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❖ KINETOTHERAPY

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THE OPTIMIZING STRATEGIES OF LUMBAR DISK HERNIA REHABILITATION USING PHYSICAL THERAPY METHODS

CORDUN MARIANA[1], CALOTA NICOLETA[2]

Abstract
Purpose: To identify a physical therapy strategy which will optimize the somatic, functional and psycho-social rehabilitation of the patient with lumbar disk hernia.
Method: The study included 30 subjects, age 21-67 years old. For the global flexibility and the trunk muscles force were used the Krause Tests. The Oswestry Scale stabilized the disease impact upon the subjects quality of life.
The appliance of an original program of physical exercises upon the patients with lumbar disk hernia, meaning the combination of the Williams like moves with the McKenzie ones, in an active with resistance execution, can improve the physical therapy intervention.
Results and Conclusions: The subjects evaluation was made before and after the moving patterns appliance. The results obtained on the two evaluations, initial and final, are totally different.
Analysing and comparing the data, the conclusion is that active movements, upon a light resistance, on lumbar disk hernia patients do not increase their pain intensity. The combination of the Williams like exercises with the McKenzie method, in the same program, determines less symptoms.
Key words: Active moves upon a resistance; tonifying; the quality of life.

Introduction

Despite the methodological difficulties encountered, it can be proved that low back pain is the most common pain together with the headache. Between ½ and ¾ of the adults experienced the back pain once in their lifetime. About 40% of them had a flare once in a year and 15-20% can have an experience of this kind ever, at any time. Apparently, only 10-20% of the adults do not present back pains (Raspe, 1993).
Clearly, low back pain, the central symptom of a herniated lumbar disc is an endemic problem that will affect most mature individuals at some point in their lives. Lower-back pain is a symptom that describes a heterogeneous and dynamic state. Patients experience, from this point of view, varies depending on the duration, intensity, severity and degree of disability. Most chronical lumbar herniated disc pain is manifested by low intensity and low-disabilit, affecting only the severe minority. Some subjects have quite periods (without pain). However, given the high rate of prevalence of lumbar disc herniation causes a huge percentage of disability, having a significant impact on individuals and society.
The treatment of the patients with herniated disc varies considerably. There is no consensus on the best type of treatment for this dissease, so treatment applied is chosen according to the practitioner. Depends more on the person to whom the patient comes than his clinical symptoms (Deyo, 1993). Lack of effectiveness of physical therapy, considered by many current studies, systematic observation is reinforced by bed rest compared to remain active. It is proved that the rest is not always curative, but instead may delay recovery in acute pain. Instructed to remain active and resume normal activities as soon as possible, results in a faster return to work, reduced chronic disability and fewer relapses. If patients have to stay in bed during the acute phase, this shall be limited to a period of 2-3 days (Koes and van den Hoogen, 1994; Wadell et al, 1997; Hagen et al, 2000). This rule is applied even for lombosciatica crises (Vroomen et al, 1999). Must be emphasized the increasing trend towards activism, in an attempt to replace the old treatment concept, which promoted long periods of immobilization of the patient in acute phase and had the effect of fear of movement emergence, the maintenance of a vicious circle that hold further recovery. Thus, the overwhelming importance, that the exercise has in managing herniated lumbar disc, is emphased. Physical therapy helps the patient on the correct position by exercising weaknesses and regain that lost strength. An exercise program should be designed to take into account the physical condition of the subject and the intensity / level of pain. It must capture an optimal combination

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of stretching exercises, muscle toning and strength exercises effortlessly. Knowing the optimal physical therapy and the therapist right can make the difference between recovery and chronic pain.
Based on the context, the scientific approach we propose consists in designing a program of physical therapy to optimize improvement / abolish symptoms and prevent recurrence of lumbar disc herniation. Combining different types of physical education and sports physical therapy methods and means associated with physical therapy will intercede scientific approach.
Hypothesis: Applying original recovery program herniated lumbar disc, consisting of a combination type movements Williams, McKenzie type movements, executed active resistance as an alternative to classical program, physical therapy may increase the effectiveness of intervention.

Material and Methods

For the present study, we selected 30 subjects diagnosed with lumbar disc herniation, aged between 21-67 years.
To determine the degree of mobility in the lumbar segment it has been used the index-ground test, which consists in measuring the distance from the fingers to the ground during trunk flexion in standing position with the feet apropriate and knees locked. Typically the value is zero.
Krause tests were used to test the muscle groups involved in performing spinal muscular corset. The first three are tests for assessing the strength of the trunk flexors and quadriceps, 4 and 5 tests have the same thing for spinal extensors and hamstrings.
Each sample is marked as quotations muscular balance, from 0-5, with the same meaning: 0-zero (muscle does not produce any contraction), 1 -sketch, 2-poor, 3-acceptable, 4-good, 5-normal .
To assess the impact of painful lumbar status has on different sectors of life of patients Oswestry questionnaire was applied. Easy to complete (in about 5 minutes) by the subject himself, it enables the evaluation of clinical and functional status.
Oswestry scale includes the following ranking system:
- 0% - 20% minimum incapacity (disability);
- 20% - 40%) moderate incapacity (disability);
- 40% - 60% severe incapacity (disability);
- 60% - 80% maximum incapacity with severe disability;
- 80% - 100% of total incapacity, the need for restraint in bed.

Presentation recovery program herniated lumbar disc
Proposed movements are:
1. Hands behind his head, elbows as the side legs extended - ankle flexion-extension, 1 set x 8 reps.
2. In the same position, bend your knee towards your chest, 1 set x 8 reps with each leg.
3. One knee bent with foot on the ground - is bend your other knee towards your chest, pulling with hands, simultaneously bend your head to your knees, 1 set x 8 reps for each leg.
4. Knees bent, feet on the mat - simultaneously bend your hips on the trunk and pull your knees toward your chest with your hands, it returns to its original position, head still on the mat, 1 set x 8 reps.
5. Place one heel on the opposite knee, which is extended - running knee flexed hip abduction and returns to its original position, 1 set x 8 reps with each leg.
6. Knees bent, feet down - for pedaling motion with a single leg, 1 set x 8 reps forward, 1 set x 8 reps backward for each member.
7. Knees bent, feet on the ground, stuck together - departs and approaching knees (abduction - hip adductor), 1 set x 8 reps.
8.Same position, knees together go left-right movement as broad feet and shoulder blades remain on the ground, one set x 8 reps.
9. Knees bent, feet on the ground, slightly apart from each other, hands on the mat - amounts basin, retained the position 10 seconds slowly return, vertebra by vertebra, 1 set x 8 reps.
10. Knees bent, feet on ground, arms at your sides - the ground push the lumbar spine, shrink abdomen rises slightly on sacred ground, slowly return, 1 set x 8 reps.
11. Knees bent, feet down, get your hands in the air over the chest, 2 kg medicine ball with elbowsextended - bend your torso is 30 degrees, the ball easily lead to knee, slowly return, 3 sets x 10 reps in the first 3 sessions, 3 sets x 15 reps in sessions 4, 5, 6 and 3 sets x 20 reps in the last four sessions, with a break of 10-20 seconds between sets.
12. Lateral position, hands behind your head down, knees slightly bent, the torso and hips in extension 500g weight applied on ankles - upper limb hip abduction running and returns to its original position, 3 sets x 10 reps in the first 3 sessions, 3 sets x 15 reps in sessions 4, 5, 6 and 3 sets x 20 reps in the last four sessions, with a break of 10-20 seconds between sets.
13. Prone, the chin is placed on hands stacked with elbows to the side - Alternate head and chin rests on the hands, one set x 8 reps, just the right ear and left ear, one set x 8 reps.
14. Prone, chin on hands, a pillow under your abdomen - Bend your knees and extend them simultaneously, one set x 50 reps, free active in the first 3 sessions, active resistance in the following sessions, respectively 500g weight placed on the ankle in meetings 1kg in weight 4,5,6 and 7,8,9,10 meetings.
15. Prone, palms, forearms and elbows are supported the ground - push the palms and run simultaneously elbows and spine extension vertically ("cobra position"), slow, 1 set x 10 reps.
16. Prone, hands on the mattress in the shoulders, fingers forward - lifting the quadruped position for heel seat (stretching), return to start position, 1 set x 8 reps.

17. Quadruped position - stands alternately expanded upper member attached ear, 1 set x 10 repetitions for each upper limb, free active first 3 sessions, active resistance following sessions, respectively 500g weights placed on the wrist.
18. Quadruped position- rises higher and simultaneously a member of the opposite leg, extended, maintained position 10 seconds, alternating work (right upper limb - left leg, then the left upper limb - right leg), 1 set x 3 reps on each hand.
19. Quadruped position- Bend your one knee towards your chest then extended to the rear, 1 set x 8 reps with each leg.
20. Quadruped position, palms farthest knee - seat goes to heels (stretching), return the position, 1 set x 8 reps.
2,3,4,6 exercises were performed by active movements in the first 3 sessions free and active resistance movements (by applying the ankle weights 500g) in the last 7 meetings.

Comparative Analysis And Interpretation Of The Results

Characteristic values of the INDEX FINGER-LAND tests and KRAUSE - Oswestry scales were measured for 30 subjects in the two ratings.
Patient evaluations were performed before and after the movement scheme. The outcomes from the two assessments, initial and final one, differ statistically significant. Arithmetic mean calculated to all methods applied, have different values at the two assessments, with possitive developments. Standard deviation and coefficient of variation shows that the most frequently analyzed sample is homogeneous, their values at final testing, with clear downward trend, the results are closer values and goes to have a relatively homogeneous structure (for exemple:Krause for tests 1 and 4), which means progress.
The parameters in the process of verifying statistical hypotheses using t-test, rejecting the null hypothesis and accept the alternative hypothesis, the threshold of significance (p) calculated is lower than 0.05. Based on these results we can say that on average, the results of the evaluation methods are significantly different statistically, meaning that kinetic recovery programs implemented have given results.

Conclusions

Contrary to popular opinion, active resistance movements performed by patients diagnosed with herniated lumbar disc, with the criteria for inclusion in the experimental group should not cause increased pain.
Type combination of Williams movements is effective with the type McKenzie, in the same recovery program, resulting in diminishing symptoms.
Numerous studies carried out in recent decades, the incidence of low back pain on people of all ages, led placing the focus of physical therapy as a component of recovery programs. However, studies show that iatrogenic factors that can lead to chronic disease are exaggerated preoccupation with pain, over-prescription of rest and physiotherapy and off daily activities.
Passive therapeutic procedures seem to have no role in the recovery of the disease. Instead, there is evidence favoring the use of exercise, education, information and behavioral therapies.
Performed in a controlled, progressive, gradual exercise are designed to enhance the distribution of nutrients in the lumbar intervertebral disc and soft tissues to maintain health and function properly. Consistently repeated, physical therapy programs help prevent joint stiffness spine, muscle hypotonia and reduce recurrence flares or to reduce the severity and duration.
Exercise can create that favorable continuum decrease or even disappearance physical and psychological discomfort to the patient is installed with lumbar disc herniation, who receives affection as an obstacle arose in the normal course of his life. They are useful if they include programs that are individualized for each patient's condition and if executed correctly, observing a work pace appropriate, an optimal number of times throughout the course of motion. Therapist is to ensure the fulfillment of these conditions.

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IMPROVING THE POSTURAL BALANCE OF PERSONS WITH LOCOMOTOR IMPAIRMENTS

COTOMAN RODICA[1]

Abstract
The purpose of this paper is to identify strategies for improving balance in paraplegia by using specific means of physical education and sport.
Materials and methods. For the present study we selected 30 subjects, people diagnosed with paraplegia, aged 20-47 years. Evaluation of postural balance of participating subjects was performed using Functional Test extent of upper limb (Updated) - The Modified Functional Reach Test (mRFT).
Results. The analysis and processing can be seen that in terms of postural balance of subjects included in the study notes appear differentiated between the 2 tests (initial and final testing), so that an increase in the average values of 15, 37 to 30.90 units. Applied to functional recovery programs had significant results in terms of improved postural balance.
Conclusions. Any disruption of receptor-way transmission circuit-central nervous mechanisms affecting providing static and dynamic balance of the body. Paraplegia is one of many pathological conditions that are responsible for changes in balance.
Keywords. Balance, exercise, paraplegia

Introduction

Recent studies show that over the last 4 decades the life expectancy of the patients with locomotors disabilities has significantly increased due to continuous improvement of the treatment methods.

Thus, the apriori/theoretical knowledge and the practical experience comprised in the scientific works of the last years have outlined few strategies which can be applied in chronic diseases including spinal injuries. As general rule, the disability`s alleviating depends especially on technics which are giving to the patient the possibility to achieve a maximum independence despite the pathology`s presence:

- preventing and correcting the secondary pathology- through exercises for muscle toning and stretching to improve the physical parts needed for an independent motion; through techniques for reducing the contact between the desensitized bone surfaces in order to prevent eschars, ulcers etc
- increasing the functional capacity of the other systems that were not affected by the pathology- through progressive resistance exercises for upper body in order to facilitate the movement from one position to another;
- increasing the functional capacity of the systems that are affected by the pathology- through progressive resistance exercises for the muscle groups shortages to increase muscular fitness;
- using adaptive equipment to execute different fundamental skills – through training for using manual wheelchair, crutches, canes or braces and frame in order to achieve the motion;
- accessibility of spaces, access roads, etc
- using psychological techniques for emotional support- through group therapy, psychosomatic relaxation techniques etc.

Having as main premise the fact that all subjects with neuromotor and motor deficiencies can take advantage of the effects of the physical education and adapted sport according to the degree of their disability, the motility education, interests, educational objects etc, the programs including adapted physical exercises will be structured in three main directions: **handling various objects, postural adjustment, locomotion skills.**

a. The gestural activity reffers mostly to the hands executing prehension and manipulation of objects for which the subject need strength, amplitude and direction. Practicing to enhance strength will balance the agonist-antagonist muscles, depending on the deficit. Practising for the amplitude of movement will be subordinated to the precision and coordination. Practising for steering control involves limiting visual sense, the one that contributes the most to the precise execution of motor action in space and stimulating kinesthetic sense.
b. Postural adjustments are based on contractions of the trunk and lower limbs to support the work of gestural and includes static reactions (these opposing

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forces unbalanced) and dynamic reactions (they trigger reflex).

c. The locomotive skills are mastered after executing the postural adjustments and developing the capability of independent motion

The ability to maintain body balance requires a certain rebalancing its footing and following some high amplitude displacements and stresses. Loss of balance control is due to pain / problems that interfere peripheral proprioceptive sensory system and / or exteroceptive.

Paraplegia is the reduction or loss of motor and / or sensory lower limb resulting from a spinal injury. The spinal cord damage causes malfunction of the sensory and voluntary muscle activity of paraplegics, and this leads to an imbalance in the muscle groups responsible for controlling posture in sitting

Sitting balance is a person's ability to maintain control posture while bending the trunk, without losing balance. Ability to balance plays an extremely important role in the daily activities and especially in the paraplegics` locomotion. Most paraplegic people are wheelchair users, and this requires a very good control seated posture.

Postural balance body provides stability being provided by several components somato-sensory-sensory. Training these systems can be achieved during rehabilitation programs balance.

The purpose of this lecture is to identify strategies for improving balance in paraplegia by using specific means of physical education and sport.

Hypothesis: Systematic complex recovery programs will lead to an improvement in motor control and postural balance in individuals with paraplegia.

Material and methods. For the present study we selected 30 subjects, people diagnosed with paraplegia, aged 20-47 years. Evaluation of postural balance of the participating subjects was performed using Functional Test extent of upper limb (Updated) - The Modified Functional Reach Test (mRFT).

The upper limb functional extension test was designed to quantify the balance that allows the use of visual information but change body position. This test was modified in 1998 by S. Lynch and colleagues to assess the balance while sitting of the people with spinal cord injury. The test consists in making the subject to flex the trunk without losing balance;

Applying the test:

- Patient position: sitting on a stool, side wall with hips, knees and ankles positioned at 90 °, 5 cm space should be between the popliteal fossa and the edge of the chair, feet on the ground;
- Performed with a leveled yardstick that has been mounted on the wall at the height of the patient's acromion level in the non-affected arm while sitting in a chair
- The upper extremity from the side wall is 90 degrees of flexion;
- The patient makes a controlled flexion of the trunk;
- The distance between the initial and final position of the ulnar styloid process is measured;

The test for the functional extension of the upper limb (modified) was applied 3 times both initial testing and final testing, and the best result was considered.

It should be noted that, depending on the lesion, muscle flexion and extension of the trunk is limited. Thus, during the test, some patients succeded to execute a good stretch, but due to limitations of the back extensor muscles failed to return to its original position. The back and abdominal muscles strengthen process was one of the main goals of recovery in order to achieve an efficient retrieval of postural balance. The exercises in the rehabilitation program were conducted while training the 3 systems that provide postural balance: the sensory system, sensitive and vestibular system.

The training of the sensitive- sensory systems (visual system, somatosensory and vestibular):

- The training of the somato-sensitive information is achieved by disrupting sight, the individual standing on a stable surface;
- Training of the visual information is done by disturbing the somatosensory peripheral imput while maintaining stable vision (specifically directed)
- To train vestibular inputs must disturb the environment on the other 2-way information: visual and somatosensitive while vestibular information are stable (detecting head position) using unstable platforms while eyes are closed.

The ultimate objective of functional recovery is gaining the highest degree of independence, balance and control that the lesion is allowing so that paraplegics have personal autonomy to facilitate their socio-professional integration.

Presentation of the recovery of balance

Exercise 1

Subject`s position: quadrupedia

Exercise: the subject raises an upper limb alternately transferring weight from one side to the other.

Dosage: 4 sets x 4 reps on the left, the same on the right.

Exercise 2

Subject`s position: quadrupedia

Exercise: subject tries to transfer weight from one side to the other of the body and therapist resistance to hips

Dosage: 4 sets x 4 reps on the left, the same on the right.

Exercise 3

Subject`s position: quadrupedia

Exercise: subject tries to maintain balance while the therapist is applying unbalanced pulses in anterior-posterior and lateral plan;

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Dosage: 4 sets x 4 reps on the left, the same on the right.

Exercise 4

Subject`s position: quadrupedia, on a bench in front of a mirror

Exercise: subject performs a lifting upper limb before, its basin is supported by the physical therapist;

Dosage: 4 sets x 4 reps on each member.

Exercise 5

Subject`s position: seated, facing the mirror, knees bent at the edge of the table, upper limbs flexed 90 ° with a stick attached to the ends;

Exercise: subject leads baton overhead and running a slight flexion of the trunk, the therapist supports basin subject

Dosage: 4 sets x 4 reps.

Exercise 6

Subject`s position: sitting on Physioball, with feet on the ground, hands on knees;

Exercise: patient is doing pelvis swings, its legs are held by physical therapist knee

Dosage: 4 sets x 4 reps.

Exercise 7

Subject`s position: sitting on Physioball, with feet on the ground, hands on the side of the ball;

Exercise: patient is doing pelvis swings in anterior-posterior direction while on the lateral the physical therapist stabilizes his trunk

Dosage: 4 sets x 4 reps.

Exercise 8

Subject`s position: seated, facing the mirror, knees bent at the edge of the table with a ball in hand;

Exercise: subject is throwing the ball to the therapist and he is back passing him in different directions: left and right side, down or overhead

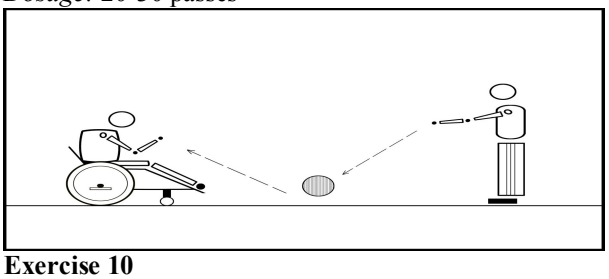
Dosage: 20-30 passes

Exercise 9

Subject`s position: seated in a wheelchair;

Exercise: Subject stands before physiotherapist at a distance of 2-3 meters, he passes the ball with both hands, the ball touches the ground and then is caught by both hands of the person in the wheelchair.

