917 ± 2.61, 34.833 ± 1.749 control group; at a threshold of significance $p \leq 0.0005$) foot vertical separation of battle (the experimental group 48.833 ± 2.368, 43.333 ± 2.229 control group at a threshold of significance $p \leq 0.0005$) due to the introduction of training programs experiment group independent variable (jumping exercises). On the tests applied, results in the 3 successive jumps, two feet vertical separation and vertical separation foot battle if we can confirm that the effects of introducing the work and training programs jumping exercises are positive (significant) in children aged 12 -13 years.

Conclusions and proposals

Confirmed the hypothesis, that the method of jumping to handball novice influence of performance of subjects in the experimental group on the distance traveled during the 3 successive jumps, two feet vertical separation and vertical separation foot battle, which leads to the following conclusion:

- *Jumping method improves explosive power, significantly influencing the outcome of the distance covered during the 3 successive jumps, two feet vertical separation and vertical separation foot battle to handball novice aged 12 to 13 years.*

Size and weight of subjects over 6 months of days have evolved differently (significant difference between experimental group and control group on the TI and TF) so that did not influence the results of two groups, the distance covered during the 3 successive jumps, breaking the upright on two legs and foot vertical separation of battle.

We believe that placing the preparation handball jumping exercises is beneficial in enhancing performance detente legs, but it is conducted on a longer period of time, at least one year and on this basis we propose a model for training in composition to finds himself jumping exercises

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HEALTH, FITNESS AND ECONOMIC STATUS: A COMPARATIVE STUDY

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ABSTRACT

Objectives

Evaluation of body composition has become an important aspect of adult fitness and medically supervised rehabilitation programme. Suitable body composition is important for general health and appearance for maximizing athletic performance. The purpose of study was to prepare the estimates for the body fat for college youth. Another purpose of the study was to compare body composition of adult men of Delhi on the basis of economic status of living.

Methods and Procedures

For the purpose of present study five thousand adult males of Delhi State were selected randomly as the subjects for the study. The age of the subjects were ranging from 18-25years. Subjects were from various colleges of Delhi State. On the basis of family income, subjects were divided into three different age groups namely: low income group, middle income group and high income group. Following variables were selected for the purpose of present study: Body Density, Body Fat Percentage, Body Mass Index, Fat Mass and Skin folds thickness (Chest, Triceps, Sub scapular and Sum of three skin folds), Height, Weight and Activity. The scores for each variable were gathered for all the subjects separately and then pooled age wise. Analysis of variance was employed to compare the subjects belonging to different age groups, on different variables. The level of significance was set at 0.05

Results and Discussions

Analysis of results in relation to various income groups revealed significant differences between three income groups namely low income group, medium income group and high-income group on all the selected variables. Body Composition may be influenced by a number of factors such as age, sex, diet, and exercise. Height is genetically determined but its growth is also affected by the nutritional status, economic conditions and lifestyle of family. Height shows significant differences among three groups. It was low in low income group and highest in high-income group. Weight also tends to be more in high-income group because of increase fat percent and fat mass in high-income group. Aging is often associated with a gain in weight, an accumulation of body fat, a loss of lean tissue, demineralization of bone and decrement in aerobic power (Astrand, Astrand and Asa, 1973: Baur, 1960, Forber & Reina 1970, Malina 1969, Smith 1982). Both motor fitness variables sit-up and sit & reach showed decreasing trend. Activity level was also reduced. It was least in high income group and highest in low-income group. Both body fat percent and fat mass showed linear increase with increase in family income of subjects. This clearly indicates that economic status of an individual affects the body composition of the youth. Mean scores of all the body components were higher in high-income group than low and medium income group. Subjects belonging to high-income group have to lose maximum percentage of fat than other groups. In relation to lean body mass mean scores of medium income group was lower than the low-income group. Lack of exercise is the prime cause of obesity in all age groups. Obesity is defined as the condition of excess body fat. From the above discussion on the analysis of present study it can be concluded that reduced level of physical activity (as also indicated by reduced performance in two motor fitness variables) and increased family income at higher age may be attributed to the higher body fat percent, fat mass and body weight with the progression of age.

Key Words: body composition, economic status, body fat.