Dosage: 20-30 passes

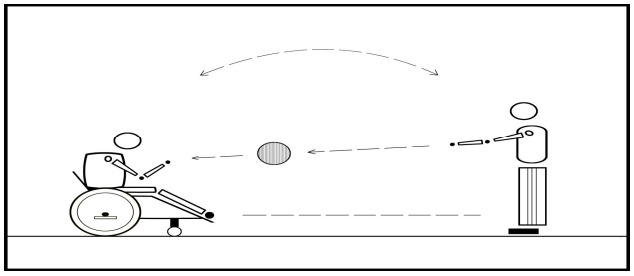


Exercise 10

Subject`s position: seated in a wheelchair;

Exercise: subject is positioned in front of the physiotherapist at a distance of 2-3 meters, he passes the ball with both hands on top

Dosage: 20-30 passes

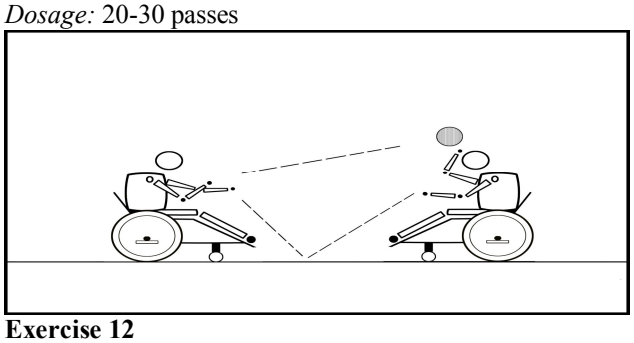


Exercise 11

Subject`s position: pairs, face to face;

Exercise: subjects stand at a distance of 1-2 meters, pass the ball with different methods from one to the other: two hands pass direct to the ground, overhead, pass with one hand on his shoulder;

Dosage: 20-30 passes

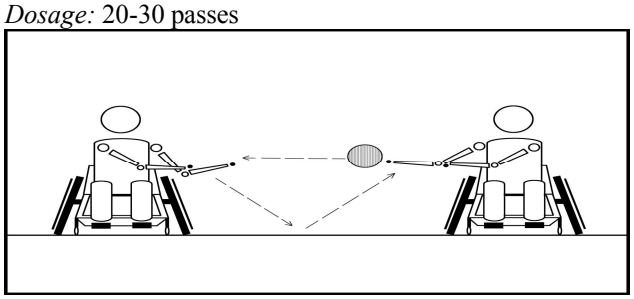


Exercise 12

Subject`s position: seated in a wheelchair;

Exercise: subjects are parallel placed at a distance of 2 meters from each other and move by executinh passes direct or earth from each other;

Dosage: 20-30 passes

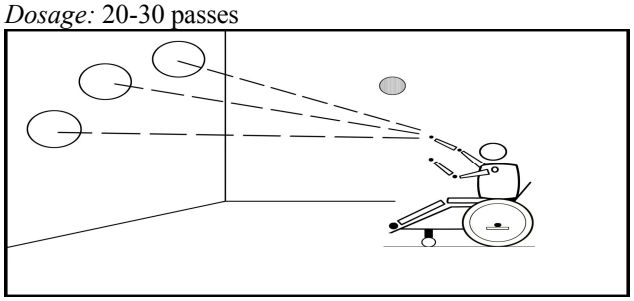


Exercise 13

Subject`s position: seated in a wheelchair;

Exercise: subject is facing the wall to a minimum of 2 feet, throw the ball towards targets (circles) attached at different heights

Dosage: 20-30 passes

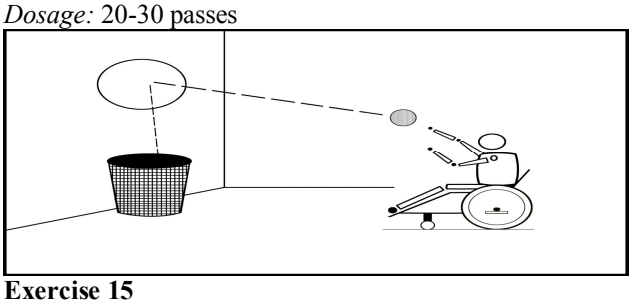


Exercise 14

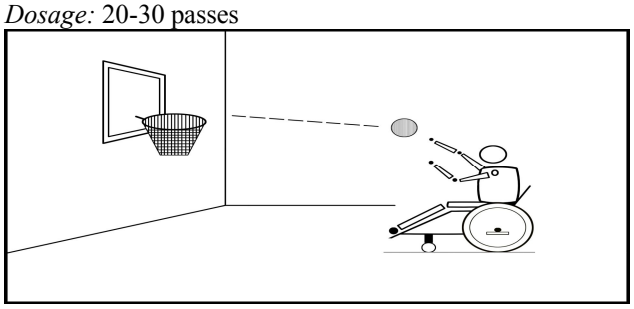
Subject`s position: seated in a wheelchair;

Exercise: subject is facing the wall to a minimum of 2 meters, throws the ball against the wall and try to hit

the circle (pasted on the wall) and then the ball fall into the cart;
Dosage: 20-30 passes



Exercise 15
Subject`s position: seated in a wheelchair;
Exercise: subject is facing the basketball panel 1-2 feet away, throws the ball to the basket with one hand or both hands
Dosage: 20-30 passes



The Analysis and the comparative interpretation of the results

Table 1. The extend of functional upper extremity – Statistical indicators

Statistical indicators	**Calculeted values**	
	Initial test	*Final test*
Arithmetic mean	15.37	30.90
Median	15.35	29.90
Standard deviation	3.32	3.06
Maximum value	20.60	38.90
Minimum value	9.60	25.40
Amplitude	11.00	13.50
Coefficient of variation (%)	21.62%	9.91%
Mean difference	-	15.53
Confidence level fixed(Cohen)	-	6.43

Table 2. The extend of functional upper extremity – Bilateral *t*- test

Confidence level fixed - α	α = 0,05
Null hypothesis H_0	m1 – m2 = 0
Alternaltiv hypothesis H_1	m1 – m2 ≠ 0
Number of subjects	n = 30
Critical t test	2. 05
Degrees of freedom	29

t test results	**Calculated t**	**P**

The results of THE FUNCTIONAL LENGTH of the upper limb were recorded for 30 patients in the two trials. There is an increase in mean values between the two tests, from 15.37 to 30.90. The difference between these values is 15.53 units. Depending on the values of standard deviation and coefficient of variation calculated, referring to THE FUNCTIONAL LENGTH of the upper limb, resulted that on the initial test the sample was homogeneous while on the final test the sample was homogeneous. Cohen size index indicating the effect of the differences between the results of two tests is large to very large. The analysis performed with the test revealed a bilateral t statistically significant difference between these environments, P = 0.000 is less than 0.05. The results indicate a positive development for patients as a result of the recovery programs, as can be seen from the graphs presented.

Conclusions

1. Sitting balance is a person's ability to maintain control posture while bending the trunk, without losing balance. Ability to balance plays an extremely important role in the daily activities and especially in paraplegics locomotion.

2. Most paraplegic people are wheelchair users, this requires a very good control of the seated posture.

3. The sitting balance recovery means on paraplegic persons are means of physical education and sport adapted to the lesion and their basic motric skills

4. People with spinal medullary lesions show a deficit of voluntary motor control and sensory control limiting the performance of the daily tasks and the overall effort.

5. In recent decades there is an increasing concern to policy makers in the health system, in promoting autonomy in everyday life by improving the quality of life and increased functional independence

6. It may be noted that in terms of postural balance of the subjects there are differentiated characteristics between the 2 tests (initial and final testing), so that an increase in the average values from 15.37 to 30.90 for units can be observed.

7. The programs used for functional recovery had significant results in terms of improving the balance at these patients and thus confirms the hypothesis.

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THE EFFECTS OF EXTRACORPOREAL SHOCKWAVE THERAPY (ESWT) FOR THE PLANTAR FASCIITIS IN PROFESSIONAL ATHLETES

DOBRECI DANIEL-LUCIAN[1], DOBRESCU TATIANA[2]

Abstract

Aim. This paper aims to highlight the effects of ESWT on plantar fasciitis in professional athletes who followed a conventional treatment, unsuccessfully.

Plantar fasciitis is a very frequent disorder that, unfortunately, affects a large and diverse number of professional athletes and ordinary people. The treatment of this disorder is very diverse, many times being aggressive to the patient, such as cortisone infiltrations, or surgery. Even so, the return of this disorder is quite frequent, many patients, in general, and athletes in particular, do not have a favorable response, not even after 3 or 6 months of conventional treatment. These aspects make the appearance of this disorder in professional athletes to be a real problem, because, in many cases, it comes back after the treatments, or does not even respond to treatments, the afflicted athlete missing entire competition seasons.

*Methods.*The experiment was conducted on a group of 17 professional athletes, diagnosed for at least 3 months with plantar fasciitis, men and women who came from various sports branches. Out of the total 17 athletes included in the study, 6 were track and field athletes, 5 female volleyball players, 3 badminton players, 2 male handball players, and one male soccer player. The study was conducted over a period of 3 months. The ESWT treatment was applied for 4 weeks, with a frequency of 2 sessions per week.

*Results.*The assessment of the studied subjects was performed by observing and recording the intensity of the pain felt by the subjects during walking, and the thickness of the plantar fasciitis that was measured by ultrasonography, at the beginning and at the end of the study.

The final results showed a significant decrease in the pain felt by the athletes, and in the dimension of the plantar

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aponeurosis.
*Conclusions.*After the application of the ESWT treatment, the patients felt much better, the positive results remaining two months after the treatment ended. Thus, one can say that positive results were obtained, and the ESWT treatment had an effect on the athletes with plantar fasciitis who did not respond to a conventional treatment.
Key words: shockwave, fascilitis, athletes.

Introduction

Plantar fasciitis is one of the frequent causes producing the so-called "policeman's heel," and conventionally it is believed that this disorder is caused by an inflammatory process in the plantar fascia. Currently, its cause is thought to be the degeneration of the collagen fibers in the fascia. This disorder affects approximately 2 million people every year - data for the USA, 10% of its population developing it over the course of their lifetime. (Lemont, Ammirati, Usen, 2003). From a biomechanical point of view, the plantar fascia represents one of the resistance structures of the foot, supporting the longitudinal medial arch on the bottom of the foot. This formation is extended when the foot arch is flat, absorbing the force of the impact when the heel contacts the ground. Anatomically and structurally, the plantar fascia is not flexible, and that is why, after repeated overuse, small lesions or even ruptures can appear. (Carlson, Fleming, Hutton, 2000).
The favoring and starting factors of the plantar fasciitis are multiple, the most common being:

- A flat foot, or, on the contrary, a foot with a too high arch - rigid foot;
- An orientation towards inside of the foot during walking;
- The excessive pronation of the foot;
- Unsuited shoes - heels that are too high; shoes that do not support the plantar arch; going suddenly from heels shoes to no heels;
- Running on tiptoes (especially when athletes are concerned);
- Repeated jumps (as is the case with volleyball, handball players, or track & field athletes);
- Standing for a long period of time, plantar fasciitis being also called the "policeman's heel";
- Running or walking on your heels, or on soft surfaces (sand);
- Rheumatoid polyarthritis, ankylosing spondylitis, lupus, reactive arthritis, psoriatic arthritis, etc.);
- Hereditary factors. (Riddle, Pulisic, Pidcoe, Johnson, 2003)

As incidence is concerned, this disorder is more frequent in women than men, being directly influenced by the type of physical effort that was performed, by standing, by weight. In the case of professional athletes, the most frequent cases of plantar fasciitis can be encountered in long distance runners, volleyball, handball, basketball players, dancers, tennis players, etc. (Buchbinder, 2004).From a symptomatic point of view, the dominant symptom in plantar fasciitis is pain. This appears on the medial plantar side of the calcaneus, on the lateral side of the ankle, or the dorsolateral side of the foot, when the injured foot is used, dissapearing when resting. It is more intense in the morning, during the first steps, or whenever the person starts walking or standing after resting. In the case of professional athletes, because of intense pains felt in the arch and heel, the clinical picture also comprises pains in the knee of the affected lower limb. (M_cPoil, Martin, Cornwall, Wukich, Irrgang, Godges, 2008).The diagnostic of plantar fasciitis is done most of the times based on inspection, touching, clinical signs, analysis of the foot during standing and during walking. According to the intensity of the pain, and of the resistance to treatment of plantar fasciitis, the physician can recommend supplementary imaging investigations, such as X-rays, soft tissue ultrasonography, tomography (CT scan), or Magnetic Resonance Imaging (MRI). In the case of professional athletes, the doctors usually recommend an ultrasonography for the tissues of the arch of the injured foot, and an X-ray of that foot, in order to see whether there is a calcanean osteophyte, which most of the times accompanies the plantar fasciitis. (Cole, Gazewood, 2005).The treatment of plantar fasciitis, in the case of both professional athletes and normal individuals, is complex and time consuming. In the case of professional athletes, the resistance to treatment of plantar fasciitis can mean, most of the times, missing the competitions from an entire season. The conventional treatment recommended in most cases of plantar fasciitis is:

- Rest, in regards to physical effort, in the case of professional athletes;
- Drug treatment - nonsteroidal anti-inflammatory drugs (NSAIDs) for 2-5 weeks. Local injection of corticosteroids can be an alternative when pain does not respond to usual NSAIDs administration. Frequent injections are not, however, recommended, because they can weaken and break the plantar fascia. (Tsai, Wen-Chung, Chih-Chin, Carl, Max, Tung-Yang, Ying-Jen 2006)
- Physical therapy that can include massage, electrotherapy (dynamic currents, ultrasound, laser), cryotherapy. (Osborne, Allison 2006, Genc, Hakan, Meryem, Bans, Hatice, Mahmut 2005)
- If conventional therapy does not give the expected results, the surgical intervention can be used only as a last resort, because the risk

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of complications is relatively high. Most patients report an improvement of the pain symptoms in the first 3 months, with complete remission within a year, in 90% of the cases. (Lynch, Goforth, Martin, Odom, Preece, Kottor 1998).

The Extracorporeal Shockwave Therapy (ESWT) is treatment still newly used in treating plantar fasciitis, and still in its beginnings. (Rompe, Furia, Weil, Maffulli 2007) .This treatment is nothing else but high energy pressure waves, generated outside the body, and focused on a certain point inside it. They are used in medicine since the eighties, in treating biliary, reno-urinary, salivary lithiasis, since the nineties for consolidating fractures, pseudarthroses, and currently for various musculoskeletal disorders. (Thomson, Crawford, Murray, 2005).

Method

This paper aims to highlight the effects of ESWT on plantar fasciitis in professional athletes who followed a classical treatment, unsuccessfully.

The experiment was conducted on a group of 17 professional athletes, diagnosed for at least 3 months with plantar fasciitis, men and women who came from various sports branches.

Out of the total 17 athletes included in the study, 6 were track and field athletes (4 males and 2 females - one 60m and 100m runner, 2 middle distance runner, and one long jumper), 5 female volleyball players, 3 badminton players (2 males and one female), 2 male handball players, and one male soccer player.

Table 1. Repartition of the studied subjects on sex and sport

Practiced sport	Females	Males	Total
Track & field	2	4	6
Volleyball	5	0	5
Badminton	1	2	3
Handball	0	2	2
Soccer	0	1	1

The study was prospective, randomized, single blind.

The criteria in choosing the subjects were:

- Plantar fasciitis, diagnosed at least 3 months before the beginning of the study;
- The athlete has unsuccessfully tried a conventional treatment;
- The lack of ruptures in the plantar aponeurosis, an aspect shown through an ultrasound of each athlete's injured plantar aponeurosis;

The research was conducted at a Medical Rehabilitation Clinic, in Bacau.

The assessment of the subjects was done by observing and recording the following:

- The intensity of the pain felt by the subjects during walking. This aspect was done by using the Visual Analogue Scale (VAS) for pain - 1=no pain, 10=very severe pain. This parameter was recorded at the beginning and at the end of the study.
- The thickness of the plantar fascia was measured by ultrasound, also at the beginning and at the end of the study. The condition for being included in the study was to have at least 4 cm thickness, hypoechogenicity, and alteration of the fibrillar pattern.

The study was conducted over a period of 3 months. Throughout the whole study, none of the athletes had any kind of treatment. The ESWT treatment was applied for 4 weeks, 2 sessions per week, every Monday and Thursday, cumulating a total of 8 sessions.

Table 2. The ESWT content

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The moment of application of the ESWT	Number of applied shocks	Area on which the shocks were applied
Monday	4000	Calcaneal plantar side, aponeurosis insertion, plantar aponeurosis
Thursday	4000	Calcaneal plantar side, aponeurosis insertion, plantar aponeurosis

Results

The final results showed a significant decrease in the pain felt by the athletes, and in the dimension of the plantar aponeurosis.

Thus, one can see from the analysis of Figures 1 and 2, that both the female and the male subjects recorded an almost identical evolution of the pain intensity, no matter their sports branch. If the initial pain intensity average value was 9.38 for females, and 9.56 for males, at the end of the study, the average pain values were 1.50 for the females, and 1.83 for the male subjects. (Table 3)

Table 3. The subjects' average pain value, on gender

Time of test	Females (n=8)	Males (n=9)
Initial testing	9.38	9.56
Final testing	1.50	1.83

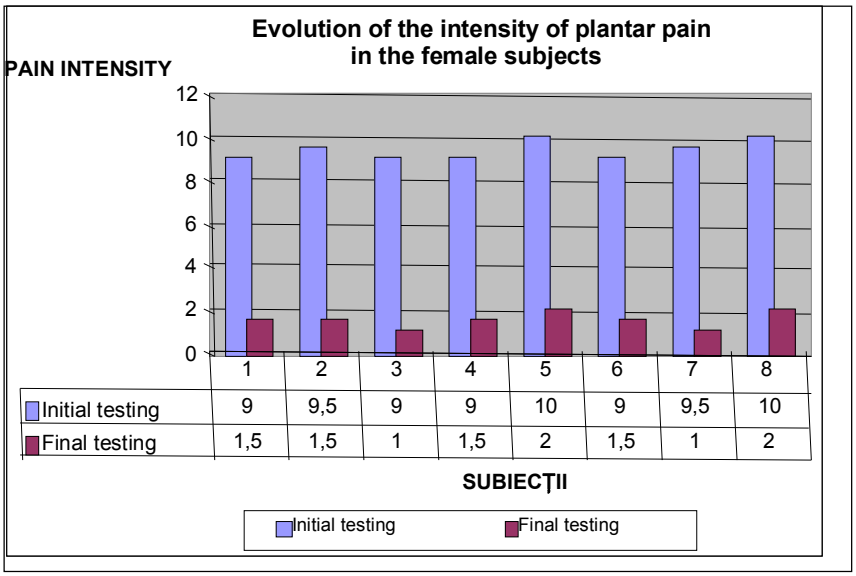

Figure 1. The evolution of the intensity of plantar pain in the female subjects

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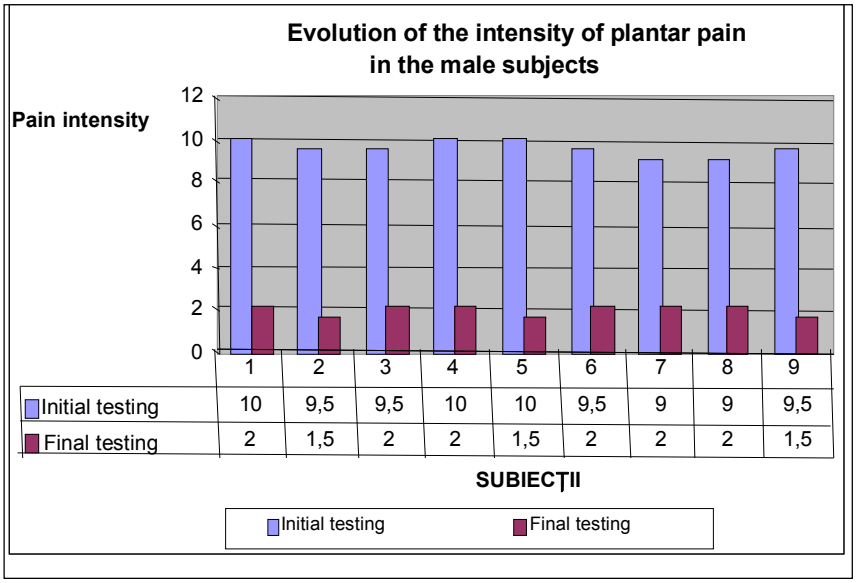

Figure 2. The evolution of the intensity of plantar pain in the male subjects

In regards to the evolution of the thickness of the plantar aponeurosis, both the male and the female subjects recorded a similar development over the course of the study. Thus, the initial values were, in average, of 5.84 cm in the female athletes, and of 5.87 cm in the male athletes. In the final testing, after the three months of monitoring, the ultrasound values of the plantar aponeuroses recorded a positive development, in the sense that they decreased, both in the female and the male subjects. Thus, in the final assessment, the average thickness of the plantar aponeurosis was of 5.21 in the females, and of 5.14 in the male subjects. (Table 4)

Table 4. The average thickness of the plantar aponeurosis, on genders

Time of test	Females (n=8)	Males (n=9)
Initial testing	5.84	5.87
Final testing	5.21	5.14

By analyzing Figures 3 and 4, one can observe the descending trend regarding the thickness of the plantar aponeurosis, between the initial and the final testing, both for the female and the male subjects, no matter their sports branch, the differences recorded after the plantar aponeurosis ultrasounds being considered to be very good.

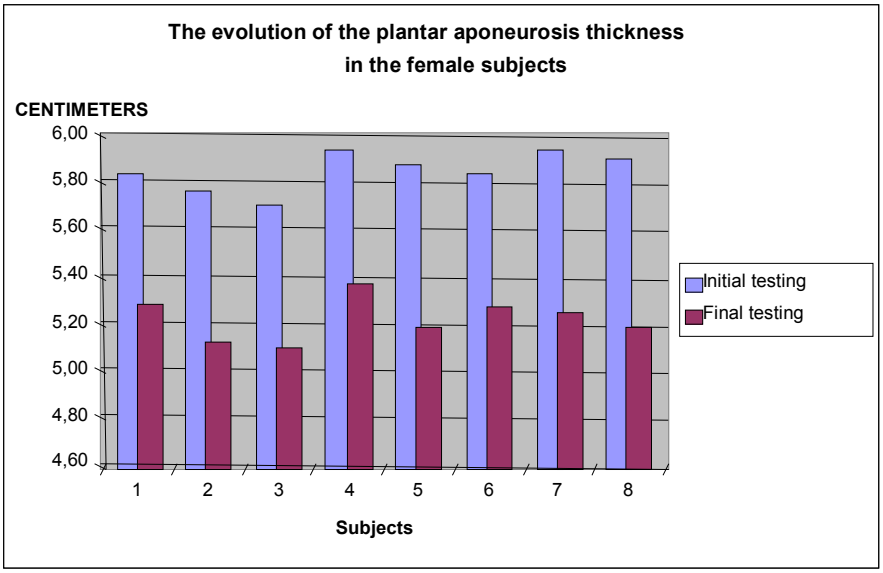

Figure 3. The evolution of the plantar aponeurosis thickness in the female subjects

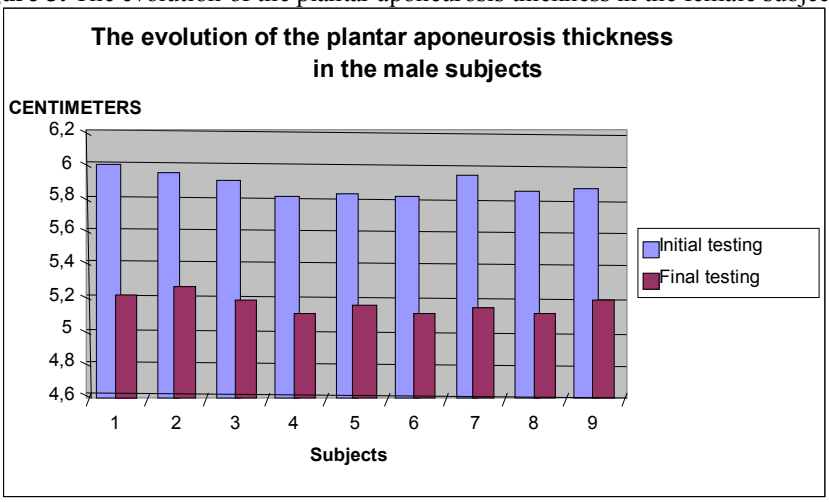

Figure 4. The evolution of the plantar aponeurosis thickness in the male subjects

To further support the statements above, the initial and final ultrasounds recorded for one athlete are presented below.

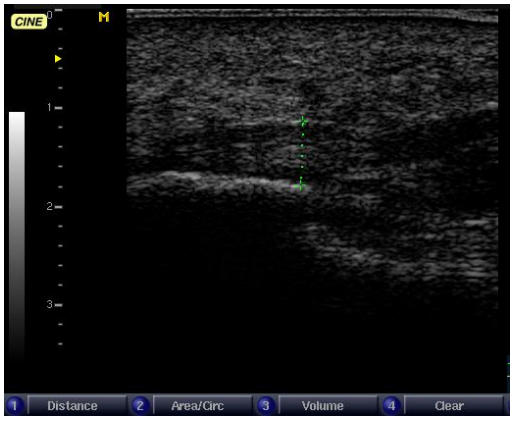

Figure 5. The initial thickness of the plantar aponeurosis for one athlete

Figure 6. The final thickness of the plantar aponeurosis for one athlete (3 months after the initial ultrasound)

Discussions

After the application of the Extracorporeal Shockwave Therapy (ESWT), all athletes, no matter their sports branches, and no matter their sex, recorded a very good development in regards to their clinical charts, both over the course of the four weeks of the shockwave treatment, and 3 months after the beginning of the study (2 months after the ESWT treatment was over). (Rompe, 2003; Thomson, Crawford, Murray, 2005)

Thus, one must see that, as these cases are concerned, the shockwave treatment was very effective in treating the plantar fasciitis, the athletes being able to resume their professional activity 2 months after the end of the treatment. (Lynch, Goforth, Martin, Odom, Preece, Kottor, 1998)

The value of this form of treatment is even higher, as the athletes have gone through all the forms of conventional treatment (except for surgery) indicated for plantar fasciitis, before beginning the shockwave treatment. (Tsai, Wen-Chung, Chih-Chin, Carl, Max, Tung-Yang, Ying-Jen 2006; Genc, Hakan, Meryem, Bans, Hatice, Mahmut, 2005)

Conclusions

The Extracorporeal Shockwave Therapy for athletes with plantar fasciitis presents the advantage of effectiveness, safety, and non-invasiveness.

After conducting this study, one can say that the positive effects produced by the ESWT treatment have maintained both on short term, and on medium term, unlike the drug and rehabilitation treatments, which had an effect only throughout the time they were applied.

Another conclusion is that the ESWT treatment is effective in treating the plantar fasciitis in athletes who went through conventional treatment without any result.

All these aspects allows us to say that this form of treatment is clearly superior to other treatments for plantar fasciitis, being a very good alternative for surgery, with clear superior benefits to the latter (lack of post-surgery infections, low treatment costs; large post-surgery convalescence period - several months, compared to the shockwave therapy, which takes very little time).

Another advantage of this form of treatment is that throughout the whole ESWT treatment period, the athlete can perform various types of effort that would keep him/her physically fit for sports, the only counter-indication being not to overwork the injured foot.

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CONTROVERSIES IN A CASE OF NEUROBORELIOSIS VERSUS AMYOTROPHIC LATERAL SCLEROSIS AND METHODS OF RECOVERY

DOCU AXELERAD ANY[1], DANIEL DOCU AXELERAD[2]

Abstract

Purpose.Because of difficulties in making the diagnosis of neuroborreliosis the physician must correlate clinical with laboratory data to confirm the diagnosis.Early on, personality changes, psychiatric symptoms, or cognitive manifestations may be the first, and occasionally the only, symptoms that the patient or family is aware of. Amyotrophic lateral sclerosis (ALS) is the most common degenerative disease of the motor neuron system. The cause of ALS is unknown, although 5-10% of cases are familial. The diagnosis of ALS is primarily clinical. Electro diagnostic testing contributes to the diagnostic accuracy

Material and methods: we exam a 63 year patient hospitalized in Neurology Department of Clinical Hospital of Constanta, between 10-20.12.2012.

Discussion. Our patient has an history of exposure to B. Burgdorferi one year before the apparition of symptoms. Family describes personality changes and mild cognitive manifestations. We must say that in past history he has an ethanolic abuse. Next symptoms were muscle pain and trouble of gait. It was suspected to have borreliosis and lab results show a little increase of IGM antiborrelia. After one year of antibiotic treatment the gait is worse and appeared trouble of speech and patient was admitted in our department. On clinical examination we found sign of upper and

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lower motor neuron symptoms.We perform serum immunology and LCR for borrelia was norm, MRI cerebral and cervical scan was normal, EMG show fasciculation and fibrillation potentials. We begin a neuromotor and physiologic rehabilitation.
Conclusions: it is important if the symptoms are not clear and the results of immunology is not complete to not begin treatment for borreliosis and the interdisciplinary consult is necessary to complete the diagnosis. After antibiotic treatment we observe that clinical sign worst.
Key words: neuroboreliosis, amyotrophic lateral sclerosis, differential diagnosis

Introduction

Early on, personality changes, psychiatric symptoms, or cognitive manifestations may be the first, and occasionally the only, symptoms that the patient or family is aware of.
Amyotrophic lateral sclerosis (ALS) is the most common degenerative disease of the motor neuron system.
The cause of ALS is unknown, although 5-10% of cases are familial.
The diagnosis of ALS is primarily clinical. Electro diagnostic testing contributes to the diagnostic accuracy.

Material and methods
We exam a 63 year patient hospitalized in Neurology Department of Clinical Hospital of Constanta, between 10-20.12.2012 .We initiate a rehabilitation program for preventing the spasticity.

Results and discussion

Our patient has an history of exposure to B. Burgdorferi one year before the apparition of symptoms. Family describes personality changes and mild cognitive manifestations. We must say that in past history he has an ethanolic abuse. Next symptoms were muscle pain and trouble of gait. It was suspected to have borreliosis and lab results show a little increase of IGM antiborrelia. After one year of antibiotic treatment the gait is worse and appeared trouble of speech and patient was admitted in our department. On clinical examination we found sign of upper and lower motor neuron symptoms.
We perform a cervical and thoracal MRI with disk hernia C6-7, Angi-CT of carotid vessel shows carotidian bulbar calcification bilateral, cerebral MRI normal.
We perform serum immunology and LCR for borrelia was norm. Borrelia Ig G, Ig M in LCR and serum. Albumine in LCR 356 mg/dl, albumine in serum 40.4g/l, QAlb 8.8, Ig G in LCR 30MG/L, Ig G IN SERUM 8.22G/L, QIgG 3.6, IgM in LCR 0.19mg/l, IgM in serum 0.5 g/l, QIg M(all results show absence of intratecal sintesis of Ig G and Ig M).

Table 1. The nerves

EMG	Insertion activity	Spontaneous			Motor unit potential				Recruitment pattern
		Fibrillat.	PSW	Fascicul.	Other discharges	Amp	Dur	Poly	
Tibialis anterior R		-	++	--	-	+	+	-	sarac
Vastus lateralis R		-	-	-	-	+	+	_	sarac
Tibialis anterior L		+	-	-	-	+	+	-	sarac
Gastroc caput med L		-	+++	-	-	+	+	-	sarac
Vastus lateralis L		-	-	-	-	+	+	+	sarac
Abd pollicis brev R		-	-	-	-	+	+	-	sarac
Abd dig min (man) R		-	-	-	-	+	+	-	sarac
Biceps R		+	+	-	-	+	+	-	Sarac

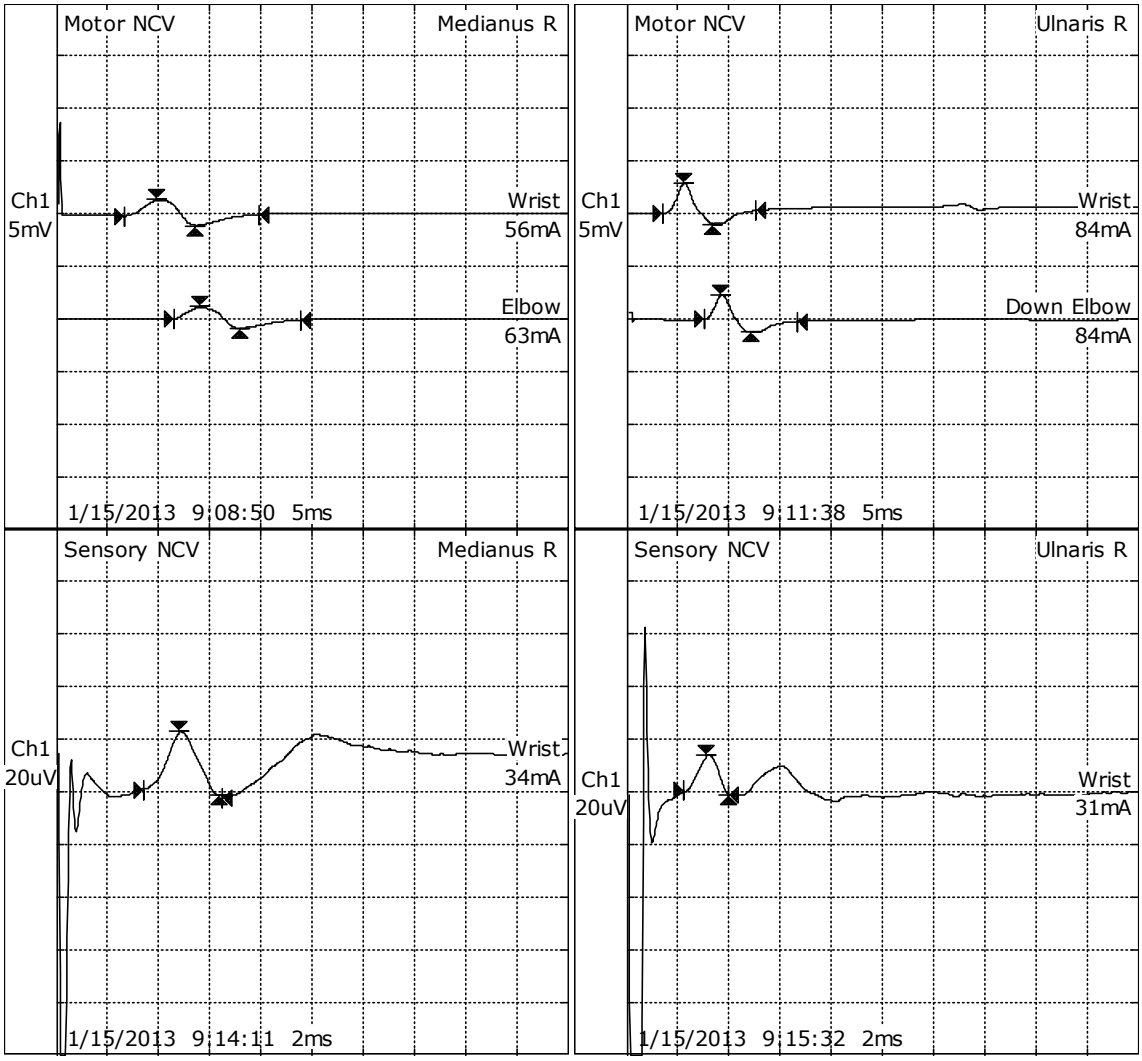
MNCV	Site/Segment	Latency	Amplitude	Duration	Area	Distance	NCV
		ms	mV	ms	mVms	mm	m/s
Medianus R	**Wrist-Abp**	6.6	1.7	13.2	9.3		
	Elbow-Wrist	11.5	1.2	12.4	7.8	195	39.9
Ulnaris R	**Wrist-ADM**	3.6	2.9	9.1	7.9		
	Down Elbow-Wrist	7.6	2.4	9.2	8.5	205	51.5
Peroneus R	**maleolla lat-EDB**	4.4	2.1	7.2	8.4		
	fibulla-maleolla lat	10.6	2.1	9.4	9.4	280	45.2
Peroneus L	**maleolla lat-EDB**	4.3	2.4	9.8	8.2		
	fibulla-maleolla lat	10.5	2.2	9.7	8.4	270	44.0

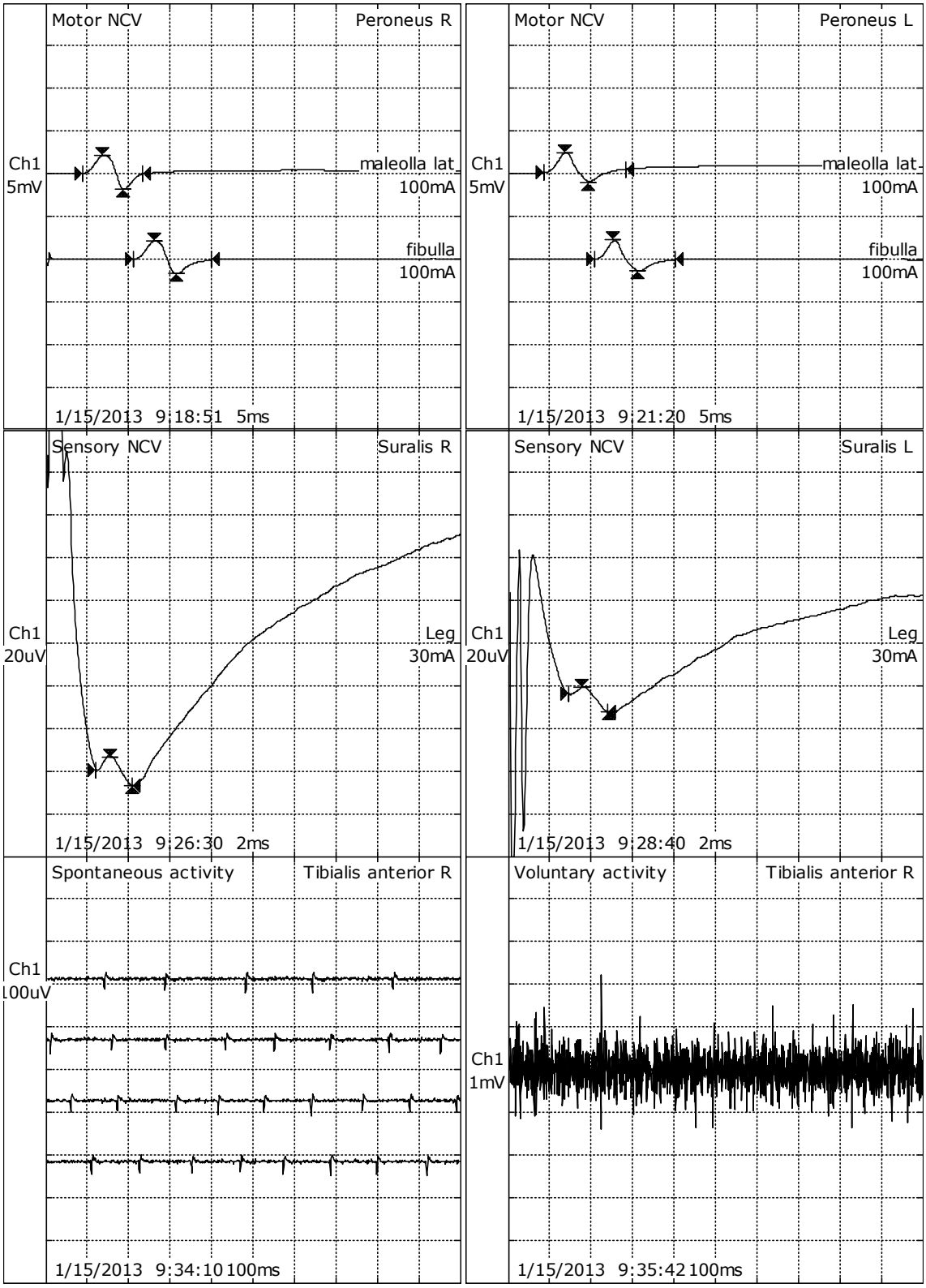
SNCV	Site/Segment	Latency	Amplitude	Duration	Area	Distance	NCV
		ms	uV	ms	uVms	mm	m/s
Medianus R	**Wrist-index finger**	3.4	22.7	3.1	24.2	150	43.9
Ulnaris R	**Wrist-V finger**	2.2	13.9	1.7	7.86	115	51.6
Suralis R	**Leg-Malleolus Lat**	2.4	6.31	1.7	104.4	100	41.5
Suralis L	**Leg-Malleolus Lat**	2.9	3.39	1.9	54.0	120	41.4

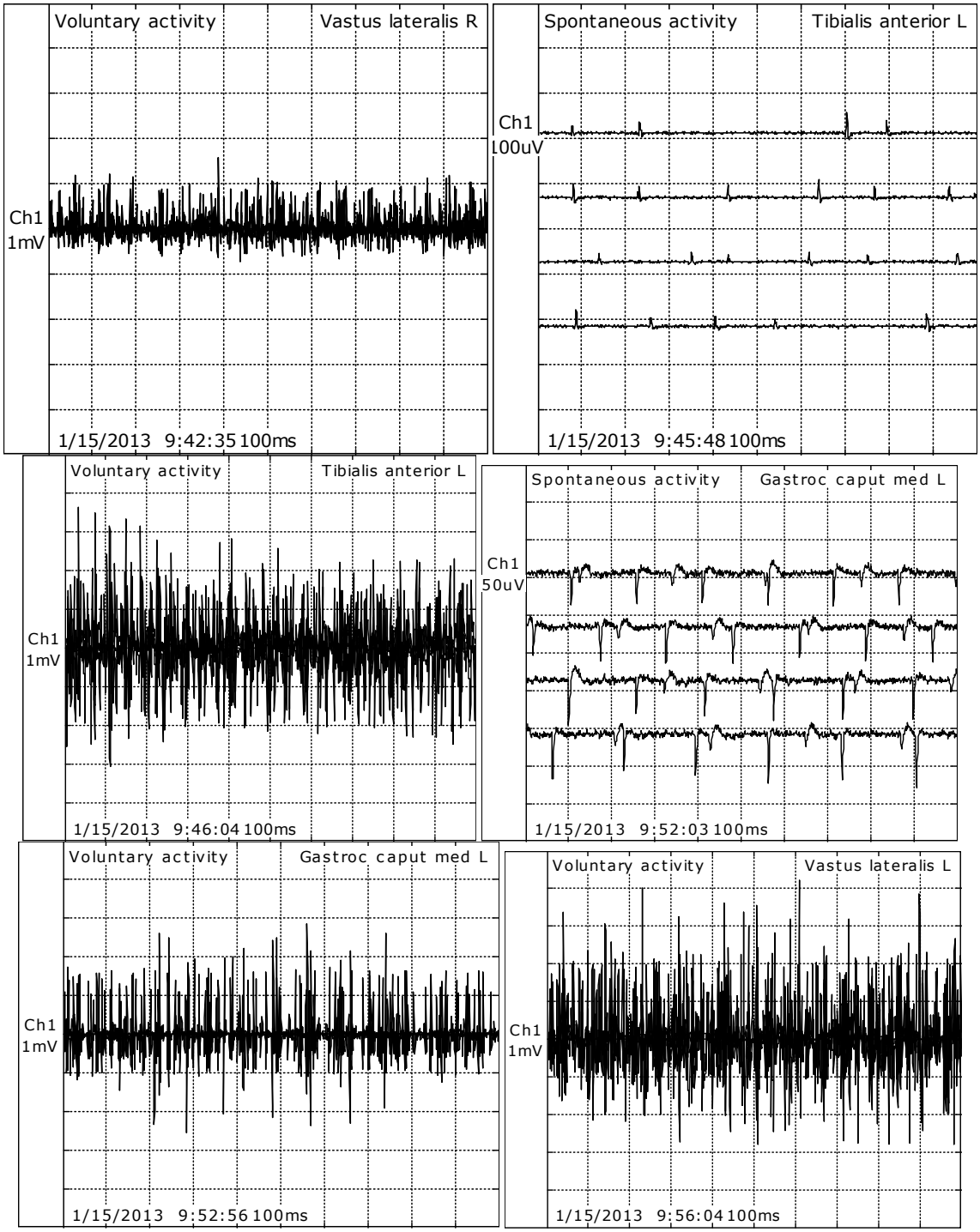
MUP	n°	Durate	Amplitude	Area	Phases	Turns	Rise time
		ms	uV	uVms			us
Tibialis anterior R	**1**	13.9	617.1	1600.0	3	3	2100.0
	2	11.1	454.2	1000.0	2	2	3100.0
	3	14.5	953.4	1500.0	6	8	1000.0
	4	11.4	410.7	1000.0	2	2	2200.0
	5	15.4	1900.0	3900.0	2	3	1300.0
Mean values		13.3	867.1	1800.0	(0% poly.)		
Tibialis anterior L	**1**	10.5	477.3	921.3	1	3	4300.0
	2	13.3	1800.0	2800.0	3	8	1400.0
	3	10.4	995.4	2000.0	4	6	1500.0
Mean values		11.4	1090.9	1907.1	(0% poly.)		
Gastroc caput med L	**1**	11.5	1200.0	2200.0	3	3	1500.0
	2	8.2	313.2	627.9	2	2	2000.0
	3	9.8	523.9	967.3	2	2	2000.0
Mean values		9.83	679.0	1265.1	(0% poly.)		
Vastus lateralis L	**1**	12.4	1000.0	2100.0	3	3	1300.0
Mean values		12.4	1000.0	2100.0	(0% poly.)		
Vastus lateralis L	**1**	13.1	1000.0	2100.0	3	3	1300.0
	2	14.7	3800.0	4400.0	8	15	568

MUP	n°	Durate	Amplitude	Area	Phases	Turns	Rise time
		ms	uV	uVms			us
	3	9.3	630.0	940.7	2	2	1400.0
Mean values		12.4	1810.0	2480.2	(-1431655765% poly.)		
Abd dig min (man) R	**1**	9.5	2100.0	2600.0	3	3	1600.0
	2	19.1	3300.0	7700.0	4	6	1500.0
Mean values		14.3	2700.0	5150.0	(0% poly.)		
Biceps R	**1**	16.5	2200.0	5300.0	3	3	2300.0
	2	18.2	206.6	738.7	2	2	3600.0
Mean values		17.4	1203.3	3019.4	(0% poly.)		

Figure 1. Results




Motor NCV
Peroneus R
Ch1
5mV
maleolla lat
100mA
fibulla
100mA
1/15/2013 9:18:51 5ms
Motor NCV
Peroneus L
Ch1
5mV
maleolla lat
100mA
fibulla
100mA
1/15/2013 9:21:20 5ms
Sensory NCV
Suralis R
Ch1
20uV
Leg
30mA
1/15/2013 9:26:30 2ms
Sensory NCV
Suralis L
Ch1
20uV
Leg
30mA
1/15/2013 9:28:40 2ms
Spontaneous activity
Tibialis anterior R
Ch1
100uV
1/15/2013 9:34:10 100ms
Voluntary activity
Tibialis anterior R
Ch1
1mV
1/15/2013 9:35:42 100ms


Voluntary activity
Vastus lateralis R
Ch1
1mV
1/15/2013 9:42:35 100ms
Spontaneous activity
Tibialis anterior L
Ch1
100uV
1/15/2013 9:45:48 100ms
Voluntary activity
Tibialis anterior L
Ch1
1mV
1/15/2013 9:46:04 100ms
Spontaneous activity
Gastroc caput med L
Ch1
50uV
1/15/2013 9:52:03 100ms
Voluntary activity
Gastroc caput med L
Ch1
1mV
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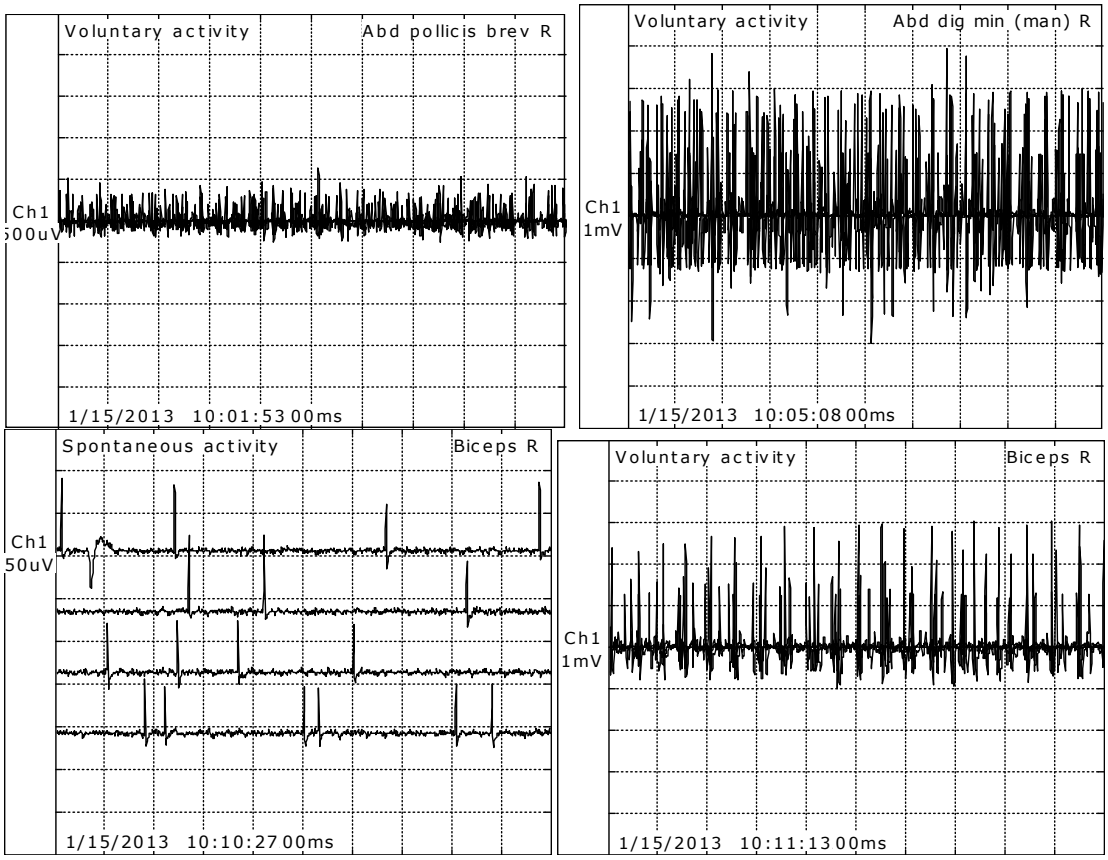
Voluntary activity
Vastus lateralis L
Ch1
1mV
1/15/2013 9:56:04 100ms



VCM:
Nerves median, ulnar dr, peronier bilateral – with amplitude CMAP decrease, VCM normal.