Introduction & Research Objective

Body composition is considered to be an important measure of health fitness. A high percentage of body fat relative to bone and muscle has been shown repeatedly to be predictor of wide range of degenerative diseases. Body composition is much better measure of health fitness. Suitable body composition is important for general health and appearance for maximizing athletic performance. For these reasons accurate measurements of body components are needed to develop sound preventive health and athletic programme. With growing supply of literature supporting the value of regular physical activity for health and fitness, the evaluation of body composition has become an important aspect of adult fitness and medically supervised rehabilitation programme. Body composition is a primary component of health related fitness. Exercise specialist typically assumes responsibility for evaluating the body composition of adults. Evaluation of body composition permits quantification of major structural components of body – muscle, bone, and fat. The accurate calculation of percent body fat is the true definition of fitness and obesity. The accurate measurement of lean body mass is now the most rational basis for nutritional and exercise prescriptions. The purpose of study was to compare body composition of adult men of Delhi on the basis of economic status of living. Another purpose of the study was to prepare the body fat estimates for college youth on the basis of their age.

Methods & Procedures

For the purpose of present study five thousand adult males of Delhi State were selected randomly as the subjects for the study. The age of the subjects were ranging from 18-25years. Subjects were from various colleges of Delhi State. On the basis of family income, subjects were divided into three different age groups namely: low income group, middle income group and high income group. Following variables were selected for the purpose of present study: Body Density, Body Fat Percentage, Body Mass Index, Fat Mass and Skin folds thickness (Chest, Triceps, Sub scapular and Sum of three skin folds), Height, Weight and Activity. The scores for each variable were gathered for all the subjects separately and then pooled age wise. Analysis of variance was employed to compare the subjects belonging to different age groups, on different variables. The level of significance was set at 0.05 For the purpose of analysis of data, Software SPSS for Windows (11.0 version) and Microsoft Excel 2000 were used to compare different groups on selected variables.

Results and Discussion

Table – 1
ANALYSIS OF VARIANCE OF SELCTED BODY COMPOSITION VARIABLES IN RELATION TO INCOME GROUPS

Table 1 reveals, all the variables listed above exhibits significant difference in relation to age.

Variable	Source of Variance	Df	Sum of Squares	Mean Square	F Ratio
Body Fat Percentage	Among Groups	2	8766.47	4383.23	329.56*
	Within Groups	4997	66461.44	13.30	
Fat Mass	Among Groups	2	7696.02	3848.01	416.76*
	Within Groups	4997	46137.89	9.23	
Lean Body Mass	Among Groups	2	4069.00	2034.50	82.28*
	Within Groups	4997	123555.03	24.72	
Body Density	Among Groups	2	.045	.02	324.64*
	Within Groups	4997	349	.00	
Body Mass Index	Among Groups	2	584.32	292.16	60.21*
	Within Groups	4997	24244.23	4.85	
Chest Skin Fold	Among Groups	2	9147.66	4573.83	387.66*
	Within Groups	4997	58957.47	11.79	
Triceps Skin Fold	Among Groups	2	6953.83	3476.91	267.89*
	Within Groups	4997	64854.033	12.979	
Sub Scapular Skin Fold	Among Groups	2	6601.240	3300.62	278.87*
	Within Groups	4997	59142.26	11.83	
Sum of Three Skin Fold	Among Groups	2	67058.11	33529.05	381.59*
	Within Groups	4992	439069.93	87.86	
Sit & Reach Test	Among Groups	2	7074.24	3537.12	53.93*
	Within Groups	4997	327703.92	65.58	
Sit Up	Among Groups	2	429.12	214.56	3.19*
	Within Groups	4997	335639.06	67.16	
Height	Among Groups	2	15450.44	7725.22	214.39*
	Within Groups	4997	180054.21	36.03	
Weight	Among Groups	2	22471.18	11235.59	241.85*
	Within Groups	4997	232145.31	46.45	
Activity	Among Groups	2	8863.81	4431.90	8.57*
	Within Groups	4997	583131.86	516.93	

*The F Ratio significant at the .05 level.
$F_{.05}$ (2, 4997) = 2.99

Table - 48
MEAN AND STANDARD DEVIATION OF SELECTED VARIABLES
FOR DIFFERENT INCOME GROUPS

Variable	Income Groups					
	Low Income Group		Medium Income Group		High Income Group	
	M	SD	M	SD	M	SD
Height	167.64	5.37	169.29	6.09	173.81	6.23
Weight	64.44	7.6	63.76	6.17	70.01	8.77
Sit Up	37.91	7.76	37.51	8.5	36.84	7
Sit & Reach	23.56	8.59	20.51	8.04	22.44	7.81
Activity	38.18	21.31	36.31	23.11	33.3	22.38
Body Density	1.0702	.0089	1.0689	.0075	1.0605	.0112
Body Fat Percentage	12.58	3.87	13.1	3.28	16.82	4.94
Fat Mass	8.15	3.29	8.27	2.57	11.86	4.59
Lean Body Mass	55.33	5.21	54.32	4.84	56.91	5.34
Body Mass Index	22.93	2.54	22.27	2.15	23.11	2.07
Chest Skin fold	9.74	3.44	9.69	2.78	13.63	5.72
Triceps Skin Fold	11.15	3.40	11.90	3.38	15.11	4.75
Sub Scapular Skin Fold	12.60	3.71	12.93	3.19	16.2	4.25
Sum of Three Skin Fold	33.49	9.64	34.53	8.19	44.94	13.76

In relation to body fat percentage, Fat Mass, Triceps Skin Fold, Sub Scapular Skin fold, Sum of three skin fold the sequence of obtained mean scores among all income groups was Low Income Group < Medium Income Group < High Income Group

In relation to Height, Sit Up, Body Density and activity, the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group > High Income Group.

In relation to lean body mass, Body mass index, chest skin fold, sit & reach and weight the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group < High IncomeGroup.

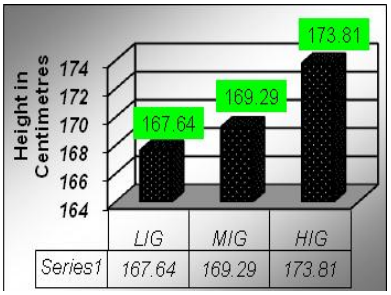

Fig. 1: Mean Height

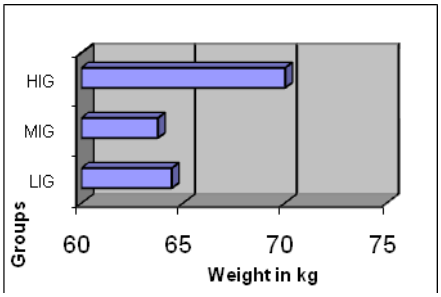

Fig. 2: Mean Weight

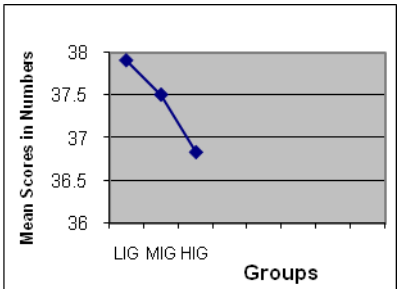

Fig. 3: Mean Sit Ups

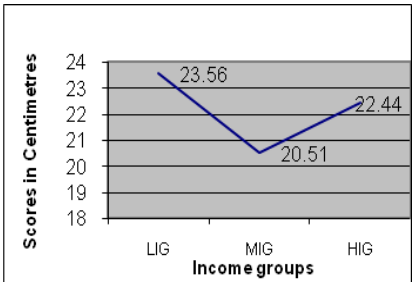

Fig.4: Mean Sit & Reach Scores

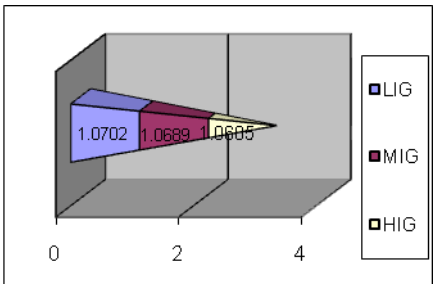