VCS:
Nerves median, ulnar dr, sural bilat – with amplitude SNAP and VCS normal.

EMG with needle:
At the level of muscle examined we observe pathological spontaneous activity (PSW ++, little fibrillation).

Recutare pattern poor. PUM with duration and amplitude increased.
We begin a neuromotor and physiologic rehabilitation. Rehabilitation programme objectives: induce of voluntar motor activity; prevent wrong movement; prevent muscle retractures and joints diformities, decrease spasticity. Rehabilitation programme: we used physical programme for reduce pain, spasticity ALMEIDA (2012), ASHWORTH (2012), BALDINGER (2012) and also kinetic method for each objective. In each month we followed the evolution using specific scale assessment.

Conclusions
It is important if the symptoms are not clear and the results of immunology are not complete to not begin treatment for borreliosis and the interdisciplinary consult is necessary to complete the diagnosis. After antibiotic treatment we observe that clinical sign worst.

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RECOVERY OF CEREBELLAR DISORDERS IN THE ELDERLY

DOCU AXELERADANY[1], DOCU AXELERAD DANIEL[2]

Abstract

Aim.Maintaining a safe perambulation and autonomy in activities of daily life are main objectives for chronic cerebellar disorders Cerebellar function is usually affected through several mechanisms, which often combine reduced blood flow, edema, mechanical compression and invasion of cerebellar parenchyma, inflammatory response, immune process, cytotoxic effect and neuro degeneration. Brainstem and meninges are also affected. In our patients lateral focal cerebellar lesions induce ipsilateral signs, although expanding lesions may produce a false localization of clinical signs. Cerebellar symptoms are influenced more by location and rate of progression of the disease than the pathological characteristics .Ataxia is a term originally used to describe disequilibrium in tables and is currently applied to describe the jerky or irregular character of movement or posture, when a disorder of coordination cannot be explained by strength or sensation deficits.The most common causes of ataxia in the elderly are stroke, trauma, infections, cerebellar multiple system atrophy, spinocerebellar ataxia (SCA), fragile X-associated tremor/ataxia syndrome (FXTAS), metastases, paraneoplastic diseases, multiple system atrophy (MSA).

Methods: we study 30 patients with ataxia in elderly patients all of them secondary to a cerebellar stroke, for a period of one year (15.01.2011-15.01.2012), 15 patients were medical treated and 15 patients were medical treated and we initiate a recovery program.

Results. For ataxic patients, the recommendation is daily (if possible) rehabilitation with postural training, even if results of large studies on the beneficial effect are still awaited.

Conclusion. Patients participating in daily motor rehabilitation show a less abrupt deterioration after cerebellar stroke.

Key words: elderly, stroke, ataxia.

Introduction

Cerebellar function is usually affected through several mechanisms, which often combine (Holmes (1917): reduced blood flow, edema, mechanical compression, and invasion of cerebellar parenchyma, inflammatory response, immune process, cytotoxic effect and neuro-degeneration Fisher (1977). Brainstem and meninges are also affected. In our patients lateral focal cerebellar lesions induce ipsilateral signs, although expanding lesions may produce a false localization of clinical signs Amarenco (1995).

Cerebellar infarction accounts for about 3% to 4% of strokes. A majority of cerebellar strokes are ischaemic (80%). Given the arterial distribution the simultaneous involvement of the cerebellum and the brainstem is frequent. Macdonnel, Kalnins, Donnan (1987)

The Cerebellum ensures the co-ordination of movements, regulates the muscle tone and equilibrium of the body.

1. Ataxia.
2. Dysmetria
3. Adiadocokinesia.
4. Asynetgy.
5. Intentional Tremor.

6 Hypotony.

ATAXIA: Disturbance of coordination.

DYSMETRIA: Trouble of measuring distance. It can be evidenced by following tests:

1. Finger -Nose Test.(hypometria if stops before nose or Hypermetria if stops after the nose)
2. Heel -Knee Test.
3. Grigorescu or Bottle Test.
4. Test of Horizontal Lines.

ADIADOCOKINESIA: - Trouble of successive movements.It can be evidenced by the following tests:

1. Test of Pronation - Supination of hands.

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2. Test of Flexion - Extension of hands.
3. Test of rotation of one finger around the other.
4. Windmill Test.

ASYNERGY: Trouble of synergy , of contraction of different muscles. It is evidenced by following tests:

1. Rising from bed.
2. Test of walking or gait. (Typical gait resembling that of a drunkard).
3. Test of pushing the patient.(Falls on push.)

INTENTIONAL TREMOR: Tremor that appear at the active movement. Due to this the speech becomes dysoriented and sounds are unequal. The writing is macrographic with unequal size of letters.

HYPOTONY: Patient has diminished muscular tonus. Amplitude of passive movements of joints is increased. Doe to hypotony the Rotulian Reflex is pendullum type.

Diagnosis of cerebellar stroke: techniques and ancillary tests used are MRI, MRA, CT scan, ultrasound imaging, single – photon emission CT, blood studies, cardiac investigations, lumbar puncture in selected cases.

Objective: maintaining a safe deambulation and autonomy in activities of daily life are main objectives for chronic cerebellar disorders.

Methods

We studied 30 patients with ataxia in elderly patients all of them secondary to a cerebellar stroke, for a period of one year (15.01.2011-15.01.2012), 15 patients were medical treated and 15 patients were medical treated and we initiate a recovery program. All patients included were older than 65 years. The majority of measurement scales used to evaluate outcome in rehabilitation are ordinal in nature and consequently statistically valid assessments of change are difficult to make. All our patients were investigated performing functional staging for ataxia Dobkin (2003). Inclusion criteria were a primary indication for admission for inpatient rehabilitation of first cerebellar hemorrhage or cerebellar infarction (with and without secondary hemorrhagic change

Results

Rehabilitation with postural training, if possible on daily basis, is recommended in ataxic patients, although we are still missing large studies confirming a beneficial effect. Clinical features at the time of acute hospitalization were recorded from referral information and categorized as (1) vertigo/ ataxia without other deficits, (2) altered level of consciousness with or without other symptoms, (3) hemiparesis with or without other symptoms, or (4) other syndrome. All patient performed, CT or MRI scans at admission.

After performing functional staging for ataxia (10) result displayed in Table 1:

Table 1. Functional staging for ataxia

Nr.patients	N%	Stage0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Total	30	0(0%)	3(10%)	4(13.4%)	15(50%)	6(20%)	2(6.65%)	0(0%)
Male	22(73.3%)	0(0%)	2(9.1%)	3(13.6%)	12(54.5%)	4(18.1%)	1(4.5%)	0(0%)
Female	8(6.4%)	0(0%)	1(12.5%)	1(12.5%)	3 (37.5%)	2(25%)	1(12.5%)	0(0%)

After this scale we saw that 10% of patients are in stage 1, 13.4% in stage 2, 50% in stage 3, 20% in stage 4 and 6.65% stage 5. Assistive therapy improves the autonomy of patients. For patients with moderate disability we utilized recovery methods and between them we used an orthotics devise to stabilize joints. For patients mild disability we perform with physical and occupational therapies to reinforce muscle activity and maximize functional capacities.

Baseline characteristics of the study are displayed in Table 2. Thirty cases were identified that fulfilled inclusion criteria (17 men, 13 women; 22 infarcts, 8 hemorrhages).

Table 2. Baseline Characteristics of Study

	All (n=30)	Infarcts (n=22)	Hemorrhages (n=8)
Sex n (%)			
Male	17 (56.6%)	12 (54.5%)	5 (62.5)
Female	13 (43.4%)	10 (45.5%)	3 (37.5)

Age group repartition is displayed in Table 3:

Table 3. Baseline Characteristics of Study

	65 - 70	71 - 80	81 - 90
Sex n (%)			
Male	11 (64.7%)	4 (22.3%)	2 (11.1%)
Female	10 (76.9%)	2 (15.3%)	1 (7.69%)

Initial clinical syndromes at the time of presentation to the acute-care hospital were classified into 4 categories based on their anticipated effect on functional outcome (Table 4).

Table 4. Clinical Characteristics of Study

	All (n=30)	Infarcts (n=22)	Hemorrhages (n=9)
Presenting clinical syndrome, n (%)			
Vertigo/ataxia alone	23(76.6%)	19(86.3%)	4(44.4%)
Hemiparesis+/− other symptoms	3(10%)	1(4.5%)	2(22.2%)
Altered level of consciousness	0	1(4.5%)	1(11.1%)
Other syndrome	3(10%)	1(4.5%)	2(22.2%)
Acute treatment, n (%)			
Medical treatment only	15 (50%)	10 (66.6%)	5(33.4%)
Medical and recovery	15 (50%)	14 (93.3%)	1 (6.7%)

All patients underwent neuroimaging: 17 (56.6%) by CT and 13 (43.4%) by MRI.

Overall, we found that most patients in the group were moderately disabled at the time of admission to inpatient rehabilitation, attained functional score of ataxia consistent with functional independence by the time of discharge, and continued to functionally improve after discharge.

Compared with patients with cerebellar infarction, those with cerebellar hemorrhage had greater degrees of functional impairment at admission and at discharge from inpatient rehabilitation, most of which was attributable to greater impairment in items measured by the functional score of ataxia.

We found strong correlations between outcome and functional status at the start of rehabilitation therapy and preexisting comorbid conditions. Perhaps less expected.

The positive correlation between outcome and the presenting syndrome of vertigo/ ataxia likely reflects isolated cerebellar involvement without brain stem infarction or significant mass effect. Conversely, the strong inverse correlation between outcome and altered level of consciousness at presentation is probably related to early hydrocephalus and/or brain stem compression associated with larger cerebellar strokes. This finding is consistent with other studies that have reported that reduced level of consciousness at initial presentation is strongly correlated with poor outcome Jauss, Krieger, Hornig, Schramm, Busse (1999), Manto (2010).

Flexion/extension movements: all the patients started the movement in a position where the elbow was on the table and the forearm in the vertical position. The movement was done in regular rhythm give by the kinetotherapist. We recorded 20 flexion/extension movements. 7 from 15 patients can perform this task. We recorded the time performing the task and we observe that after two weeks they became 10-20 secunde faster.

Progressive resistance exercises performed three to four times weekly for a period of from 14 weeks by our patients with adequate motor control improved strength and functional activities.

After this exercise we observe that after one year evaluation a considerable improvement in the patients who performed recovery exercise (Table 5)

Table 5. After one year end with recovery program

No. patients	Number of patients	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Total	15(initial)	0	3	2	5	3	2	0
RECOVERY PROGRAM	After one year	0	7	5	3	0	0	0

Patients without recovery program (Table 6) there not are significant differences from the beginning of the disease

Table 6. After one year without recovery program

No. patients	Number of patients	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Total	15(initial)	0	3	2	5	3	2	0
Medical treatment	After one year	0	3	3	4	4	1	0

Discusses

For the whole study, comparing results from beginning with results after one year of treatment we admit working hypothesis because we found t = 4.130 p <.001, which means that we have a more than 99.99% confidence that the difference found is not accidental but is due to treatment.

After comparing the two ways of treatment after one year, working hypothesis because we found t = -4.298 p = .001, which means that we have a 99.99% confidence that the differences found are not due to chance but to the use of recovery treatment on the first group of patients (the experimental group).

Applying the same assumptions, we use a different method of comparing results, to be confident, because the sample is small and having doubts about the normality randomisation pooling and distribution, weaver and a nonparametric test (Wilcoxon for related samples). The result is similar, admit working hypothesis because we found Z = -3.066 p = .002, which means that we have 99.98% confidence that the results are not random but due to recovery treatment.

We observe that preexisting conditions such as painful osteoarthritis or cardiopulmonary disease may limit exercise tolerance in our patients 1 patient has painful osteoarthritis who limits flexion/extension movements and 1 has cardiopulmonary disease who limits resistance exercises.

Our study has certain limitations that must be bore in mind when interpreting these results. In particular, our findings may not be generalized to all patients with cerebellar stroke but are likely to be representative of recovery only in that subset of patients who undergo inpatient rehabilitation therapy. This study has several advantages because we measured functional impairment and recovery, which is of greater relevance to the patient. Second, use of functional ataxia staging that is easy to use and very clear. Third, we describe new information predictors of postrehabilitation and long-term outcome at elderly patients, which may be of practical utility in determining prognosis at the time of acute presentation. Fourth, preexisting comorbid conditions were taken into account in the analysis for final prognosis.

Depression is especially prevalent, affecting 25 to 40 percent of patients within the first year after a stroke. Eriksson, Asplund, Glader et al. (2004). Guidelines of the American Heart Association and the Royal College of Physicians WADE DT (2002) recommend the long-term use of aerobic training; exercises to enhance flexibility, balance, and coordination; and resistance exercises within daily activities for patients after a stroke.

Conclusions

Patients participating in daily motor rehabilitation show a less abrupt deterioration after cerebellar stroke. Physical and occupational therapies should attempt to reinforce muscle activity and maximize functional capacities. Passive movements under various condition of inertia might improve coordination. Patients who are wheelchair-bound or confined to beds should receive specific care to prevent complication such as pressure sores. These data confirm and extend previous reports indicating that excellent functional recovery frequently occurs among survivors of cerebellar infarction. These data will improve determination of prognosis in the acute stage and may help refine strategies for rehabilitation therapy. Most of the time rehabilitation in old person is usually not accepted but our study try to show that the rehabilitees process it is nonage depending. The results indicate that there can be substantial benefit from organized inpatient multidisciplinary rehabilitation in the postacute period; even they are more than 65 years old.

At present, the opportunity to achieve maximal improvement is probably constrained by a lack of adequate data to define the optimal intensity (performance time, pace, and duration) of training strategies for cerebellar stroke.

Refereces

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STUDY ON THE ROLE OF KINETIC THERAPY IN THE TREATEMENT AND PROFILAXIS OF DIABETES

FIEROIU EMIL[1]

Abstract
Research goals:
- to establish which are the optimum exercises to be used in the kinetic programme used in compliance with the patients state (gradation, etiopathogenic context, levels of blood sugar);
- to establish the dos and don'ts in applying the kinetic programme as part of the patient's overall treatment (medication, physical, kinetic) of the patient;
- to establish the optimum number of sessions in a treatment programme;
- to establish the optimum period of using this therapy after which the patient's symptoms will improve;
- to elaborate a kinetic program which the patient could follow and do in their day-to-day life at home or at the workplace.
Methods
Reading the literature
Interviews
Observation
Tests
Trials
Results
Our research has been carried out with the help of 10 volunteers, aged between 32 and 58, with an average age of 45. By studying these cases we have come to know their condition and to understand the way in which the proposed kinetic exercises could be performed. In order to evaluate a patient with diabetes we had to get a full history from the patients, a physical exam and a set of laboratory analyses.
We evaluated:
- The sensation of fatigue felt by the patients
- Dizziness suffered by diabetics
- Insulin level

The state of the patients' health was evaluated by analysing the results obtained concerning the level of fatigue, dizziness, blood sugar level and weight.

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We agreed that physical exercise should be part of the daily routine of the patient and the secure interval of blood sugar for physical exercise is between 100 and 250 mg/dL.
Conclusions
Early use of kinetic therapy through the regular practice of physical exercise is a good prophylactic method for diabetics and it could also lower the risk of developing the disease.
Using kinetic exercises by overweight people keeps their blood sugar in check and the can lose weight. The loss of weight together with the physical exercise prevents the onset of type 2 diabetes in overweight people and quite often helps regulate blood sugar without any medication.
In conclusion, healthy people as well as diabetics can benefit from regular physical activity in order to maintain their weight within reasonable limits, help the body adequately assimilate sugar in the blood which will be efficiently used in the cells and tissues.
Key terms: diabetes, kinetic programme, insulin, physical exercise.

Introduction

Diabetes is a consequence of partial or total absence of secreted insulin which leads to an increase in blood sugar, which causes metabolic unbalances of blood fat, proteins and electrolytes and which in time develops severe micro and macroangiopathic complications. (Dumitrescu, 2003)

Diabetes included a set of metabolic diseases characterised by hyperglycemia (increase in blood sugar) which results in improper insulin secretion, insufficient action of insulin or of both. Pathological changes of carbohydrate metabolism (sugar) causes unbalances in lipid metabolism (fat) as well as proteins. (Clavell, 2003). One of the therapies used to prevent this is physical exercise, which is known to lower blood sugar.

The beneficial effects of physical exercise in the case of diabetes have been largely acknowledged by physicians since the eighteenth century. After the discovery of insulin, an appropriate carbohydrate diet and physical exercise were the other two elements in treating diabetes. At present, diabetics are instructed to take up physical exercise, which is also recommended in specialised publications. (Mogos, 1990)

Research objectives:

- to establish which are the optimum exercises to be used in the kinetic programme used in compliance with the patients state (gradation, etiopathogenic context, levels of blood sugar);
- to establish the dos and don'ts in applying the kinetic programme as part of the patient's overall treatment (medication, physical, kinetic) of the patient;
- to establish the optimum number of sessions in a treatment programme;
- to establish the optimum period of using this therapy after which the patient's symptoms will improve;
- to elaborate a kinetic program which the patient could follow and do in their day-to-day life at home or at the workplace.

Research methods

1. Establishing the optimum physical exercises for the kinetic programme by considering the phases and the evaluation of the patients' state of health.
2. Establishing the number of repetitions, sets and the duration of the recovery programme.
3. Studying medical literature on the causes of diabetes
4. Studying references and research methodology in preventing diabetes-induced damage and finding evaluating tools which could be used in kinetic programmes.

Methods

-Reading the literature;
-Interviews;
-Observation;
-Tests;
-Trials;
-Results;
-Hypothesis.

This study proposes to demonstrate that the proposed kinetic programme contributes to regulating blood insulin levels and optimising the quality of life of the diabetic patient.

Results

Our research has been carried out with the help of 10 volunteers, aged between 32 and 58, with an average age of 45. By studying these cases we have come to know their condition and to understand the way in which the proposed kinetic exercises could be performed.

Tabel nr. 1. Members of experimental group

Nr.	Name and Surname	Gender	Age	Profession	Clinical diagnosis

1	D.A.	M	58	consultant	Type 2 diabetes
2	C.A.	F	47	accountant	Type 2 diabetes
3	P.C.	F	34	tailor	Type 2 diabetes
4	G.M.	F	32	driver	Type 2 diabetes
5	J.D.	F	38	teacher	Type 2 diabetes
6	L.F	F	53	engineer	Type 2 diabetes
7	P.H.	F	44	teacher	Type 2 diabetes
8	T.S.	M	47	owner	Type 2 diabetes
9	R.I.	M	42	labourer	Type 2 diabetes
10	C.R.	M	53	driver	Type 2 diabetes

Evaluating the diabetic patients included a full medical history, a full body exam, remarking on the modification that diabetes has on the body, as well as a full set of medical tests.
We evaluated:

- fatigue felt by patients
- diabetes-induced dizziness
- insulin levels
- weight loss

1. The first testing parameter is fatigue

We have evaluated it on a scale of:
- light fatigue – 1
- medium fatigue – 2
- severe fatigue – 3

We obtained the following results:
Upon initial tests 5 patients from the experimental group complained of a degree of fatigue of 2 and the remaining 5 of a degree of 3.

Patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Initial results	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**3**
Final results	**0**	**2**	**1**	**1**	**1**	**2**	**1**	**1**	**1**	**2**

We obtained the following results:

- 6 cases with a degree of fatigue of 1
- 3 cases with a degree of fatigue of 2
- 1 case of 0 fatigue

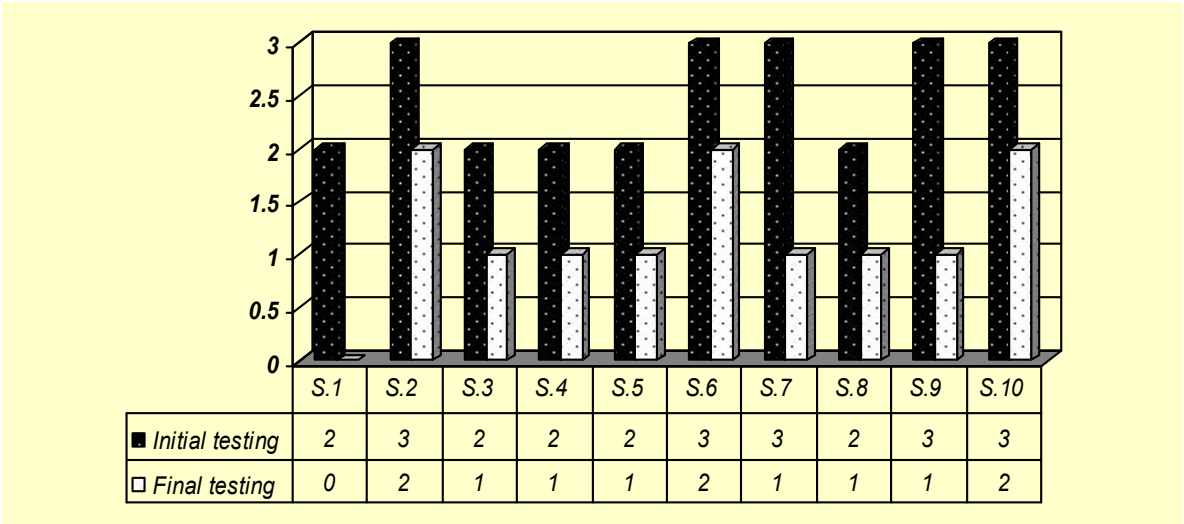

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Chart .1. – Comparative analysis of results of fatigue

2. The second parameter in testing the experimental group was the degree of fatigue in patients with diabetes and hypertension. This was done through an evaluation of fatigue on a scale of:

- Light fatigue – 1
- Acute fatigue – 2

We obtained the following results:

6 patients from the experimental group reported a high threshold of dizziness and 4 patients complained of light fatigue.