Fig. 5: Mean Body Density

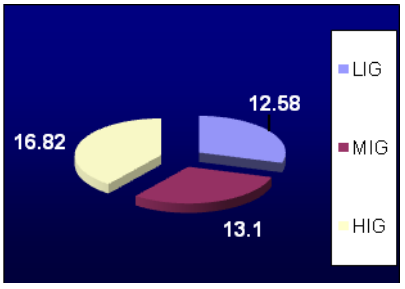

Fig. 6: Mean Body Fat Percent

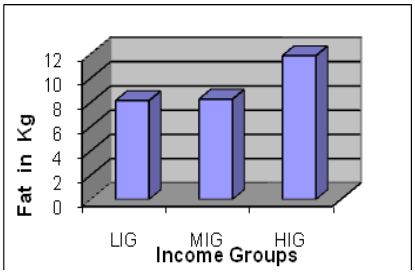

Fig. 7: Mean Fat Mass

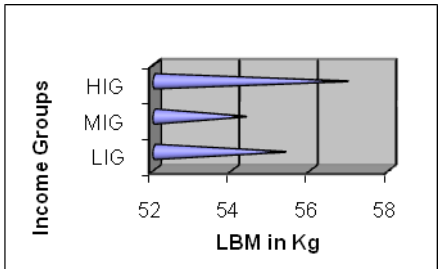

Fig. 8: Mean Lean Body Mass

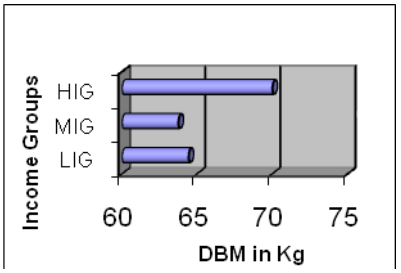

Fig. 9: Mean Desired Body Mass

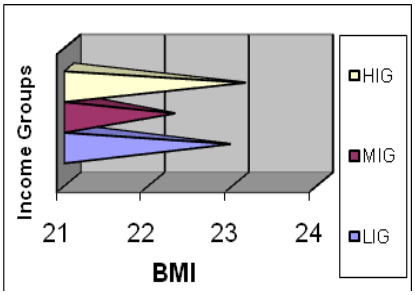

Fig. 10: Mean Body Mass Index

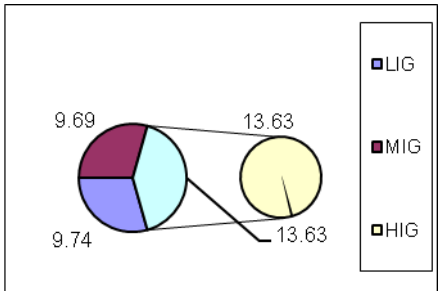

Fig. 11: Mean Chest Skin fold

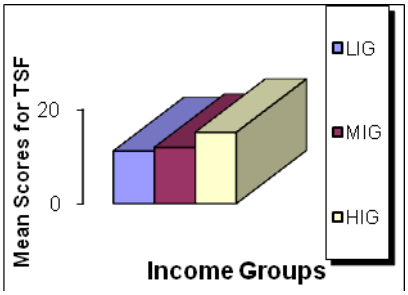

Fig. 12: Mean Triceps Skin fold

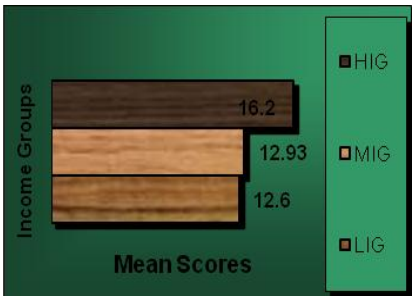

Fig. 13: Mean Sub Scapular Skin fold

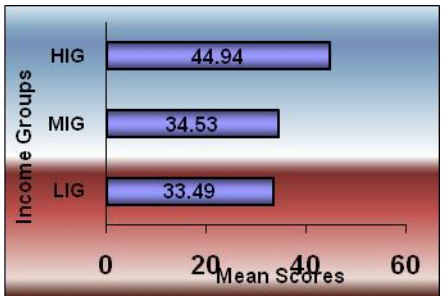

Fig. 14: Mean Sum of Three Skin fold

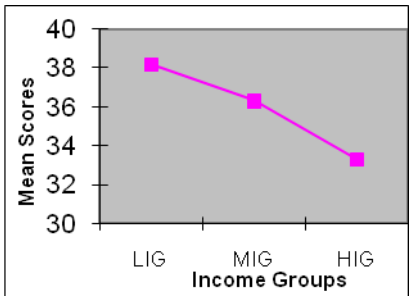

Fig. 15: Mean Activity Score

Table – 2
PERCENTAGE OF FAT ESTIMATED FOR COLLEGE YOUTH
(Sum of Chest, Triceps and Sub Scapular Skin Folds)

Sum of Three Skin Folds	Age Groups (in years) 18	19	20	21	22	23	24	25
10 – 12	2.33							
13 – 15	3.79							
16 – 18	5.22	5.56	5.42					
19 – 21	6.62	6.72	6.82	6.92	7.26	7.36		
22 – 24	7.98	8.08	8.19	8.29	8.39	8.5	8.6	8.93
25 – 27	9.31	9.41	9.52	9.62	9.73	9.83	9.93	10
28 – 30	10.6	10.7	10.8	10.9	11	11.1	11.2	11.3
31 – 33	11.9	12	12.1	12.2	12.3	12.4	12.5	12.6
34 – 36	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8
37 – 39	14.3	14.4	14.5	14.6	14.7	14.8	14.9	15
40 – 42	15.4	15.5	15.6	15.7	15.9	16	16.1	16.2
43 – 45	16.5	16.6	16.8	16.9	17	17.1	17.2	17.3
46 – 48	17.6	17.7	17.8	17.9	18	18.1	18.3	18.4
49 – 51	18.6	18.8	18.9	19	19.1	19.2	19.3	19.4
52 – 54	19.6	19.7	19.9	20	20.1	20.2	20.3	20.4
55 – 57	20.6	20.7	20.8	20.9	21	21.1	21.3	21.4
58 – 60	21.5	21.6	21.7	21.8	21.9	22.1	22.2	22.3
61 – 63	22.4	22.5	22.6	22.7	22.8	22.9	23	23.2
64 – 66	23.2	23.3	23.4	23.5	23.7	23.8	23.9	24
67 – 69		24.1	24.2	24.3	24.4	24.6	24.7	24.8
70 – 72		24.6	25	25.1	25.2	25.3	25.4	25.5
73 – 75			25.7	25.7	25.7	26	26.1	26.2
76 – 78			26.3			26.5	26.3	26.9

Table – 5

Range of selected body composition components for college youth

Age in Years	Body Fat Percent	Fat Mass
18	7.8 – 15.5	4.4 – 10
19	8.7 – 16	5 – 11
20	9.4 – 16.7	5.3 – 11.7
21	9.9 – 17.1	5.7 – 12
22	10.3 – 18	5.9 – 12.5
23	11 – 18.2	6.2 – 12.6
24	11.2 – 18.5	6.25 – 13
25	12.4 – 19.4	7 – 13.6

The range for body composition components is ± SD from reported mean value.

Discussion of Findings

Body Composition may be influenced by a number of factors such as age, sex, diet, and exercise. It was evident from the analysis that various age groups considered in this study showed significant differences on body composition components. The difference existed may be due to combination of various factors. Aging is often associated with a gain in weight, an accumulation of body fat, a loss of lean tissue, demineralization of bone and decrement in aerobic power (Astrand, Astrand and Asa, 1973: Baur, 1960, Forber & Reina 1970, Malina 1969, Smith 1982). Analysis of results in relation to various income groups revealed significant differences between three income groups namely low income group, medium income group and high-income group on all the selected variables. Height is genetically determined but its growth is also affected by the nutritional status, economic conditions and lifestyle of family. Height shows significant differences among three groups. It was low in low income group and highest in high-income group. Weight also tends to be more in high-income group because of increase fat percent and fat mass in high-income group. Both motor fitness variables sit-up and sit & reach showed decreasing trend. Activity level was also reduced. It was least in high income group and highest in low-income group. Both body fat percent and fat mass showed linear increase with increase in family income of subjects. This clearly indicates that economic status of an individual affects the body composition of the youth. Mean scores of all the body composition components were higher in high-income group than low and medium income group. Subjects belonging to high-income group have to lose maximum percentage of fat than other groups. In relation to lean body mass mean scores of medium income group was lower than the low-income group. Since analysis of variance was found significant in all the variables Scheffe's post hoc test was applied to test the inter group variability. Post hoc test revealed that variability does exist between the groups on body fat percent, body density and height. But variability does not exist between Low income group and Medium income group on fat mass, lean body mass, weight, chest skin fold, triceps skin fold, sub scapular skin fold and sum of three-skin fold. Two motor fitness variables sit up and sit and reach does not exhibits variability.

From the above discussion on the analysis of present study it can be concluded that reduced level of physical activity (as also indicated by reduced performance in two motor fitness variables) and increased family income at higher age may be attributed to the higher body fat percent, fat mass and body weight with the progression of age.

Conclusions

1. In body composition components significant difference was found among all income groups in relation to body density, body fat percent, fat mass, lean body mass, chest skin fold, triceps skin fold, sub scapular skin fold and sum of three skin folds.
2. In subject's characteristics significant difference was found among all income groups in relation to height and weight.
3. All the income groups showed significant difference in relation to activity level.
4. In relation to body fat percentage the sequence of obtained mean scores among all income groups was Low Income Group < Medium Income Group < High Income Group.
5. In relation to fat mass the sequence of obtained mean scores among all income groups was Low Income Group < Medium Income Group < High Income Group.
6. In relation to lean body mass the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group < High Income Group.
7. In relation to weight the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group < High Income Group.
8. In relation to body mass index the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group < High Income Group.
9. In relation to body density the sequence of obtained mean scores among all income groups was

Low Income Group > Medium Income Group > High Income Group.