Subject	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Initial result	**1 degree**	**1 degree**	**1 degree**	**2 degrees**	**2 degrees**	**2 degrees**	**2 degrees**	**2 degrees**	**1 degree**	**1 degree**
Final result	**1 degree**	**0**	**1 degree**	**1 degree**	**1 degree**	**1 degree**	**1 degree**	**1 degree**	**0**	**1 degree**

The following results were obtained after the final test:

- 2 cases reported a level of dizziness of 0
- 8 cases reported a level of dizziness of 1

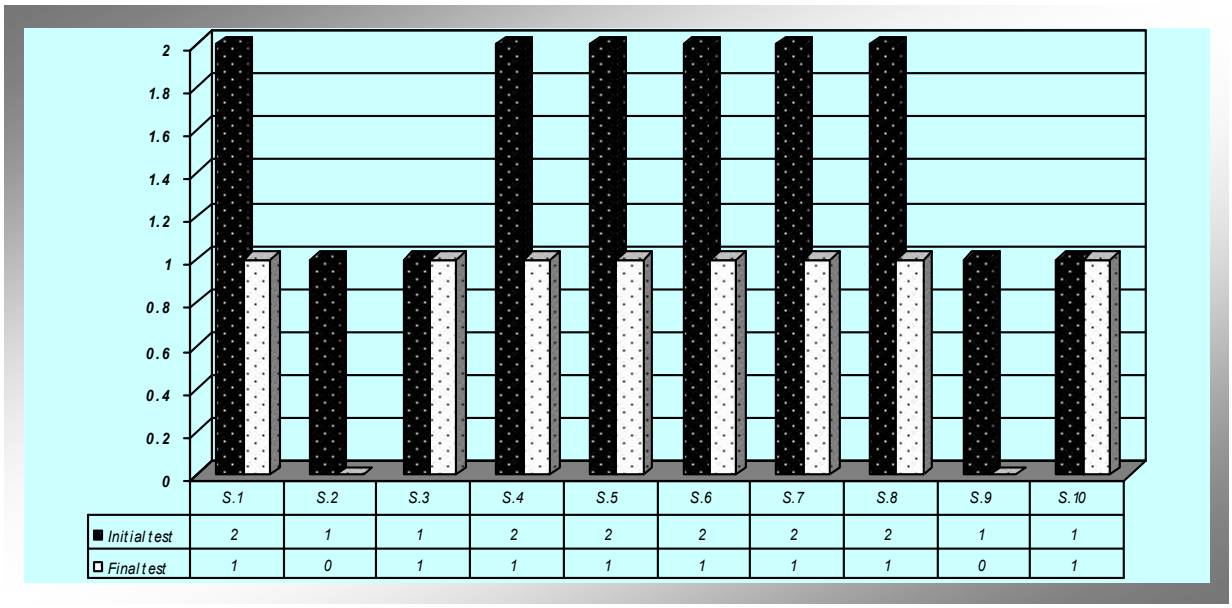

Chart.2. – Comparative analysis of results for dizziness levels

3. **Concerning the level of blood sugar** after finishing the kinetic programme, we obtained the following results:

Patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Initial result	230 mg%	280 mg%	340 mg%	260 mg%	321 mg%	190 mg%	297 mg%	249 mg%	367 mg%	278 mg%
Final result	181 mg%	157 mg%	211 mg%	150 mg%	198 mg%	120 mg%	210 mg%	141 mg%	230 mg%	135 mg%
Difference Initial test	49 mg%	123 mg%	129 mg%	110 mg%	123 mg%	70 mg%	87 mg%	195 mg%	137 mg%	143 mg%

The results were:

- Patient 1 had a drop of 49 units in blood sugar levels
- Patient 2 had a drop of 123 units in blood sugar levels
- Patient 3 had a drop of 129 units in blood sugar levels
- Patient 4 had a drop of 110 units in blood sugar levels

- Patient 5 had a drop of 123 units in blood sugar levels
- Patient 6 had a drop of 70 units in blood sugar levels
- Patient 7 had a drop of 87 units in blood sugar levels
- Patient 8 had a drop of 195 units in blood sugar levels
- Patient 9 had a drop of 137 units in blood sugar levels
- Patient 10 had a drop of 143 units in blood sugar levels

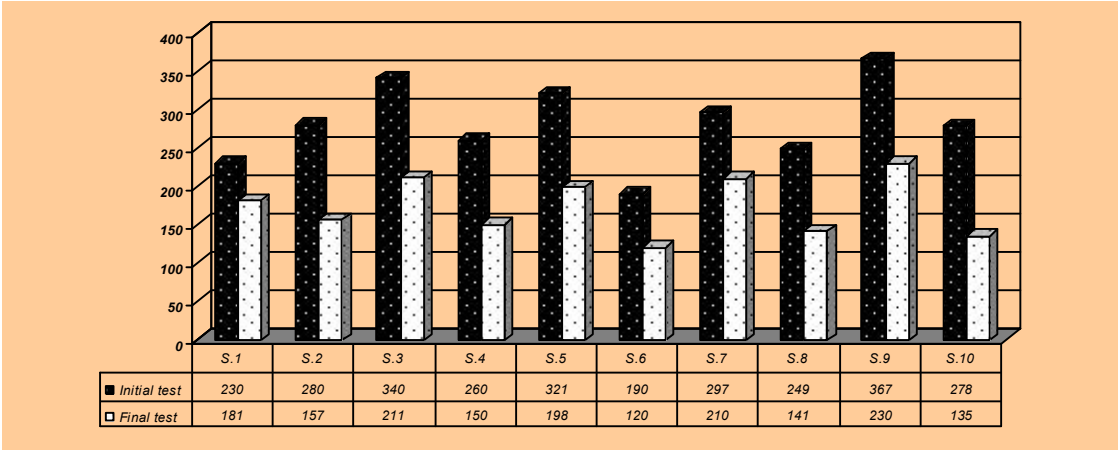

Chart.3. – Comparative analysis of blood sugar results

4. Weight loss after finishing the kinetic programme

Patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Initial weight	**97kg**	111kg	89kg	98kg	88kg	75kg	93kg	102kg	107kg	90kg
Final weight	**92kg**	99kg	84kg	89kg	77kg	72kg	90kg	95kg	100kg	83kg

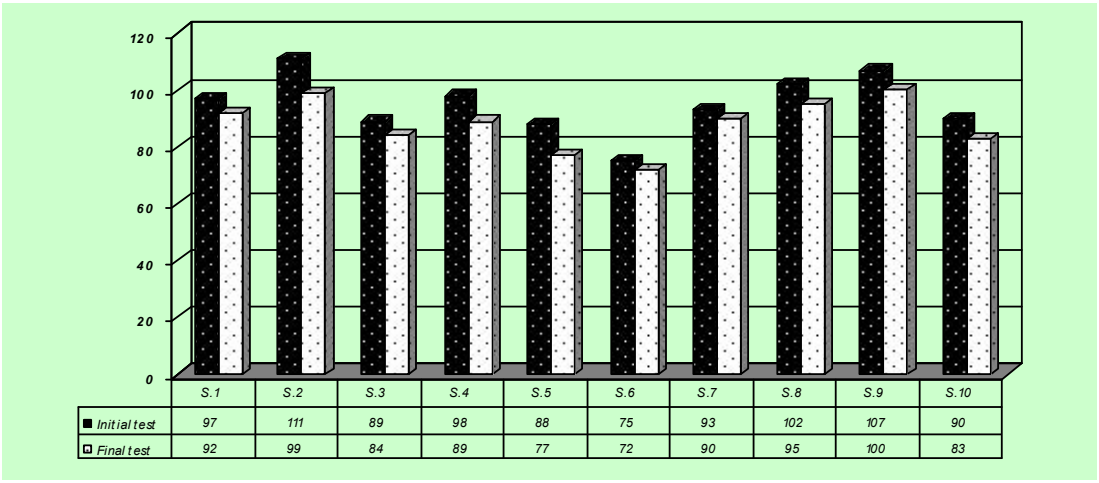

Chart.3. – Comparative analysis of results of bodyweight evaluation

Discussions

In his doctoral thesis entitled" Răspunsul imun şi metabolic în relaţie cu exerciţiul fizic**"** (Immune *and metabolic response in connection with physical exercise*), Chireac (2012) carried out a similar study concerning the influence of physical exercise on glycemic index. The first testing carried out on the experimental sample showed a total glycemia of 91.66 and after applying the physical exercises program, a reduction in glycemia values of 74.05 was seen.

Douglas (2012) carried out a study on the relation between physical effort and diabetes mellitus, stating that by making aerobe and anaerobe types of physical effort, a positive outcome in terms of reduction and normalization of glycemia in all the persons who practice physical exercise on a regular basis will be obtained.

The general state of health of the experimental group was evaluated by analysing the results obtained

concerning the level of fatigue, dizziness, blood sugar level and weight.
We agreed that physical exercise should be part of the daily routine of the patient and the secure interval of blood sugar for physical exercise is between 100 and 250 mg/dL.
After finishing the proposed kinetic programme, at the final testing, it was found that in 6 cases the level of fatigue was 1, in 3 cases it was 2 and in only one case the was none at all.
Concerning the level of dizziness, we have obtained the following results: 8 cases reported a level of 1 and only 2 cases no longer had this symptom.
Concerning the level of blood sugar, the average between initial and final test levels was 116 mg/dL which confirms the fact that the kinetic programme used has had beneficial effects on the health of the patients. After finishing the kinetic programme, the patients had lost in average 6,8 kg.

Conclusions

In current society, untreated diabetes represents one of the main causes of blindness, renal failure or amputation of lower limbs.
Also, conditions associated with diabetes such as high blood pressure or dyslipidemia represents risks of cardiovascular diseases.
The level of fatigue was lowered through kinetic programmes, in all patients at all times of evaluation, with a significantly low level in the experimental group.
The kinetic programme has had positive results in reducing dizziness as well as blood sugar levels and improving the state of health.
Through these results we have managed to underline the role of the kinetic therapist in evaluating and treating the effects of diabetes in order to establish the kinetic objectives, methods and means within the complex health recovery programme.
The early use of kinetic therapy through regular physical exercise is a good method to treat diabetes and to reduce the risk of developing such a condition.
Using kinetic exercises by overweight people keeps their blood sugar in check and the can lose weight. The loss of weight together with the physical exercise prevents the onset of type 2 diabetes in overweight people and quite often helps regulate blood sugar without any medication.
In conclusion, healthy people as well as diabetics can benefit from regular physical activity in order to maintain their weight within reasonable limits, help the body adequately assimilate sugar in the blood which will be efficiently used in the cells and tissues.

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KINETIC THERAPY IN THE TREATMENT OF CERVICAL DISCOGENIC PAIN SYNDROME

FIEROIU EMIL[1]

Abstract

Purpose.Cervical discogenic pain syndrome is a disease of the arthrosis localised in the cervical segment of the spine, charaterised by pain which limits mobility and causes discomfort.
Methods.For this purpose, we have identified two clinical cases of cervical discogenic pain syndrome who accepted to use the specific recovery programme and also we have elaborated a set of methods of recovery from this syndrome.
The main therapeutic methods we used in the recovery process from this syndrome are: medical, kinetic, balneo-physical.
Results.For every case of cervical discogenic pain syndrome, it is necessary to establish an individual treatment plan which is to be discussed in detail with the patient. The diagnosis and the therapeutic options must be specified, as well as the time necessary for the therapeutic effect to appear, the spectre of adverse reactions, monitoring them, the cost of therapy as well as the patients preferences.
Kinetic therapy consists in a series of movements, physical exercises, vertical positions which lead to an improvement of the two studies.
*Conclusions.*Following the research we undertook and the analysis of the results of the experiment in the two clinical

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studies and the use of initial and final testing, we can state that the hypotheses initially stated have been confirmed. We support this with the following conclusions:
The patients have consciously and actively taken part in the proposed kinetic programme and have managed to correctly understand the proposed exercises and to easily do them.
Key words: kinetic therapy, cervical discogenic pain syndrome, pain, mobility, inflammation.

Introduction

Cervical discogenic pain syndrome is a disease of the arthrosis localised in the cervical segment of the spine, charaterised by pain which limits mobility and causes disconfort (Cotman, 2006)

Cervical pain is often due to degenerative diseases of intervertebral discs and posterior tubercles of traverse process and the hypertrophy of the apophyses at a vertebral level.

Pain irradiates locally or at a distance and leads to contraction of skeletal muscles, which itself could produce pain over time and the positioning of fibre locally. (Cretu, 2003)

Methods

Obiectivele cercetarii

- fighting inflammation and articular pain
- improving articular mobility
- correcting and recovering motor ability
- preventing deformations, stiffness and muscular atrophy
- maintaining functional capacity of usual movement and work;
- improving quality of life;
- slowing the evolution of articular lessions.

Research tasks

- Consulting the literature, in order to establish how new this topic is in the field of research;
- Establishing research hypotheses as well as ways of checking them.
- Selecting the two experimental cases in compliance with the purpose of the research and application of the necessary tests in order to establish their functional state;
- Structuring and applying the kinetic programme, by respecting pedagogic principles in a logical and progressive manner;
- Recording and interpreting the results;
- Completing research by drafting this study in order to highlight the effects of the kinetic programme in cases of cervical discogenic pain syndrome;
- Establishing the conclusive elements concerning the results obtained after the experiment and in applying the methods of exploration and evaluation.

Hypotheses

1. We consider that kinetic methods could be used to treat inflammation and articular pain and improve muscle force.

2. We propose that the kinetic programme has a key role in improving the functional state of persons with cervical discogenic pain syndrome.

Methodes

Reading the specialised literature

Investigation

Observation

Examination (exploration and evaluation)

Methods of exploration and evaluation used:

- scale of numerical evaluation
- scale of evaluation articular morning stiffness

Experiment

Recording, processing and graphically representing the data

Finishing the experiment

The experiment consists in applying the specific methods for the important elements as well as using certain kinetic programmes in order to:

- Treat pain and inflammation
- Improve mobility and articular stability
- Combat articular morning stiffness

For this purpose, we have identified two clinical cases of cervical discogenic pain syndrome who accepted to use the specific recovery programme and also we have elaborated a set of methods of recovery from this syndrome.

The main therapeutic methods we used in the recovery process from this syndrome are: medical, kinetic, balneo-physical.

For every case of cervical discogenic pain syndrome, it is necessary to establish an individual treatment plan which is to be discussed in detail with the patient. The diagnosis and the therapeutic options must be specified, as well as the time necessary for the therapeutic effect to appear, the spectre of adverse reactions, monitoring them, the cost of therapy as well as the patients preferences.

Educating the patient is essential in order to establish the doctor-patient relation, the kinetic therapist significantly contributes to the patients independence. Physical medicine, recovery and re-education, occupational therapy and psychology are all intended to contribute to preserving the functional integrity of the locomotor system.

Kinetic therapy and re-education are extremely important in recovering the articular function post-operation. A certain strategy is necessary in order to maintain a good state of health generally.

Results

Examining the patient suffering from cervical discogenic pain syndrome involved a detailed medical

history, a complete body check as well as highlighting any change in the spinal column, as well as possible extra-articular problems, as well as a full set of medical and imagery tests.
We have evaluated:

- The amount of pain;
- Articular mobility;
- Morning articular stiffness.

1. Establishing the amount of pain;

Establishing the amount of pain was done by using a Numerical evaluation scale which is the most used method. Patients evaluate their pain level on a scale from 0 to 5, where 0 represents "no pain" and 5 "most acute pain".
Initial pain in the first case was registered at 4 and the second case at 5, after finishing the kinetic programme supported by the medical treatment we registered a degree of 1 in the first case and a degree of 2 in the second case.

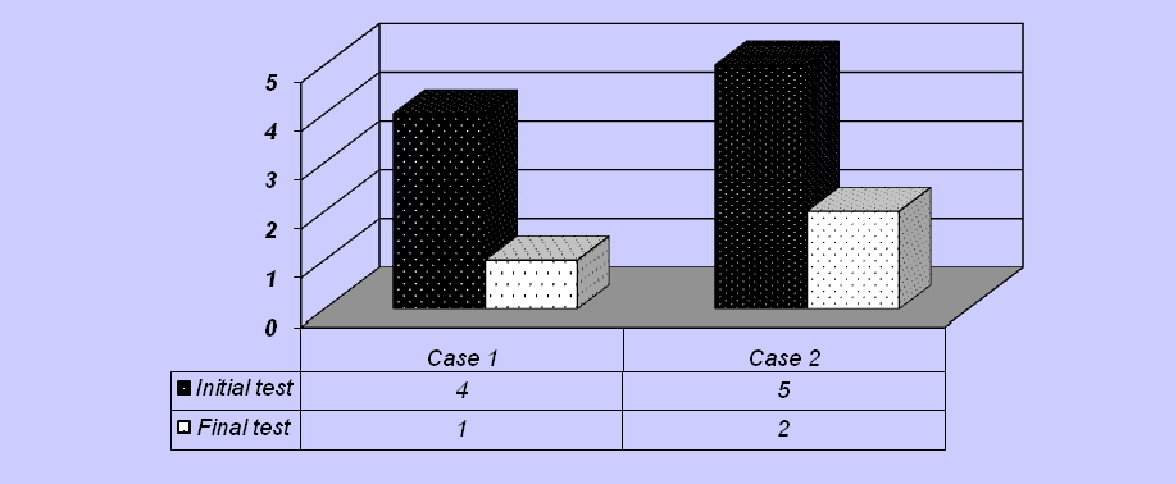

Chart. 1 – Evaluating the amount of pain

2.Articular mobility
Testing the articular mobility by using 3 tests:
The Menton - Stern Test

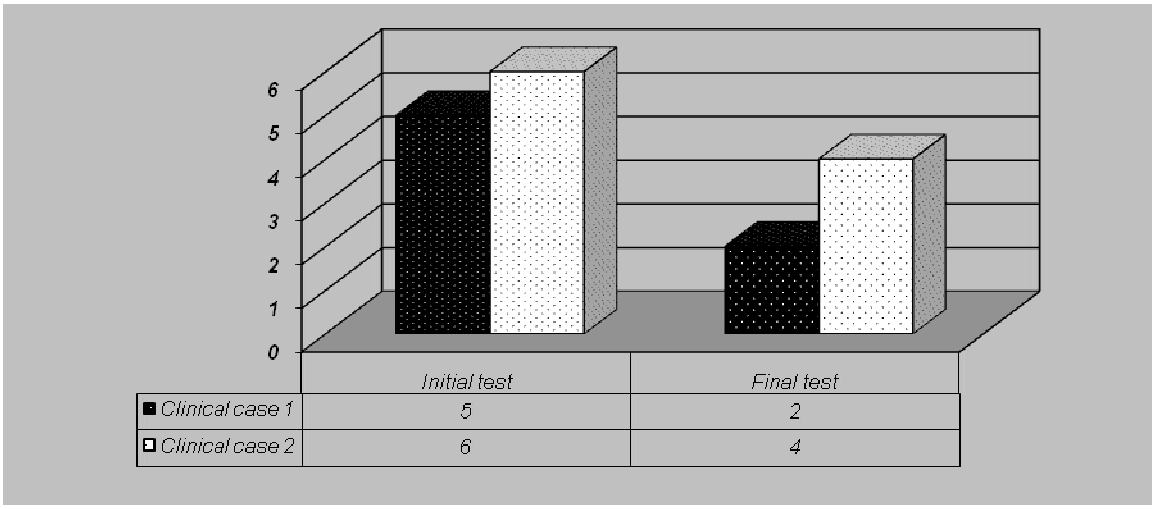

Chart. 2 – Evaluating the mobility of the cervical section of the spine

Initial testing in clinical case 1 registered a value of 5 cm while in clinical case 2 this value is 6 cm, upon final testing case one registered 3 cm while case two registered 4 cm.

The Wall Occiput Test

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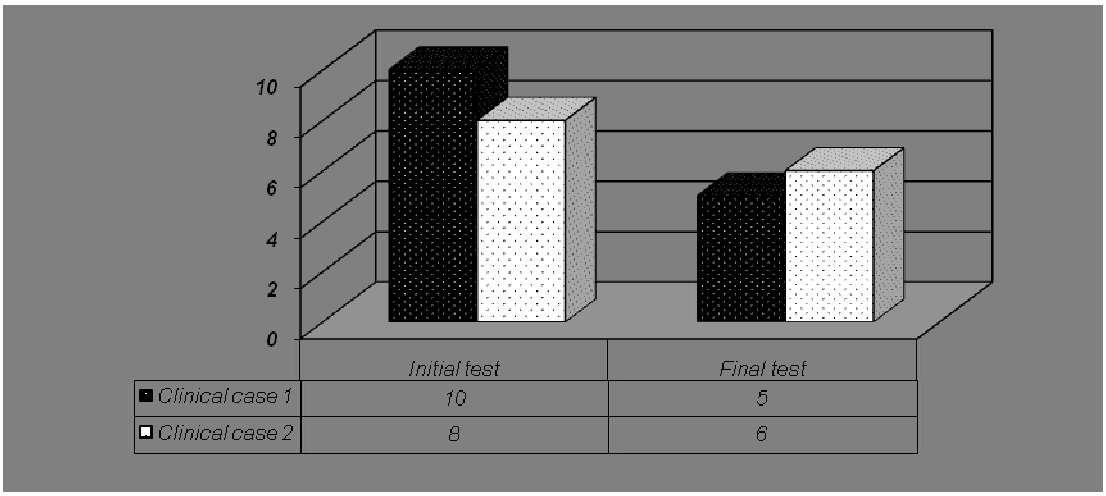

Chart. 3 – Evaluating cervical mobility in the spine

Checking the distance between the occiput and the wall, we registered a value of 10 cm in case 1 and 8 cm in case 2, upon final testing case 1 registered 5 cm while case 2 registered 6 cm.

The Tragus Test - Acromion

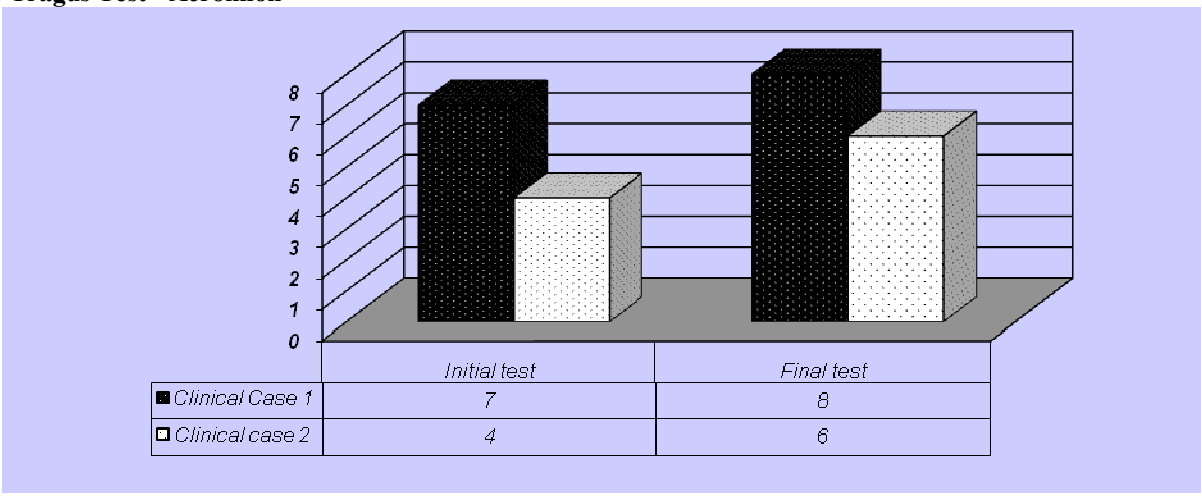

Chart. 4 – Improving cervical mobility in the spine

While testing the distance between the tragus and the acromion, case 1 initial recorded a value of 7 cm while case 2 recorded 8 cm, upon the final test case 1 registered 4 cm while case 2 registered 6 cm.

3. Articular Morning Stiffness

In order to evaluate the level of articular morning stiffness we used the Womac (Western Ontario and McMaster Universities) Likert subscale divided into 5 steps from 0 to 4.

Upon initial evaluation, case 1 was at level 3 while case 2 at level 2 and after finishing the experiment both cases registered the following progress:

- case 1 was at 1
- case 2 at 0

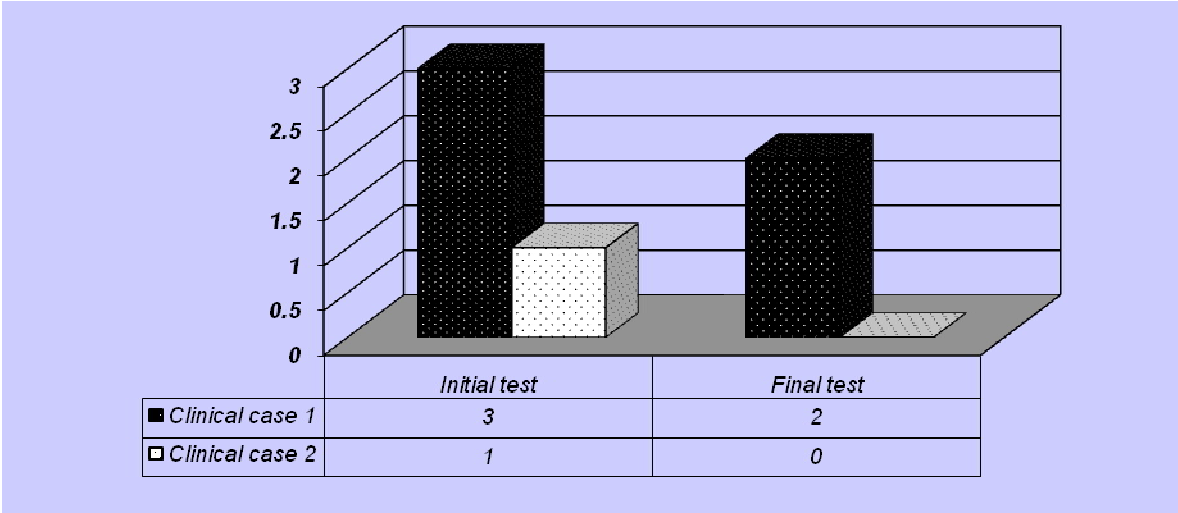

Chart 5- Distribution of stiffness in the two experimental cases

Discussions

Among other authors who have carried out researches concerning the kinesitherapy role in the recovery from algo-functional cervical syndrome was Kiss (2004); in his book „Fizio-kinetoterapia si recuperarea medicala" (*Physiokinesitherapy and medical recovery*) he carried out a study on kinesitherapy's role in the recovery from algo-functional cervical syndrome by kinetic means.

Windsor Robert also makes reference to this subject; he carried out a study in which he shows the incidence of this syndrome in his work "Cervical Discogenic Pain Syndrome", which has been published in Medscape magazine.

Reducing pain and inflammation are the two objectives which must be met to use the optimum kinetic programme.

Kinetic therapy consists in a series of movements, physical exercises, vertical positions which lead to an improvement of the two studies.

Concerning the evaluation of the amount of initial pain, case 1 registered a value of 4 while case 2 a value of 5, after finishing the kinetic programme case 1 registered a drop to 1 while case 2 experienced a drop to 2.

The kinetic programme has had a positive effect and in the case in the Menton – Stern test both clinical cases registered a value of 2 cm.

Concerning the wall occiput test, clinical case 1 registered an increase of 5 cm while clinical case 2 had 4 cm.

In initial testing of the difference between the tragus and the acromion, case 1 registered a value of 3 cm while case 2 only 2cm.

Kinetic therapy has had en effect on the level of articluar morning stiffness by reducing it to a value of 3 in case 1 and in case 2 the stiffness disappeared.

Conclusions

Following our research and the results obtained from this experiment and application of initial and final tests with our two clinical cases, we may state that our original hypotheses have been confirmed. We base this on the following conclusions:

Finishing the kinetic programme has led to treating articular morning stiffness, increasing mobility and articular stability.

Well-selected, structured kinetic exercises, which efficiently play a part in reaching our objectives, contribute to optimizing the functional state and improving the health of people with cervical discogenic pain syndrome.

The patients consciously and actively took part in the proposed kinetic programme and have managed to acquire corretly and easily execute the kinetic exercises.

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THE PNF (PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION) STRETCHING TECHNIQUE – A BRIEF REVIEW

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Abstract
The aim of this paper is to realize a brief review on the PNF stretching technique.
PNF stretching (or proprioceptive muscular facilitation) is one of the most effective forms of flexibility training for increasing range of motion. PNF stretching is a method of flexibility training that can reduce hypertonus, allowing muscles to relax and lengthen and can be applied to patients of all ages. PNF can be used to supplement daily stretching and these techniques help develop muscular strength and endurance, joint stability, mobility, neuromuscular control and coordination. PNF techniques are as follows: Contract Relax, Hold Relax, Rhythmic Initiation, Rhythmic Stabilisation, Slow reversals, Alternating isometrics and Alternating rhythmic stabilization.
Conclusion. Whether promoting flexibility, developing muscular strength and endurance, improving joint stability or increasing neuromuscular control and coordination, PNF is a valuable part of every rehabilitation program.
Key words: stretching, proprioceptive muscular facilitation, neuromuscular control and coordination.

Intoduction

PNF stretching, or proprioceptive neuromuscular facilitation, is a method of flexibility training that can reduce hypertonus, allowing muscles to relax and lengthen. PNF stands for proprioceptive muscular facilitation and it is generally considered as one the most effective forms of stretching available. (http://articles.submityourarticle.com/the-basics-and-benefits-of-pnf-stretching-83751). PNF stretching, or proprioceptive neuromuscular facilitation stretching, are stretching techniques commonly used in clinical environments to enhance both active and passive range of motion with the ultimate goal being to optimize motor performance and rehabilitation (http://en.wikipedia.org/wiki/PNF_stretching).
Generally an active PNF stretch involves a shortening contraction of the opposing muscle to place the target muscle on stretch, this is followed by an isometric contraction of the target muscle. PNF can be used to supplement daily stretching and is employed to make quick gains in range of motion to help athletes improve performance (Marek, Cramer, Fincher, Massey et al., 2005)

Proprioceptive neuromuscular facilitation (PNF) was first developed by Margaret Knott PT, and Herman Kabat MD in the 1940's to treat neurological dysfunctions.(http://www.stretching-exercises-guide.com/pnf-stretching.html).

Initial PNF techniques were used to aid the rehabilitation of clients with spasticity and weakness by facilitating muscle elongation. This is theorized to be accomplished through enhanced inhibitory mechanisms affecting the spastic muscle, and improving the muscle strength through improved excitation mechanisms in the weakened muscle. (Sharman, Cresswell, Riek, 2006). And R. Lane sustained that "PNF stretching initially developed as a form of rehabilitative therapy so as to lessen and hopefully reverse the impact of a paralysis or stroke. The effectiveness of the technique led physiotherapists and other health/sports professionals to investigate it further and apply it to other areas" (http://articles.submityourarticle.com/the-basics-and-benefits-of-pnf-stretching-83751)
PNF techniques help develop muscular strength and endurance, joint stability, mobility, neuromuscular control and coordination–all of which are aimed at improving the overall functional ability of patients (Scifers, 2004, http://physical-therapy.advanceweb.com/Article/The-Truth-About-PNF-Techniques-1.aspx).
PNF techniques have broad applications in treating people with neurologic and musculoskeletal conditions, most frequently in rehabilitating the knee, shoulder, hip and ankle (Surburg, Schrader, 1997). Stretching is a main component of PNF. In fact, PNF stretching is superior to other stretching techniques (Burke, Culligan, Holt, 2000; Funk, Swank, Mikla, et al., 2003).
PNF exercises can be applied to patients of all ages. Klein et al., 2002, found that using PNF techniques for older adults improved range of motion, isometric strength and selected physical function tasks (Klein, Stone, Phillips, et al., 2002).
Whether promoting flexibility, developing muscular strength and endurance, improving joint stability or increasing neuromuscular control and coordination, PNF is a valuable part of every rehabilitation program.

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Proprioceptive neuromuscular facilitation encompasses all aspects of the rehabilitation process—and can help patients with various dysfunctions achieve their goals (Scifers,2004, http://physical-therapy.advanceweb.com/Article/The-Truth-About-PNF-Techniques-1.aspx).

PNF patterns of movements were developed because all normal coordinated human movements occur in spiral or diagonal motions. Muscular contractions are strongest and most coordinated during these diagonal patterns of movement. These diagonal patterns involve rotation of the extremities and require core stability. Muscular contraction is also enhanced through irradiation and there is optimal facilitation of the stretch reflex in a synergistic muscle group during movements within these patterns of movement (Knott, Voss, 1968).

Proprioceptive neuromuscular facilitation (PNF) stretching techniques are commonly used in the athletic and clinical environments to enhance both active and passive range of motion with a view to optimising motor performance and rehabilitation. PNF stretching is positioned in the literature as the most effective stretching technique when the aim is to increase passive range of motion (Sharman, Cresswell, Riek, 2006).

Terms about muscle contraction are commonly used when discussing PNF. Concentric isotonic contraction is when the muscle shortens, eccentric isotonic is when it lengthens even though resisting a force is being applied, and isometric contraction is when the muscle remains the same length even while it is contracting (McAtee, Charland, 1999).

On the other hand, we can not talk about PNF technics without making reference to Golgi tendon organ and Muscle spindles.

Muscle spindles are sensory receptors within the belly of a muscle, which primarily detect changes in the length of this muscle. They convey length information to the central nervous system via sensory neurons. This information can be processed by the brain to determine the position of body parts. The responses of muscle spindles to changes in length also play an important role in regulating the contraction of muscles, by activating motoneurons via the stretch reflex to resist muscle stretch (Dumitru, 1988). Muscle spindles are found within the belly of muscles, embedded in extrafusal muscle fibers. Its are composed of 3-12 intrafusal muscle fibers, of which there are three types:

- dynamic nuclear bag fibers (bag1 fibers)
- static nuclear bag fibers (bag2 fibers)
- nuclear chain fibers and the axons of sensory neurons (Heckmann, Gorassini, Bennett, 2005)

The Golgi organ (also called Golgi tendon organ, tendon organ, neurotendinous organ or neurotendinous spindle), is a proprioceptive sensory receptor organ that is located at the insertion of skeletal muscle fibers into the tendons of skeletal muscle. It provides the sensory component of the Golgi tendon reflex. When the muscle generates force, the sensory terminals are compressed. This stretching deforms the terminals of the Ib afferent axon, opening stretch-sensitive communication channels. As a result, the Ib axon is depolarized and fires nerve impulses that are propagated to the spinal cord. The action potential frequency signals the force being developed by the 10 to 20 motor units within the muscle. This is representative of whole muscle force (Heckmann, Gorassini, Bennett, 2005; Prochazka; Gorassini, 1998).

Techniques

Most PNF stretching techniques employ isometric agonist contraction/relaxation where the stretched muscles are contracted isometrically and then relaxed. Some PNF techniques also employ isometric antagonist contraction where the antagonists of the stretched muscles are contracted. In all cases, it is important to note that the stretched muscle should be rested (and relaxed) for at least 20 seconds before performing another PNF technique. The most common PNF stretching techniques are:

Contract Relax: Passive placement of the restricted muscle into a position of stretch followed by an isometric contraction of the restricted muscle. Most isometric contractions in PNF stretching techniques should he held for a minimum of 3 seconds (Surburg, Schrader, 1997) at a sub maximal effort (20-50% of maximal effort) to avoid muscle fatigue and injury (Feland, Marin, 2004). After the contraction period the patient is instructed to relax the restricted muscle that was just contracting and activate the opposing muscle to move the limb into a greater position of stretch. Through Reciprocal Inhibition, the tight muscle is relaxed, and allowed to lengthen.

Hold Relax: Very similar to the Contract Relax technique. This is utilised when the agonist is too weak to activate properly. The patient's restricted muscle is put in a position of stretch followed by an isometric contraction of the restricted muscle. After the allotted time the restricted muscle is passively moved to a position of greater stretch. Contraction times and efforts will remain the same as the Contract Relax technique. This technique utilizes the golgi tendon organ, which relaxes a muscle after a sustained contraction has been applied to it for longer than 6 seconds (http://en.wikipedia.org/wiki/PNF_stretching).

Hold-Relax Agonist: Most familiar. It can be used to lengthen out tight muscle and increase passive range of motion. In this technique, the tight muscle is the antagonist, hence the agonist contracts (provided that the agonist is strong enough). The therapist asks the patient to isometrically contract the agonist for around 6 seconds before it gets moved further into range. Through Reciprocal Inhibition, the tight muscle is

relaxed, and allowed to lengthen. Verbal cues for the patient performing this exercise would include, "Hold. Hold. Don't let me move you."(http://en.wikipedia.org/wiki/PNF_stretching)

Hold-Relax Antagonist: Very similar to the Hold-Relax Agonist technique. This is utilised when the agonist is too weak to activate properly. The patient isometrically contracts the tight muscle (the antagonist muscle) against the therapist's resistance. After a 6 second hold has been achieved, the therapist removes his/her hand and the patient concentrically contracts the agonist muscle (the muscle opposite the tight muscle, the non-tight muscle) in order to gain increased range of motion. This technique utilizes the golgi tendon organ, which relaxes a muscle after a sustained contraction has been applied to it for longer than 6 seconds.

Notice that in the hold-relax-contract, there is no final passive stretch. It is replaced by the antagonist-contraction which, via reciprocal inhibition (see section Reciprocal Inhibition), serves to relax and further stretch the muscle that was subjected to the initial passive stretch. Because there is no final passive stretch, this PNF technique is considered one of the safest PNF techniques to perform (it is less likely to result in torn muscle tissue). Some people like to make the technique even more intense by adding the final passive stretch after the second isometric contraction. Although this can result in greater flexibility gains, it also increases the likelihood of injury (http://web.mit.edu/tkd/stretch/stretching_4.htm).

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Hold Relax Swing: This technique (and a similar technique called the hold-relax-bounce) actually involves the use of dynamic or ballistic stretches in conjunction with static and isometric stretches. It is very risky, and is successfully used only by the most advanced of athletes and dancers that have managed to achieve a high level of control over their muscle stretch reflex (see section The Stretch Reflex). It is similar to the hold-relax technique except that a dynamic or ballistic stretch is employed in place of the final passive stretch (http://web.mit.edu/tkd/stretch/stretching_4.html).

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Hold-Relax-Swing/Hold-Relax Bounce: These are similar techniques to the Hold-Relax and CRAC. They start with a passive stretching by the therapist followed by an isometric contraction. The difference is that at the end, instead of an antagonist muscle contraction or a passive stretching, dynamic stretching and ballistic stretching is used. It is very risky, and is successfully used only by people that have managed to achieve a high level of control over their muscle stretch reflex. Ballistic stretching should ONLY be used by athletes prior to engaging in a *High Energy* movement (e.g. A sprinter running a 100m dash) (Arredondo, 2009).

Rhythmic Initiation: Developed to help patients with Parkinsonism overcome their rigidity. Begins with the therapist moving the patient through the desired movement using passive range of motion, followed by active-assistive, active-resisted range of motion, and finally active range of motion.

Rhythmic Stabilisation: and Alternating Isometrics are very similar in that they both encourage stability of the trunk, hip, and shoulder girdle. With this technique, the patient holds a weight-bearing position while the therapist applies manual resistance. No motion should occur from the patient. The patient should simply resist the therapist's movements. For example, the patient can be in a sitting, kneeling, half-kneeling, or standing position when the therapist applies manual resistance to the shoulders. Usually, the therapist applies simultaneous resistance to the anterior left shoulder and posterior right shoulder for 2–3 seconds before switching the resistance to the posterior left shoulder and the anterior right shoulder. The therapist's movements should be smooth, fluid, and continuous. In AI, resistance is applied on the same side of the joint. In RS, resistance is applied on opposite sides of the joint. Note this is not a stretching technique, but instead a technique used to strengthen joint musculature and improve proprioception (http://en.wikipedia.org/wiki/PNF_stretching).

Slow reversals: This technique is based on Sherrington's principle of successive induction, i.e. that immediately after the flexor reflex is elicied the exitability of the extensor reflex is increased.This technique is used to strengthen and buildup endurance of weaker muscles and develop co-ordination and establish the normal reversal of antagonistic muscles in the performance of movememt (http://en.wikipedia.org/wiki/PNF_stretching).

Alternating isometrics: This technique encourages stability of postural trunk muscles and stabilizers of the hip and shoulder girdle. With alternating isometrics, the patient "holds" his position, while manual resistance is alternately applied in a single plane from one side of the body to the other. No motion should occur. Instead, the patient should maintain the starting position of the involved limb. This technique can strengthen the trunk, a single extremity or bilateral extremities, and can be applied with the limbs in the open- or closed-kinetic chain (Scifers, 2004).

Alternating rhythmic stabilization: This technique is simply an extension of alternating isometrics in which the involved muscle groups co-contract. Rhythmic stabilization is most commonly performed in a closed-chain position to further enhance muscular co-contraction and joint stability. With this technique, the clinician applies manual isometric resistance in a multidirectional pattern. The clinician may apply simultaneous manual resistance in multiple directions, forcing the multiple muscle groups to contract simultaneously to support and stabilize the extremity. This technique is particularly beneficial in isometrically contracting the proximal joint rotators (Kisner, Colby, 2002).

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PNF stretching is probably "the most effective form of flexibility training available to you for increasing your range of motion (ROM)". This is a more advanced form of flexibility training, involving both the stretch and contraction of the targeted muscle group

(http://www.google.ro/imgres?imgurl=http://www.projectswole.com/wpcontent/uploads/2009/10/pnf-stretching-1.jpg&imgrefurl=http://www.projectswole.com/flexibility/).

There are two types of PNF stretching:

passive - stretching without a muscular contraction
active - using a voluntary muscular contraction
PNF techniques can be both passive (no associated muscular contraction) or active (voluntary muscle contraction). While there are several variations of PNF stretching, they all have one thing in common - they facilitate **muscular inhibition**. It is believed that this is why PNF is superior to other forms of flexibility training.

How PNF Stretching Works

For the following information, you should know that the golgi tendon organ relaxes a muscle after a sustained contraction has been applied to it for longer than 6 seconds.
Isometric contractions (the hold phase) and concentric contractions (the contract phase) used immediately before the passive stretch (the relax phase) facilitate autogenic inhibition. Autogenic inhibition is a reflex relaxation that occurs in the same muscle where the golgi tendon organ is stimulated.
Similarly, we can use a technique that involves a concentric contraction of the muscle group opposing that which is being stretched, in order to achieve reciprocal inhibition. Reciprocal inhibition is a reflex muscular relaxation that occurs in the muscle that is opposite the muscle where the golgi tendon organ is stimulated.

Using the hold, contract, and relax phases, we can develop the following 4 PNF stretching techniques. While slightly different, each technique starts by holding a passive stretch for about 10 seconds (http://www.google.ro/imgres?imgurl=http://www.projectswole.com/wpcontent/uploads/2009/10/pnf-stretching1.jpg&imgrefurl=http://www.projectswole.com/flexibility/improve recovery time after a strenuous workout).

Benefits of PNF stretching:

- targeting a specific muscle group
- increasing flexibility and ROM
- increasing muscular strength
- physical therapy
- rehabilitation(http://www.google.ro/imgres?imgurl=http://www.projectswole.com/wpcontent/uploads/2009/10/pnf-stretching-1.jpg&imgrefurl=http://www.projectswole.com/flexibility/improve recovery time after a strenuous workout).

General Guidelines for PNF Stretching

Always precede PNF stretching with 10-15 minutes of moderate exercise.
Avoid PNF prior to exercise. Choose dynamic stretching and mobility work instead.
Perform only one stretch per muscle group per PNF session.
Perform at least two sets of each stretch for the chose muscle group.
Hold each stretch for 30 seconds after the initial contraction.
Separate PNF stretching routines with at least a 48 hour recovery period (http://www.google.ro/imgres?imgurl=http://www.projectswole.com/wpcontent/uploads/2009/10/pnf-stretching1.jpg&imgrefurl=http://www.projectswole.com /flexibility/improve recovery time after a strenuous workout).
PNF stretching usually involves a 10 second push phase followed by a 10 second relaxation phase, typically repeated a few times. PNF stretching is capable of producing greater improvement in flexibility compared to other techniques. Its disadvantage is that it typically requires a partner, although stretching with a partner may have some motivational advantage for some individuals (http://www.exrx.net/ExInfo/Stretching.html).

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RESPIRATORY GYMNASTICS, MEANS OF IMPROVING THE HEALTH CONDITION TO HIPERTENSIVE PERSONS

JIANU ANCA[1], MACOVEI SABINA[1]

Abstract
Aim. Through the resulting complications such as myocardial infarction, stroke or heart failure, essential hypertension is placed first among causes of cardiovascular mortality. Thus, it becomes necessary to apply all the means by which to combat the cardiovascular risk factors and cardiac activity is facilitated.
Purpose. For proper functioning of the cardiovascular system need a healthy respiratory system to provide vital oxygen to all cells and tissues of the body. In these circumstances, the identification of a therapy based on movement, but accesul and effective with minimal side effects and the possibility of applying to as many hypertensive patients, regardless of age, underlying disease, lifestyle adopted is a necessity.
Methods. It is assumed that respiratory gymnastics can improve the health and quality of life of people with essential hypertension. The study was conducted on a number of patients of the Medical Center Class, aged 45-56 years, diagnosed with essential hypertension and beneficiaries of a program-model of respiratory gymnastics for 3 weeks. Basic methods used were study case and the experiment.
Results. After monitoring patients, we found that a respiratory gimnastics program increased patient quality of life.
Conclusions. Development and implementation of a respiratory gymnastics program aimed to increase exercise capacity is a compulsory requirement for improving the health condition to hypertensive.
Key words: hypertension, respiratory gymnastics, quality of life.

Introduction

Essential hypertension is an important public health matter.

According to the World Health Organization reports (Romanian Journal of Cardiology, 2007), this is ranked first in terms of cardiovascular mortality.

In 95% of the cases, the aetiology of the disease is unknown (essential) although it is stated that alcohol intake and obesity may play an important role (Hope, Longmore, Hodgets et al., 1995).

The process of demographic ageing which is ongoing both globally and nationally contributes to a high percentage of patients with essential hypertension.

Due to the incidence of hypertension and cardiovascular and cerebrovascular diseases caused by it, the costs for patients' diagnosis and treatment administration are constantly increasing.

Under these circumstances, it is necessary to apply all means to fight against cardiovascular risk factors. The personal attitude to eliminate all cardiovascular risk factors has the potential to prevent atherosclerosis and to delay the onset of its manifestations and consequences, in the event of its installation.

The risk of cardiovascular disease increases exponentially with the number of risk factors present on an individual.

Karassi (1988) claims that "*when risk factors are associated, their effects do not add up, but they multiply*".

Controlling risk factors is one way to improve the cardiovascular activity.

The heart is able to provide for each organ of the human body continually, throughout lifetime, the food and energy necessary for a normal functioning due to the heart muscle properties (excitability, automatism, conductivity and contractibility).

To fulfil its function, the heart needs a proper environment, a healthy lung that will permanently provide essential oxygen for the body. If blood is not freed from harmful impurities that saturate it, from carbonic acid gas through the regenerator process from the lungs, it will return in the body through the arteries, and its obvious result will be illness.