10. In relation to chest skin fold the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group < High Income Group.
11. In relation to triceps skin fold the sequence of obtained mean scores among all income groups was Low Income Group < Medium Income Group < High Income Group.
12. In relation to sub scapular skin fold the sequence of obtained mean scores among all income groups was Low Income Group < Medium Income Group < High Income Group.
13. In relation to sum of three-skin fold the sequence of obtained mean scores among all income groups was Low Income Group < Medium Income Group < High Income Group.
14. In relation to sit & reach the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group < High Income Group.
15. In relation to sit up the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group > High Income Group.
16. In relation to height the sequence of obtained mean scores among all income groups was Low Income Group < Medium Income Group < High Income Group.
17. In relation to activity the sequence of obtained mean scores among all income groups was Low Income Group > Medium Income Group > High Income Group.

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Content

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❖ KINETOTHERAPY

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Requirements for the elaboration of the scientific papers

The experiment type paper
The research paper must include:
- **the title of the paper and the author** (authors) of the research; The title of the paper will be written with Times New Roman, Size 12, Bold, Align Left, The names of the author or authors of the research will be written with Times New Roman, Size 12, Bold, Align Left, one line under the title of the paper, preceded by the highest academic degree. Under the author's name, the department (departments) and institution (institutions) name will be written, through which the article can be assigned, the contact address and the e-mail of the person (persons) responsible with the manuscript mailing or reprint and the source of the material support in the form of the GRANTS (not more than 40 characters including spaces) if need be, with Times New Roman, Size 10, Align Left.
- **the structured abstract and 3-5 key words** will be written with Times New Roman, Size 10, Justified;
- **the introduction** and the object of the research will be written with Times New Roman, Size 10, Justified, two columns;
- **the hypothesis** (hypotheses) of the research, **the procedures and methods** of research (subjects, applied tests), **results**, **discussions**, **conclusions** will be written Times New Roman, Size 10, Justified, two columns;
- the **bibliography** will be written with Times New Roman, Size 10, two columns, First Line Indent 0cm, Hanging Indent 1cm, Left Indent 1cm. The names of the articles will be written in italics.

The essay type paper
The essay type paper must contain:
- **the title of the paper and the author** (authors) of the research; The title of the paper will be written with Times New Roman, Size 12, Bold, Align Left, The names of the author or authors of the research will be written with Times New Roman, Size 12, Bold, Align Left, preceded by the highest academic degree. Under the author's name, the department (departments) and institution (institutions) name will be written, through which the article can be assigned, the contact address and the e-mail of the person (persons) responsible with the manuscript mailing or reprint and the source of the material support in the form of the GRANTS (not more than 40 characters including spaces) if need be, with Times New Roman, Size 10, Align Left.
- **the unstructured abstract and 3-5 key words** will be written with Times New Roman, Size 10, Justified;
- **the introduction and the object of the research, the content, the conclusions** will be written with Times New Roman, Size 10, Justified, two columns;
- the **bibliography** will be written with Times New Roman, Size 10, two columns, First Line Indent 0cm, Hanging Indent 1cm, Left Indent 1cm. **The names of the papers/ articles will be written in italics.**
The chapters of the research paper will be written in Bold, **The diagrams and the tables** can be centered at the end of the paper. The accepted number of pages, including bibliography is of 6-8.
The paragraphs will have the dimensions of 1cm. (First Line indent 1cm, Hanging Indent 0cm, Left Indent 0cm). The borders of the page will be of 1,5cm up, down and right and 2,5cm left, and the **size of the page will be A4 (21cm x 29,7cm).**
The co-author is based on the substantial contribution to (a) creation and design or analysis and interpretation of the data, (b) creating the article's summary or the critical review of the article and (c) approval of the final version of the article in order for it to be published. The conditions (a), (b) and (c) must all be accomplished by each author. The general supervision of the research group is not enough to accomplish the condition of co-author. The members of the group that do not accomplish the condition of co-author can be mentioned, with their permission, at the section "Thanks".

The abstract and the key words

The abstract must not contain more than 150 words for unstructured abstracts (essay type) and 300 words for structured abstracts (experiment type). The abstract must be elaborated in English and Romanian (for Romanian authors). In the abstract there will be no abbreviations used.
The structured abstract must contain:

For the experiment type paper	**For the essay type paper**
- the author (authors) of the research and the title of the paper;	- the author (authors) of the research ant the title of the paper;
- the objective (objectives) of the research;	- the object of the research;
- the procedures and methods of research (subjects, applied tests);	- the content of the research (short summary);
- the results (main results);	- conclusions (main conclusion);
	- key words (between 3 and 5 key words, which punctuates

-discussions and conclusions (main discussions and conclusions); - key words (between 3 and 5 key words, which punctuates the interest areas of the article);	the interest areas of the article);

Example of structured abstract for the experiment type paper:

…….....