According to Hough, (2001) the neighbourhood relations between heart and lung are reflected in their integrated response at disturbances in each other, especially when intravascular pressure is involved.

Arădăvoaice (2010) mentions stress as a major factor in generating 75% of cardiovascular diseases.

Selye (quoted in Luban-Plozza, Pozzi and Carlevaro, 2000) defines stress as the body's general adaptation syndrome against any type of aggression. For the body to adjust to this, it releases hormones as well as cortisol, adrenaline, increasing the amount of glucose and energy substances in the blood and enhances the activity of the heart, increasing blood

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pressure.

A certain amount of stress is good for a person, it is useful due to dynamism and extra energy they emit, but the body's resistance potential overuse can cause cardiovascular disease.

Stress phenomenon, continuously increasing in the modern life of the contemporary man, leads to increased blood pressure and heart rate, as well as a fast and shallow breathing.

Often, daily life causes modern man to adopt a rhythm too accelerated, often experience anxiety, irritation, and other negative moods, influencing thus the speed and quality of breathing.

On the other hand, modern man lifestyle becomes increasingly sedentary, reason for which Nussio (2009) believes that it makes us use only one tenth of our breathing capacity.

Whether at home, or at work, people take extended static positions, often wrong, unconsciously modifying their natural way of breathing and developing the habit of shallow breathing, not deeply, limiting oxygen inputs to a vital minimum.

In this context, we believe that including breathing gymnastics in the treatment regimen of individuals with essential hypertension can offer a new insight into the evolution of this disease with the possibility of fast recovery, with the lowest biological and material cost.

Breathing gymnastics programs are needed for both healthy individuals who have lost this practice, and hypertensive individuals, blood oxygenation being essential for the entire body. Oxygen intervenes in all chemical processes in the body and it is a vital element which, on one hand, can synthesize beneficial elements, and on the other hand, eliminates toxic substances from the body.

Hypertensive individuals must learn correct breathing which relaxes the chest muscle and which makes the diaphragm and lungs function at full capacity.

A physical training without proper breathing will lead to rapid fatigue and lower results in terms of benefits gained after practising the physical training program, benefits represented by the relaxation of the entire body, stress relieve, improvement of internal organs efficiency and the entire body respectively optimization of quality of life.

Moreover, "*breathing is the fundamental motivation of the body*" (Maddock, 1998) if this function were absent, we would suffocate and there would be no life.

Methods

The aim of this article is to improve the health of individuals with essential hypertension through breathing gymnastics programs and to see, first, to what extent the subjects accept, understand and respect the latter, and secondly, to determine their influence on the hypertensive individuals' quality of life.

Research methods used to demonstrate the positive influence of breathing gymnastics on the above mentioned individuals were: theoretical documentation method, observation method, survey method, experimental method, specific measurement and evaluation methods, graphical method, case study method.

The study was conducted on a number of 5 subjects, aged 45 to 56 years, diagnosed with essential hypertension.

They were evaluated in September 2012 through anthropometric and functional measurements, the breathing gymnastics program being applied on subjects for 3 weeks, between September 2012 and October 2012.

Devices for data measuring, recording and processing such as: pulse oximeter, blood pressure monitor, meter band, questionnaire to inquire on the level of quality of life (well-being) were purchased to evaluate and monitor subjects.

We mention that this study is ongoing, which is why there was not an intermediary evaluation of the subjects, but the role of breathing gymnastics on them was identified using certain parameters monitored on every training session.

Also we point out that this article is part of the first author's PhD thesis.

The comparative study was conducted at the Medical Class Centre of Bucharest, where the minimal existing material equipment of the centre's physiotherapy room was used and the subjects were given special attention during the training itself to avoid any unpleasant incidents and accidents due to physical effort.

We emphasize that no subject was pushed to the limits in terms of effort tolerance, knowing that, at the beginning, exercise may cause slight dizziness due to increased arterial blood oxygen saturation.

The subjects who benefited from the breathing therapy were chosen based on the following inclusion criteria:

- Resting heart rate over 60 beats/minute,
- Age up to 65 years,
- Systolic blood pressure between 100 -170 mmHg,
- Absence of lung disease,
- Absence of angina pectoris or other significant symptoms during effort test and actual effort: dizziness, shortness of breath, dyspnoea, headaches
- Subjects' consent to cooperate within the study,
- Subjects' full involvement in this study.

Subjects who met the inclusion criteria were evaluated in terms of somatometric and functional

parameters and were included in a breathing gymnastics program.

According to Albu, Rascarachi, Albu, Rascarachi, (2001), "*a breathing gymnastics session is a methodical lever with large medical and psycho-pedagogical valences*" whereby the specialist, applying the developed program, influences the hypertensive' breathing function inferring on blood circulation, cardiac effort and, ultimately, quality of life.

The objectives of the program, taken and adapted from Avramescu, (2007), Armean, (2004) and Cinteză, Marcu, (2011) are represented by the following:

- ✓ Balancing the nervous system and neuro-psychological relaxation;
- ✓ Decreasing cardiac effort for a given effort level;
- ✓ Increasing lung elasticity to improve lung volumes and increasing vital capacity;
- ✓ Promoting vasodilation in skeletal muscles and decreasing peripheral resistance;
- ✓ Improving coordination as a means of relaxing muscles;
- ✓ Reaching and maintaining optimal body weight;
- ✓ Preventing atherosclerosis phenomena;
- ✓ Educating the subject and the family to adopt a reasonable lifestyle.

The breathing gymnastics model program applied on hypertensives consisted of exercises that trained breathing muscles on all three levels of the lungs. These were determined according to health, age, gender, level of training, effort or ability of each of the subjects.

The breathing gymnastics program included moderate intensity aerobic exercises during which the heart contracts faster and harder to meet the oxygen demands at the level of the muscles involved in the effort and the breathing capacity increases. The program carried out for 30 minutes, 3 times a week, included extensive movements of arms and legs in order to increase the force of contraction of the heart muscle, but also exercises that were based on coordination, balance, twisting torso to rebalance the nervous system.

By working the muscle mass, the body's maximal oxygen consumption increases the benefits reflecting on cardiovascular activity and implicitly on the hypertensive evolution. This aspect is also supported by Aronow, Fleg, Rich, (2008).

All exercises were combined with the breathing activity, except for those used at the beginning of the session that were meant to activate the structures involved in ventilatory dynamics.

The breathing gymnastics stages are similar to those of any physical training: a warming up period, known as one of "*warm-up*" (Cinteză, 2005), an actual effort period and a relaxation period, "*cooling*" or „*cool-down* "(Tache, 2001).

In terms of physical training methodology used to improve the cardiovascular functional capacity as well as the resistance of subjects with essential hypertension, the parameters of the effort carried out by the latter can be highlighted as follows:

- ✓ Type of exercise → aerobic exercise
- ✓ Frequency → 3 times a week
- ✓ Exercise intensity→ moderate 60-75% of theoretical maximum heart rate
- ✓ Time→ 30 minutes

The 5 subjects, who benefited from the above mentioned program, are not a homogeneous group, even if they have the same diagnosis and are adults with ages ranging between 45 to 56 years.

Some of them are ongoing an anti-hypertensive treatment, others must follow a diet, but each of them needs a reasonable lifestyle where complying with rules such as fighting against extended stress and cardiovascular risk factors (smoking, obesity, hypercholesterolemia, hypertension, physical inactivity, unhealthy diet) is imperative in order to reduce the risk of cardiovascular disease.

Following the subjects' evaluation, we obtained data that we introduced in tables and charts representing basic information on them used to assess their progress in terms of kinetic.

Results

The following somatometric parameters were monitored and studied: height, weight, chest perimeter (during inhale and exhale), chest elasticity, hips and abdomen perimeter.

By analysing the values of these parameters we can observe:

- All subjects have a low and very low chest elasticity, with values ranging between 1-4;
- Abdominal perimeter has values over 110 and indicates cardiovascular risk all subjects of the present study are exposed to;
- Body Mass Index (BMI) values are very high, ranging from 31, 64 to 38,6, indicating the presence of first degree of obesity (BMI: (BMI: 30 to 34,99) and degree II of obesity (BMI: 35 to 39,99).

The table below presents personal data and subjects' somatometric assessment on initial evaluation.

Summarizing the values of the functional parameters measured at rest, we can state that, unlike the values of heart rate and systolic and diastolic blood pressure, breathing rate and those of arterial O2 saturation are not appropriate.

The respiration rate with values ranging between 18-33 breaths/minute is a high one, considering that the normal limits are between 16-18 breaths/minute.

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Subject 2 has the highest values while subject no.3 has the lowest breathing rate among the values registered. The latter presents a better thoracic elasticity than the others.

The saturation in O_2 of the arterial blood (SpO_2) has values between 94-96 % on all subjects.

Cardiac rate is lower at Subjects no.1 and 5 comparing to the others, but within normal limits, due to both beta blocker and anti-depressing medication that they are taking.

Table 1. Subjects of the study: personal data and anthropometric evaluation

	Subject 1	**Subject 2**	**Subject 3**	**Subject 4**	**Subject 5**
First and last name	S.E.	M.I.	C.J.	D.C.	C.A.
Gender	Female	Male	Male	Male	Female
Age (years)	56	57	46	54	42
Diagnosis	Hypertension, ischemic heart disease	Hypertension, ischemic heart disease, hypercholesterolemia	Hypertension,	Hypertension, ischemic heart disease	Postpartum hypertension
Heart medication	Beta blockers, antihypertensive	Refuse medical treatment	Without medication	Without medication	Beta blockers
Height (cm)	154	176	185	182	165
Weight (kilos)	75	108	111	104	105
Chest perimeter (during inhale)-cm	111.5	119	120	116	111
Chest perimeter (during exhale)-cm	110.5	117.5	124	119	108.5
Chest elasticity (cm)	1	1.5	4	3	2.5
Hips perimeter (cm)	110	118	111	109	124
Abdominal perimeter (cm)	111	121	112	110	110
Body mass index	31.64	34.95	32.45	31.41	38.6

We can encounter slightly increased values at Subject no.3 and 4. Increased cardiac rate is a risk factor for cardio-vascular mortality and morbidity both for healthy subjects and for those that have essential arterial hypertension or other cardiac pathology, and this statement is sustained by a lot of studies.

Levy , White, Stroud, Hillman, quoted by Bădilă, Daraban, Bartoş et. al. (2012) assert that "t*he first study to report an association between increased heart rate and cardiovascular disease dates about 60 years ago and proved that subjects with resting tachycardia were more likely to develop hypertension.. More than 40 epidemiological studies have brought evidence ever since that heart rate is independently associated with cardiovascular and all-cause mortality."*

Within subjects' evaluation, we used the scale to evaluate the quality of their lives. The subjects were requested to give a grade from 1 to 10 for their life quality, under the following conditions:

- 1-2 : means much worse
- 3-4 : worse
- 5-6 : the same
- 7-8 : better
- 9-10 much better

The starting point of the scale is the one proposed by Armean, (2004) where the subject is interviewed and asked to give a grade from 1-5 to its well-being, where 1 is very good and 5 is much worse.

The reason Armean 's (2004) scale is modified with values from 1 to 10 resides in the fact that most people consider superior grades (8, 9, 10) to be the best.

Table 2 reflects the place life quality occupies for each of the 5 subjects.

Table 2. Quality of life scale

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Evaluation of quality of life	7	6	8	8	7

Also, we further present the table with the current study subjects and initial measurements of functional parameters

Table 3. Functional evaluation of subjects

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
First and last name	S.E.	M.I.	C.J.	D.C.	C.A.
Gender	Female	Male	Male	Male	Female
Breathing rate	25 breaths/min	33 breaths/min	18 breaths/min	20 beats/min	20 breaths/min
Resting heart rate	75 beats/min	75 beats/min	84 beats/min	88 beats/min	76 beats/min
Training heart rate	135 minus 20 beats/min	136 beats/min	147 beats/min	142 beats/min	147 minus 20 beats/min
Systolic blood pressure/diastolic blood pressure	105/76 mmHg	170/90 mmHg	135/85 mmHg	130/80 mmHg	135/90 mmHg
SpO2	94%	96%	95%	96%	94%

Discussions

During the 3 weeks of training, subjects were able to learn physical exercises specific to the program and the evolution of the intensity of the breathing gymnastics session was made gradually and individually for each subject. If at the beginning of the programme the exercises carried out were fewer than established in the model-programme, at the end of the programme the recurrence of the exercises reached and even exceeded the target level which is why the second breathing gymnastics programme started to be put into practice.

Each patient was assisted individually in order to avoid possible complications and cardiorespiratory parameters were periodically measured (blood pressure, heart and breathing rate, SpO2).

During the program there were some incidents that required interrupting the session for 5-10 minutes, while the subject was resting, breathing deeply, and hydrating.

Thus, in the case of subject no.1 during the first six meetings, the resting values of blood pressure and heart rate decreased significantly during effort (e.g. from a heart rate of 80 beats/minute a 53 beats/minute one was reached). At first they decreased after 10 minutes effort, then after 15 minutes, and in time they decreased much less and after 20-25 minutes constant effort. After the effort ends, the parameters return to the resting values.

We mention that Subject no.1 is undergoing a treatment with beta blocker administered in the morning.

Following these regular manifestations we sent her to a specialist cardiology consult, suspecting a heart failure. The result was negative:

Subject no.1 continued with the breathing gymnastics program and even if at first she evaluated at 7 the quality of her life and she breathed with difficulty during the ADL s and I-ADLs (daily routine activities), at the end of the 3 weeks, through an anamnestic interview, she ranks the quality of her life ar 8 ,*"even 9"* if we are to quote her, and she considers that she can carry out more easily certain daily activities.

Subject no.2 couldn't carry out the entire breathing gymnastics program due to increased values of the blood pressure. Two of the sessions were not carried out because of the systolic blood pressure reached 180 mmHg and 188 mmHg. In those cases diaphragmatic breathing and lower chest exercises were performed.

Despite repeated explanations received on complications he might be exposed to in the absence of an anti-hypertensive treatment, Subject no.2 refuses oral treatment, but he continues with the kinetic one,

considering that he breathes better and feels better after it.

Last tension value measured before the breathing gymnastics program -150 mmHg reflects the well-being he mentioned.

Subject no.3 accused a lack of air during the first sessions and he was disturbed by yawning. The body's lack of resistance to stress was observed through the arterial O2 saturation value of 88% after 20 minutes effort. He didn't accuse the above-mentioned manifestations in the last 2 sessions.

Subject no.4 carried out the exercises within the breathing gymnastics model program for a longer period of time, choosing a slow rhythm of execution.

Fatigue is the symptom that he frequently accused. The anamnestic interview shows that his physical condition is unchanged, but notes a well-being both physical and mental after stopping physical training.

Subject no. 5 manifested dizziness and nausea throughout the program which are extremely unpleasant symptoms that require the interruption of the physical training. The manifestations ceased, as the body adapted to stress and Subject no. 5 feels much quieter, calmer and she no longer gets tired so easily.

Due to these less significant positive aspects observed on the 5 subjects after 3 weeks of specific physical training, we can say that breathing gymnastics influences in a positive way the life quality of individuals with essential hypertension.

Influence of breathing exercises in the short term on health of hypertensive patients was observed by Chacko et al. (2005). They were monitored hypertensive patients during breathing exercise performed in a normal rhythm spontaneously, slow and fast and concluded that six breaths per minute performed slowly reduce sympathetic nervous system activity and improve baroreflex sensitivity, with positive effects on the psyche and blood pressure.

The present results can be validated by studies such as that of Schein et al. (2001) which demonstrated that a respiratory pattern (slow and regular) obtained with a device that is able to listen to relaxing music and connect patients 10 minutes daily for 8 weeks, decreased blood pressure values in the long term. The efficiency of such devices that cause a slow and regular breathing is confirmed by Elliot et al. (2004). The study shows a greater decrease tension and thus increase exercise capacity in hypertensive patients who have spent more than 180 minutes for 8 weeks using the device by which slowed breathing, compared with those who spent less 180 minutes two months.

Conclusions

This study demonstrated that breathing gymnastics is a significant and valuable therapeutic means. The study was conducted on a small number of 5 subjects, a non-homogeneous group but who evaluated the quality of their lives as being slightly better than the initial one, after three weeks of breathing gymnastics. The breathing gymnastics program practised regularly influenced and increased the tolerance to effort of the current study subjects. Breathing gymnastics, through proper breathing exercises of muscle and neuro-psychological relaxation, improved the activity of the nervous system resulting in a better mental state. The interpretation of data from the subjects' evaluation shows that hypertensive people achieve a better quality of life by following the proposed training program. It is mandatory to elaborate and apply a breathing gymnastics program in order to improve the quality of life of individuals with essential hypertension.

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THE EFFECTS OF UNIFIED SCOUTS ON LIFE SKILLS FOR CHILDREN WITH MENTAL RETARDATION IN BAHRAIN KINGDOM

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Abstract
Purpose. Unified scouts brought together athletes with and without mental retardation to train and compete on the same scout team. Throughout the year, Unified scouts improve their physical fitness, sharpen their skills, challenge the competition and have fun, too. Hence, this study aimed to identify the impact of the effects of unified scouts on life skills for children with mental retardation in Bahrain Kingdom.
Methods. The sample contains (25) children (20 children with mental retardation and 5 normal children) divided into three groups were two experimental groups and one control group, (age: 12± 0.3 years), the first experimental group contains (5 children adding 5 children with mental retardation)(unified group) , the second group contains (8) children with mental retardation)(non-unified group), all the two groups participated in the intervention scout camp program for (4) weeks , and the third group contains (7) children with mental retardation as a control group, participated in the traditional program.
Results. Scout camp program and inclusion have a positive impact on the development of life skills compared with the control group. There is an improvement in the scout knowledge among children with mental retardation in Bahrain Kingdom**.**
Conclusions. Boy Scout and Girl Scout groups can be good sources of partners..
Key words: Scouts, life skills, disability, inclusion.

Introduction

The Human is social object lives and spends most of his time in the group or groups, affects and is affected by the individual in the growth hardly significant changes include aspects of personal, all he grows physically and physiologically and physically and grow mentally, emotionally and socially, and the Girl Guides movement is a movement that allows girls to interact with colleagues dispersed through educational activities Recreational and mobility, social and cultural which is achieved with the aim of the exercise of this activity is contributing to the development of the girl who is physically and psychologically, socially, culturally and spiritually so that they become a good citizen in the community, locally, nationally and globally. (Butler, 2000)

The movement indicative revolution is educational but not as well as it is foremost an idea wants to be renewed, the outdoor life and was soon the idea that unfolded for the active ingredient in the field

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of education, we can consider the Girl Guides movement is a movement complementary to prepare for school and valid to fill some of the gaps that cannot avoid its presence in the regular curriculum and in one word it is a school girl to active public life by relying on its interesting means natural. (Laura-Elena, 2004)

The Girl Guides movement means educational purposeful longer affiliates prepared properly for life and training proper training to bear the consequences of the future are based on the foundations of the educational process and the properties of the stages of growth and in line with the desires and inclinations and mental capacity and physical to the occupants of this movement under the leadership of the Union of the year have been allocated a General Union of Scouts.

The Girl Guides movement organization welcomes all girls want to join them, they are a great family members, many in all the country under the auspices of the World Association of Girl Guides.

It is also a global movement is voluntary educational, not political is open to all without distinction of sex, religion or colour and in accordance with the purpose, principles and method devised by the founder of the movement Lord " Baden Baul" and his wife.

A youth with a disability is more like other youth than he or she is different. Young people with mental challenges are not exceptions to this rule. Scouting leaders should take care not to unnecessarily segregate them and make them feel different, for being like other young people is important to the child's self-esteem. It is a basic principle of Scouting that the experience of a youth with a disability should be as typical of the regular Scouting experience as possible. (Boy Scouts of America. 2007)

The Boy Scouts of America in 1910 has included fully participating members with physical, mental, and emotional disabilities. The Boy Scout Handbook Has developed Braille editions. Merit badge pamphlets have been recorded on cassette tapes for Scouts who are blind. Closed-caption training videos have been produced for Scouts who are deaf. In 1965, registration of over-age Scouts with intellectual or developmental dis-abilities became possible—a privilege now extended to many Scouts with disabilities.

The basic premise of Scouting for youth with disabilities is full participation. Youth with disabilities can be treated and respected like every other member of their unit. They want to participate like other youth—and Scouting provides that opportunity. Many of the programs for Scouts with disabilities are directed at (Siperstein, 2002) helping unit leaders develop an awareness of people with disabilities among youth without disabilities and (Martin and Mike 2004) encouraging the inclusion of Scouts with disabilities and special needs in Cub Scout packs, Boy Scout troops, Varsity Scout teams, Venturing crews, and Sea Scout ships. There are many units composed of members with similar disabilities—such as a Boy Scout troop for Scouts who are blind or a Cub Scout pack for Scouts who are deaf. These Scouts should be encouraged to participate in scouting activities at the district, council, area, regional, and national levels along with other units. Many of these disability-specific Scouting units are located in schools or centres for youth with disabilities that make the Scouting program part of their curriculum. (Boy Scouts of America. 2007).

Many local types of council have established their own advisory committees for youth with disabilities and special needs. These committees develop and coordinate an effective Scouting program for youth with disabilities and special needs, using all available community resources.

Local councils are encouraged to remove any physical barriers so youth with disabilities and special needs can participate in weekend and summer resident camp experiences. Most camp operations are willing to work with the troop leadership to design a program for Scouts with disabilities if given adequate advance notice and assistance. Some local councils have professional staff members responsible for the program for Scouts with disabilities. While there are Scouting units/groups composed exclusively of youth with disabilities, experience has shown that Scouting works best when all Scouts with disabilities are part of an inclusive unit/group.

The best guide in working with youth who have dis-abilities is to use respect and good common sense. It's obvious that a Scout who uses a wheelchair may have problems fulfilling a difficult hiking requirement, but the need for accommodation might not be so obvious when it comes to the Scout with a learning disability.

Scouting can challenge the youth who cannot run, jump, swim, or hike like other children. These children want to have the fun that other young people enjoy. Each child is entitled to that experience. (Boy Scouts of America. 2007)

For a child with a disability, this spark of deep, often fierce, desire to be part of the group can be fanned into a burning ambition. The resulting performance can be astounding. Scouts who have overcome dis-abilities have achieved remarkable things.

Satisfaction for the volunteer leader can be even greater. Volunteers know that Scouting is for all youth, but they must ensure that it remains so. How is a child with mental challenges brought into the program? What methods and teaching techniques help them to learn? How can they be given a place in a Cub Scout pack, a Boy Scout troop, a Varsity Scout team, a Venturing crew, or a Learning for Life group? The leader holds the answers.

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Children with mental disabilities will especially benefit from the work of those who accept the challenges and rewards of working with these special youth. For these children, there can be no greater joy than that of being part of the Boy Scouts of America.

As public attitudes change, children with mental challenges are accepted and cherished for their innocence and uniqueness. There is no shame; children with developmental disabilities don't hide in disgrace. (Boy Scouts of America. 2007)

Parents, teachers, specialists, Scouting leaders, and many other citizens know that a child with mental challenges can be educated. Through medical and scientific advances, we are beginning to understand the complexity of the brain, and the endless wonder of the human mind.