Introduction

The introduction will only contain strict and pertinent references (pro and cons) on the studies that have as a common subject the object of the research.

The research hypotheses

The hypotheses of the paper must be clear and concise.

Research methods and procedures

Subjects

The subjects involved in the experiment are described, their distribution in groups, identifying the age, the sex and other important characteristics. The experiments on human subjects are produced in accordance with the national legislation for the human protection and the Helsinki Declaration of 1975, revised in 2004. The names and the surnames of the subjects are not used, especially in the illustrative materials.

The work methods are identified, the apparatus on which the experiment takes place (presenting the name of the producer and the address between parentheses) and the statistic methods in detail. The new or considerably modified methods are described, motivating their choice and evaluating their limits.

Statistical analysis

The statistical methods are described with sufficient details, in order to understand and to check the results obtained. The names of the computer programs used for the statistical processing of the data are specified.

Results

The results are presented in a logical sequence, through tables and diagrams. The results expressed through text should not be found in the tables and/or diagrams and the other way around.

Tables

The tables cannot be introduced in the text as photographs. The tables must be numbered in the upper part, in succession in the order of the first text quoting, followed by a conclusive and succint title.

Table 1. Physical characteristics of the subjects

	Feminine subjects (n=21)	
Variables	M±DS	CV (%)
Body height (cm)	166,143±5,597	3,369
Body weight (kg)	61,524±8,364	13,595
IMC (kg/m^2)	22,338±3,282	14,692
Body fat percentage (%)	25,329±3,074	12,136
Fat mass (kg)	15,182±4,066	25,715

* significant correlated with IMC, r=0,875.

Established significance level at p<0,05.

IMC, body mass index; M, average; DS, standard deviation; CV, variability coefficient; n, number of subjects.

Tabelul 1. Caracteristicile fizice ale subiecţilor

	Subiecţi de sex feminin (n = 21)	
Variabile	**M ± DS**	**CV(%)**
Înălţimea corporală (cm.)	166,143 ± 5,597	3,369
Greutatea corporală (kg.)	61,524 ± 8,364 *	13,595
IMC (kg/m^2)	22,338 ± 3,282	14,692
Procent de grăsime corporală (%)	25,329 ± 3,074	12,136
Masa grasă (kg.)	15,812 ± 4,066	25,715

* semnificativ corelat cu IMC, r=0,875.
Prag de semnificaţie stabilit la p<0,05.
IMC, indicele de masă corporală; M, media; DS, deviaţia standard; CV, coeficient de variabilitate; n, numărul de subiecţi.

In the lower part of the table the following symbols will be used, in order to emphasize the differences or the significant correlations statistically, in the following order: *, †,‡,§,□□,¶**, ††, ‡‡, etc. Also in the lower part of the tables the significance level established by the researcher will be presented and the unusual abbreviations used in the table will be explained.

Each table must be quoted in the text. The tables from other publications must be used with the permission of the author (authors), indicating the bibliographical source from where it was assumed.

Diagrams (illustrations)
The diagrams must be numbered in the lower part, in succession in the order of the first text quoting, followed by a conclusive and succint title, preceded by the unusual abbreviations used in the diagram or other observations.

Measurement units
Measuring the length, height, weight and volume must be expressed in metric units (meter-m, kilogram- kg, liter- l, second- s, or decimal multiples). The temperature must be measured in Celsius grades (ºC), and the arterial pressure in mmHg. Other measurement units must be expressed in the International Units System (SI).

Discussions
In the chapter Discussions the new and important aspects are emphasized, which result from the data processing. The data of other similar studies presented in the introduction chapter cannot repeat in detail. Also, the implications of the results found must be discussed, their limitations and the implications of these results, for the future studies. The observations found must be reported to other similar studies.

Conclusions
The conclusions must be reported directly to the hypotheses of the paper and derive directly from the chapter Discussions. The conclusions that are not fully backed-up by the data found or that are based on unjustified affirmations must be avoided. New hypotheses can be concluded or attach some recommendations, if the case be.

Thanks
In the section Thanks (when the case appears) there can appear:
- the contribution of the people that are not co-authors;
- the name and surname of the people that have contributed intellectually to the accomplishment of the paper (with their agreement), but that are not co-authors- scientific counselor, data collector etc.;
- the financial help and the material support, specifying the nature of the support;
- the technical help (in a separate paragraph called "Other contributions");

Bibliography
Bibliography and text quoting
The bibliography must be arranged in alphabetical order, the unpublished papers being quoted, but that are registered for publishing. In the bibliography all the authors quoted in the text are written. In the text all the authors are written if there are 6 or less. If there are 7 or more authors, the first three authors are written, followed by "et al." (it comes from the latin "et alia" which means "and others"). If in the bibliography there are at least 2 papers that have an identical author (authors) and the publishing year, in the text, but in the bibliography as well, immediately after the publishing year, a letter will be written (in alphabetical order), in order to distinguish the papers in the bibliography ((1998a), (1998b)). The name of the author (authors) must be followed by the initials of the surname.

In the text, the quotations will have the following structure:
a) for one and/or two authors
- at the end of the phrase (T.S. Keller, and A.L. Roy, 2002);
- in the phrase T.S. Keller and A.L. Roy (2002), T.T. Gomez, 2003 found significant differences of isometric force...
b) up to (including) 6 authors
- at the end of the phrase (T.S. Keller, A.L. Roy, Carpenter G, 2002)
- in the phrase "Also, (.S. Keller, A.L. Roy, Carpenter G, 2002)found significant differences of isometric force..."
c) more than 6 authors

- at the end of the phrase (T.S. Keller, A.L. Roy, Carpenter G. et al 2002);
- in the phrase "Also, T.S. Keller, A.L. Roy, G. Carpenter et al (2002) found significant differences of isometric force..."

Generally, for magazines, the bibliography will have the following structure:
NAME OF THE AUTHOR- AUTHORS (year of publication), *Title of the article*, Magazine, number of the volume (yearly number the number of the supplement part): number of pages.
a) standard magazine article
b) organization as an author
c) no author
d) volume with a supplement
e) number with supplement
f) volume with part
g) number with part
h) number without volume
i) no volume and number
j) pages in roman numbers
k) indicating the type of article if it is necessary

For **books** the bibliography will have the following structure:
a) personal author(s)
b) editor(s) as author(s)
c) organization as author or the one that publishes
d) chapter in a book
e) license degree paper, dissertation or PhD. Thesis.
RISTARU, M., 2005, *The* i*nfluence of pliometry on the muscular development at the lower limbs level* [dissertation]. Constanta, The Faculty of Physical Education and Sport.

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For the **electronic materials,** the bibliography will have the following structure:
a) article in electronic format
b) computer program

Sending the manuscripts in electronic format
For the review of a research paper or a better organization of the research papers volume by the scientific board, the author (authors) will have to send a copy in electronic format (ASCII) in the format Word Microsoft Office. The papers in Romanian will be written with diacritical signs in the format Romanian (Legacy) of the computer keyboard. Also, the operating system used (Microsoft Windows XP, Microsoft Vista) and the processing program of the text (Microsoft Office XP, Microsoft Office 2003, Microsoft Office 2007) will be mentioned.

The evaluating/self-evaluating grid for the quality of the research paper by the reviewer/author(s)

The evaluating/self-evaluating grid for the quality of the research paper by the reviewer/author(s)		
1	The originality of the research theme	15 points
2	The quality of the research paper structure	5 points
3	The clarity and quality of the research hypotheses elaboration	10 points
4	The quality of the registration of the results and their presentation	10 points
5	The clarity and quality of the discussions directly linked to the results with reference to similar studies	10 points
6	The clarity and quality of the elaboration of the conclusions in accordance with the hypotheses of the paper	10 points
7	The applicability of the results found in the practical and scientific practice	10 points
8	The accuracy of the in text and bibliography quoting	10 points
9	The clarity and quality of the expression in the text	10 points
10	Strictly respecting the elaboration technical requirements	5 points
	Total	**100 points**

Based on these reasons, the article will receive from the reviewers' board a number of points. A number lower than 60 will lead to the rejection of the article, between 60 and 90 points the article will suffer certain changes from the point of view of the structure, expression in the text, etc. in order to receive the accept for publication, and over 90 points the article will receive the accept for publication, after small changes in the elaboration (if the case may be).
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Step 1
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Step 2
The article deposited for publishing must be accompanied by a short personal presentation and a professional CV, no more than 120 words, that must contain the detailed contact address, including phone number, fax number (if it exists) and the e-mail.
Step 3
At least two members of the Editorial Collective and of the Scientific Board will initially analyze the article and will nominate at least two reviewers to analyze the article in detail.
Step 4
The article will be officially analyzed by at least two reviewers with expertise in the thematics of the article deposited for publication. The article will receive a number of points from the reviewers' board.
Step 5
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Step 6
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