Experts in the field of mental challenges believe that the notion of "perpetual childhood" slows the progress of the individual. Keeping a child frozen in such a state, the experts say, is a grave error. (Kephart, 1987)

The girl Guides movement aims to contribute to the development of the girl who is physically, socially and psychologically, culturally and spiritually so that they become a good citizen in the community, locally, nationally and globally.

The researcher believes that students practice in the Girl Guides movement excels on schoolgirls others practices of the Girl Guides movement in the level of compatibility and emotional health, social and physical, psychological and clear through the camps and work skills and a sense of professional skills and self-reliance.

And the achievement of the purpose behind the exercise of various activities for the Girl Guides movement is done through the program.

Disabling conditions create difficult psychosocial problems for the youth and his family. In some instances, a family has overprotected, overindulged, and overemphasized the disability by preventing the youth from having social experiences that would develop him and give him a sense of belonging, and in doing some of the things that all youth enjoy. On the other hand, some disabled youth actually are rejected by the family and have had few socializing experiences. "Regardless of which of these extremes of reaction have impaired the youth, Scouting presents him with an opportunity to participate to the extent of his ability in the educational, recreational, and character- and citizenship-building programs that are inherent objectives of Scouting (Boy Scouts of America. 2007)

Hence, this study aimed to identify the impact of the effects of unified scouts on life skills for children with mental retardation in Bahrain Kingdom.

Methods

The sample contains (25) children (20 children with mental retardation and 5 normal children) divided into three groups were two experimental groups and one control group, (age: 12± 0.3 years), the first experimental group contains (5 children adding 5 children with mental retardation)(unified group) , the second group contains (8) children with mental retardation)(non-unified group), all the two groups participated in the intervention scout camp program for (4) weeks , and the third group contains (7) children with mental retardation as a control group, participated in the traditional program.

Procedures

The researcher used the following tools and devices:

- The balance of medical standards for measuring weight (kg).
- Tap to measure the height of the body.
- Form for recording the data.

To determine the tests used, the researcher conducted a survey of reference for studies and previous research and scientific references to identify the tests and standards for kindergarten phase which measure a developmental adaptive behaviour variable where the researcher tests identified as follows: -

1.Test the Goddard panel to measure the level of intelligence of a child.
2.Developmental adaptive behaviour scale preparation Farouk Sadiq
3.Tests to measure motor skills (20m running - threw a light ball- Standing long jump)
4.Scout skills

Test the Goddard panel

Method of Application

Divided into pieces ten into three groups and placed the right or left Screened by hand used by Screened then asked Screened that the trying trial and then three attempts fundamental asked Screened in every attempt to develop a cutting in their special places on the plate and rapid manner is then calculated time every attempt at using the unit (stopwatch) and the time will be recorded for each attempt and chronological age and mental age in a special form

Method of interpretation of grades:

Can be calculated (IQ) in several ways, including:

1.Calculate the average of the three attempts
2.Calculate the shortest time to try
3.The traditional way:
4.Take a short time to try
5.Custom table looking at this time
6.Take a mental age corresponding to this time and then turn the mental age of 12 months dividing
7.Divide the mental age to chronological age of 100
8.Limits of the scale:
9.Per attempt does not exceed its time five minutes

10. If Screened exceeded the age of 16 years chronological age is calculated by (192) a month

Adaptive Behaviour Scale

One of the most important tests that are used to measure adaptive behaviour for children with mentally retarded. The scale prepared by **Farouk Sadiq (1985)** and aims to measure the level of the various activities of the child in the Physical, natural, behavioural and social variables.

The scale consists of two main parts:

Part I: Includes ten areas and represents a developmental behaviour.

Part II: Includes fourteen rooms and represents behavioural disorders

Questions distributed the first part of the scale on ten key areas are:

1 - Actions independence.
2 - Body growth.
3 - Economic activity.
4 - Language development.
5 - The concept of number and time.
6 - Household chores.
7 - Vocational activity.
8 - Self Directed.
9 - Responsibility.
10 - Social normalization.

The measure implements psychologists, social workers, or special education teachers, or parents

The Bahraini study's results have shown coefficient of the stability of the first part of the measure by re-testing ranging from 0.65 to 0.87.

The Scout program

The researcher familiarized themselves with the scientific literature and previous studies and research related to the subject then put the content and potential activities and this has been putting proposed scout program facility.

The objective of the proposed program

The program aims to develop adaptive behaviour in children with retardation mental through a proposed scout program.

The foundations of the development program

1) That this program commensurate with the characteristics of children's age group (normal - with low mental retardation) from the age (11-14 years)
2) Take into account the contents of the program and the wishes of children Preference Sunni at this stage
3) Should be an interesting program for children.
4) That allows games for the child to move easily and conveniently taking into account the important element is the security and safety while carrying out the lesson.
5) Taking into account the gradient in the exercises from the simple to the complex and it is easy to difficult.
6) The use of tools such as small balls, scout games, and other in order to be doing the exercise in a grainy image of a child.
7) Placing activities, skills and natural movements of the child so characterized actively and continues to work.
8) Move the child's imagination and creative traditional activities.
9) Taking into account the principles and methods of teaching in the program.
10) Taking into account the level of maturity of the children in this stage
11) Taking into account linked to previous experiences with the needs of the child during the exercise activity

The division of the program

Scout camp program for (4) weeks , and the duration of the lesson (full day).

Tools used

Swedish seat

- Plastic ball size Medium, and Small.
- Decree by the board (circles, rectangles, squares and triangles) colour.
- Baskets.
- Colourful balloons.
- Low-rise blocks.
- Circles, triangles, squares and rectangles painted on the ground.

Methods of Teaching Program

Adopted, a researcher at the teaching content of the program on the following concepts:

1 - innovation and encourage innovative child.

2 - Kinetic exploration.

3 - kinetics activities and competitions raise children motivated to exercise activity.

4 - the problem and try to solve mobility in unfamiliar ways.

Pilot (Exploratory) study

After the completion of the proposed design of the program and before the implementation of the experiment, the researcher conducted a prospective study on a sample of 11 children from the same research community and is involved in the implementation of the program and the researcher benefited from the survey:

1 - make sure the program is suitable for child's capabilities.
2 - Make sure of the validity of the instruments and devices used.
3 - Make sure of the validity and reliability of the tests used.
4 - Know the time that it takes for children in the performance of each activity.
5 - Make sure you understand assistants and trained to use the tools and the measurement method.

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Statistical Analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups are reported as mean difference ± 95% confidence intervals (mean SD ± 95% CI). ANOVA one way were used to determine the differences in variables between the three groups. A P-value <0.05 was considered statistically significant.

Results

Table 1. Mean ± SD, change rate and "F" sign. Among the three groups in adaptive behaviour scale factors

Variables	Unified scout		Non-unified scout		Control		sign
	Pre	Post	Pre	Post	Pre	Post	
Actions independence	11.31±1.25	14.56±1.78	11.42±1.22	13.28±1.91	11.06±2.01	11.68±1.92	Sign
Body growth	10.28±1.32	12.97±1.69	9.97±1.47	11.41±1.88	10.20±1.91	10.57±2.05	Sign
Economic activity	1.27±0.70	3.02±0.84	1.60±0.55	2.94±0.64	1.35±0.70	1.36±0.75	Sign
Language development	10.55±1.26	13.67±1.65	11.02±1.64	12.87±1.43	10.69±1.51	10.91±1.66	Sign
The concept of number and time	5.36±0.16	7.11±0.19	5.74±0.51	6.55±0.64	5.70±0.81	5.77±0.90	Sign
Household chores	4.84±1.02	7.00±1.29	5.11±1.22	6.27±1.08	5.02±1.11	5.11±1.26	Sign
Vocational activity	4.06±1.11	7.05±1.67	4.11±1.26	6.14±1.81	4.12±2.01	4.12±2.09	Sign
Self Directed	5.49±1.23	8.47±2.01	5.08±1.37	7.91±1.78	5.24±1.75	5.55±1.44	Sign
Responsibility	6.37±0.78	9.58±1.06	6.41±0.88	9.22±1.15	6.31±1.36	6.40±1.41	Sign
Social normalization	7.65±1.25	10.22±1.00	7.74±1.30	10.26±1.32	7.78±1.40	7.80±1.36	Sign

The F-test showed Statistically significant differences between the pre and post measurements in the Unified group of all scale factors .

Statistically significant differences between the pre and post measurements in the Non-Unified group of all scale factors.

Statistically significant differences between the post measurements in the Unified group and control group of all scale factors

Statistically significant differences between the post measurements in the non- Unified group and control group of all scale factors

Not Statistically significant differences between post measurements in the Unified group and non-Unified group of all scale factors**.**

Table 2. Mean ± SD, change rate and "F" sign. Among the three groups in physical variables and scout skills

Variables	Unified scout		Non-unified scout		Control		sign
	Pre	Post	Pre	Post	Pre	Post	
20m running	5.11±0.03	5.01±0.08	5.10±0.07	5.07±0.07	5.09±0.05	5.10±0.10	sign
Threw a light ball	2.15±0.09	2.32±0.10	2.17±0.13	2.28±0.12	2.16±0.13	2.18±0.17	sign
Standing long jump	1.11±0.12	1.27±0.14	1.13±0.11	1.22±0.13	1.13±0.15	1.15±0.12	sign
Scout skills	2.01±0.12	5.18±1.02	1.97±1.10	4.26±1.22	1.99±1.03	2.02±1.14	sign

The F-test showed statistically significant differences between the pre and post measurements in the Unified group of all physical variables and scout skills.

Statistically significant differences between the pre and post measurements in the Non-Unified group of all physical variables and scout skills.

Statistically significant differences between the post measurements in the Unified group and control group in all physical variables and scout skills.

Statistically significant differences between the post measurements in the non- Unified group and control group of all physical variables and scout skills.

Not Statistically significant differences between post measurements in the Unified group and non-Unified group of all physical variables and scout skills**.**

Discussion

There is a special fellowship gained from belonging to a Scouting unit—a pack, a troop, a team, a crew, or a group. The rewards of Scouting—fun, pride in accomplishment, satisfaction in service - Can be just as great for a child with mental challenges as for all youth.

A child needs immediate recognition of their advancement. A simple thing like applause provides amazing motivation for youth. (Boy Scouts of America. 2007)

Because progress for many youth with mental challenges is often slow, immediate recognition of their progress can keep interest from lagging. Immediate recognition is critical. You can read a description of the recognitions available in the Should a child with mental challenges belong to a unit with nondisabled children? Or would they be better helped as a member of a special unit, one organized especially to serve the Scouts with mental challenges? (Kephart, 1987)

Experience confirms it is possible to place a youth with moderate mental challenges in a regular unit.

This provides the child an opportunity for helpful association in a "normal" environment. However, both adult and youth leaders should be given adequate background information on their condition and an orientation before the child joins the unit.

Youth members and leaders of the unit must understand their responsibility to be friendly, kind, and helpful, but not overprotective of the youth with mental challenges. Often, the other members of the unit are so eager to help that their assistance to a buddy must be carefully defined. As a rule, only a few youth with mental challenges should be in a regular unit, because the average leader is unable to give adequate time for their special needs if the number is too large. If there are three or more boys with mental challenges, additional adult leadership must be provided. If possible, one or both parents should be involved with the unit.

Many leaders who have had experience with children with severe mental challenges have found that a better program can be carried out in a unit formed especially for these youth. This makes possible a slower-paced program geared to their learning abilities. Shorter activity sessions that do not extend beyond the limited attention span for the group can be planned. (Boy Scouts of America. 2007)

Youth in special units should make helpful contacts with those units of Scouts without disabilities. Leaders can arrange opportunities for interaction.

All Scouting members—leaders and youth—profit by following this part of the interpretation of the Scout Law: A Scout is friendly—a friend to all; he is a brother to other Scouts; he seeks to under-stand others. While brotherhood is promoted on an international scale in Scouting, it also happens when Scouts participate together in summer camp, district and council activities, and interunit visits. (Boy Scouts of America. 2007)

Conclusion

Boy Scout and Girl Scout groups can be good sources of partners

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THE IMPORTANCE OF MENTAL AND PHYSICAL RELAXATION IN TREATING SLEEP DISORDERS

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Abstract
Chronic insomnia is the most common form of a sleep disorder, to which, however, is not given the proper importance. This research comprised 14 subjects with various forms of insomnia, on whom an anti-stress massage intervention was performed, over the course of three months.
The results proved that insomnia and its associated symptoms have been removed, the subjects' general state of health, and, implicitly, the quality of their lives has improved.
Key words: insomnia, relaxation, anti-stress massage.

Introduction

"Sleep represents a normal and periodical physiological state of rest http://www.archeus.ro/lingvistica/CautareDex?query=REPAUSof living beings, necessary for recovering their strength, characterized by a total or partial stop in the functioning of their consciousness, through muscle relaxation, http://www.archeus.ro/lingvistica/CautareDex?query=PRIN slowing of the circulation, of the breathing and through dreams" (http://www.archeus.ro/lingvistica).

A normal sleep, from the point of view of duration, is considered to take more than 7 hours, and less than 9 hours, per night. Less than 7 hours suggests inadequate sleeping, and over 9 hours suggests primary hypersomnia (a state of excessive daytime somnolence), but this not a strict rule, because there are individual variations in the sleep time.

"As modern civilization is considerably different from the traditional, pre-industrial civilizations, we must not be surprised that, for this reason, the pathologies of modern civilization are also different from the preceding civilizations.... In this context, we must not be surprised by the tremendous impact this radical change in environment had on our health, or, as a consequence, by the changes in the human pathology. Among the many diseases of the century, the most frequent ones are atherosclerosis and insomnia" (Percek, 1991).

A highly regarded expert in this field, professor Thomas Roth, of Detroit, USA, writes that "30% of the world population suffers from common insomnia, which is a true plague of our times." In his turn, prof. Liviu Popoviciu, from the Institute of Medicine of Târgu Mureş, emphasized the fact that "insomnia has become today a special, if not a very serious problem. One that could not be imagined a century ago." (Percek, 1991)

Throughout most of the modern age, the medicine of sleep suffered from a lack of a comprising, largely accepted and used definition of insomnia. There are, however, a few "components that can be considered for a general definition of insomnia, including (Sateia, Buysse, 2010):

- The symptomatic profile - most definitions included in the medical history troubles of falling asleep and of staying asleep, later including waking up early. There are debates whether unresting sleep should be included in this definition.
- The chronic element - most modern definitions differentiated between acute and chronic insomnia, although the exact time period that separates them varies significantly, from two weeks to six months.
- The subjective versus the objective researches
- Even though it was an admitted fact for a long time that insomnia is in many ways a very subjective experience, some researchers in several clinical approaches tried to define insomnia using objectives parameters, such as sleep latency, the number of times the patient woke up, the waking up period after the beginning of sleep, or after the total time of sleep. Currently, the objective-quantitative criteria are top of the list in research, while the clinical diagnosis criterion is based only on the subjective aspects.
- The frequency - there is a large variety of opinions regarding whether the frequency criterion should be taken into consideration. Currently, neither the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM- IV), nor the International Classification of Sleep Disorders, 2nd edition (ICSD - 2) do not include the frequency criterion.
- The consequences during the day"

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As the field of sleep medicine has matured in the last two decades, it has become increasingly clear that sleep interruption or lacking a normal sleep have rapid adverse consequences. Chronic insomnia is the most common form of a sleep disorder, to which, however, is not given the proper importance, being considered more of a benign existential problem than a disorder that requires serious medical attention. Still, "investigations on chronic insomnia, conducted over the last 20 years, emphasize how important it is to address this problem as a component of a patient's general health. It is not only clear that chronic insomnia is associated with the injuring of the quality of life..., but the newest data show that insomnia can be a significant risk factor for the development of major physical and psychiatric problems" (Sateia, Buysse, 2010).

In the modern age, medicine has gradually progressed toward a multi-determining model of the causes for illness, and toward a multimodal treatment. It has become increasingly clearer that sleep is one of the factors determining health and the state of wellbeing. It is no longer possible for the scientists to study diseases effectively, or for the physicians to treat them effectively, without taking into consideration the role played by sleep and circadian factors in ensuring a good state of health.

Over the last 20 years, great progress has been made in understanding the nature and characteristics of chronic insomnia, and in the medical world's ability to evaluate exactly and to treat this problem. This progress has changed profoundly the way in which chronic insomnia is regarded, and most importantly, it has changed the way in which it is considered, from a secondary symptom for other disorders, to an illness that appears concomitantly with other disorders. This change is important because "chronic insomnia appears very often concomitantly with other physical or psychiatric illnesses. This perspective suggests that chronic insomnia is manifested through its unique and somewhat independent physiopathology that is not only influenced by concomitant disorders, but it also has a major influence on them" (Sateia & Buysse, 2010).

As Horne, 2008, writes, "it is remarkable that, despite the wide acceptance that sleep disorders are caused by psychological factors, the treatments were, unfortunately, mostly pharmacological in nature. Opiates, alcohol, and herbs such as Valerian, were most probably used in treating insomnia, in Greek and Sumerian civilizations. The therapies most used in the first half of the 20th century were based on barbiturates. The discovery of benzodiazepine, in 1960, was at the basis of the current pharmacological approach of insomnia."

The exact causes of insomnia are less known, but in general terms, the etiology of insomnia implies a combination of biological, psychological, and social factors. "Insomnia is conceptualized as a state of hyperexcitation" (Perlis et al., 2005). It is believed that stress plays a main role in activating the hypothalamic and pituitary gland, and in producing the conditions for the appearance of chronic insomnia. A survey has shown that "adults with insomnia, compared with the ones with a normal sleep (after a 24 h period), have an increased level of cortisol and adrenocorticotropic hormone (ACTH) response, released by the hypothalamic–pituitary–adrenal gland after stress exposure" (Vgontzas et al., 2001). The cortisol and ACTH secretion model for 24 hours is different, however, from the one in the persons who are chronically stressed. Partinen & Hublin (as cited in Colten & Altevogt, 2006) write that: "The cognitive factors, such as worrying, meditation, and fear of not falling asleep, continue to maintain the problem through behavioral conditioning. Other perpetuating factors include slight exposures and unstable sleep programs."

Patients with insomnia often attribute their condition to a hyperactive brain. Several evidence from pre-clinical studies to neuro-imagistic studies of sleep in patients with insomnia, suggests that there are multiple neural systems hierarchically arranged in the CNS that contribute to the excitation just as the discontents caused by insomnia. Nofzinger et al. (as cited in Colten & Altevogt, 2006), think that "the structures that regulate sleep and being awake states, such as the brainstem, the hypothalamus, and the base of the anterior side of the brain, are abnormally active during sleep in the patients with primary insomnia. The abnormal activity in the neocortical structures that control the executive function and is responsible of a modulating behavior, linked to excitation and basic emotions, has been observed in people who suffer from insomnia associated with depression."

According to Edinger & Means 2005, "the main risk factors for insomnia appear in elderly people and women."

Ford & Kamerow (as cited in Colten & Altevogt, 2006), show that "an important study highlights a double number of women suffering from insomnia, compared with the men, although there is the possibility that the results were influenced by a certain prejudice." The reason behind the apparent larger predominance in women is not understood, but most hypotheses incline toward the endocrine differences. Other risk factors for insomnia include "the history of insomnia inside the family" (Dauvilliers et al., 2005), "a stressful lifestyle, physical and psychiatric disorders, but also working in shifts" (Edinger & Means, 2005).

The earliest study on insomnia, from the modern age, was published by Bixler et al., in 1979. In this study, approximately 1000 Los Angeles area residents were interviewed, "finding a prevalence of insomnia of 42.5%" (Sateia & Buysse, 2010). The survey referred to insomnia exclusively as a symptom.

Since then, the epidemiological studies have become increasingly sophisticated, including criteria that evaluate the profile of the symptoms, the frequency, the severity, the consequences, and other characteristics. Once this progress happened, the recorded data modified, and the high percentage described by Bixler diminished.

Currently, the clear tendency in the epidemiological research is toward the consequences during the day, and toward the criterion of applying the final diagnosis.

"A study conducted on almost 25000 Europeans shows that 16.8% of the interviewed subjects reported one or more symptoms of insomnia (difficulty in falling asleep, or staying asleep, or an unresting sleep). The addition of the criterion referring to the repetition of insomnia over the course of one month reduces the percentage to 15.8, while the supplementary demand referring to the associated consequences during the day, adds to 11.1%, meeting all the other three criteria. Similar results have been recorded in the Canadian population, starting from the initial criterion of unresting sleep (17.8%). The addition of the criterion referring to the presence of a symptom of insomnia (trouble falling asleep and/or staying asleep) got a result of 11.2%. The addition of the criterion of duration and consequences during the day reduced the percentage to 4-5" (Sateia & Buysse, 2010).

Due to its chronic nature, insomnia is associated with substantial insufficiencies in an individual's quality of life. In several studies, "the insomniacs reported a drop in the quality of their lives," in practically all of the 36 points of the SF-36 study (Short Form Health Survey of the Medical Outcomes Study), which taps eight health concepts: physical functioning, role limitations due to physical health problems, bodily pain, general health perceptions, energy/fatigue, social functioning, role limitations due to personal or emotional problems, and emotional well-being. Another study compared the SF-36 results for the groups with severe and mild insomnia, with the results for the groups of patients diagnosed with depression and congestive heart failure. "The patients with severe insomnia had a larger number of functional disorders than the ones with congestive heart failure, among numerous other emotional and mental health effects" (Colten & Altevogt, 2006).

Methods and Procedures

This study aimed to identify certain possibilities of therapeutic intervention in the case of sleep disorders, other than drug therapy. As such, the following hypotheses have been established:

- Presumably, the use of anti-stress massage, correctly adapted to the needs of each patient's body, can determine the improvement of the quality of sleep, and considerably diminish the symptoms associated with insomnia.
- Presumably, the improvement of the quality of sleep and the diminishing/ disappearance of the symptoms associated with insomnia will determine an increase in the quality of life of the patients benefiting from the anti-stress massage.

The research was conducted on a group of 14 subjects (10 women and 4 men), between 22 and 45 years old, with various forms of sleep disorders (transient insomnia, Sleep Onset Insomnia, Sleep Maintenance Insomnia, Early Morning Awakening Insomnia).

The necessary information were obtained directly from the subjects, by applying a **Insomnia Evaluation Questionnaire** (http://www.sleepmedcenter.com) (Annex 1), which tried to assess the following aspects: the description of the sleep disorder, its origins and history, the insufficiencies (the measure in which insomnia affects the quality of life), the treatments (past or current), the patient's current state of health in relation to insomnia.

Even if most answers to the above-mentioned questionnaire consisted in simply choosing certain attributes corresponding to each item, the answers to some of the questions needed a clear specification, such as: How long does it usually take you to fall asleep? (minutes); How many times do you wake up during the night?; How long are you usually awake after waking up at night? (minutes); On how many nights during an average week do you experience sleep difficulties?; How long did you have sleep disorders? (weeks, months).

After clarifying the initial status, an intervention program was established, based on three anti-stress massage sessions per week. This program was applied over the course of three months.

"The anti-stress massage is a massage of re-balancing the psyche and the body and of setting them at a level that would ensure a state of well-being. It is a massage of reintegration of the body scheme, of relaxation, of restructuring the personal history. The movements are fluid, enveloping, and successive, like one movement that goes over the entire body, following its shapes and contours. The anti-stress massage aims to reestablish the unity of the body, mind, and psycho-behavior, linking these elements between them. Anti-stress massage determines the rediscovering of the body parts, through a reunification and re-harmonization of the receptive and active parts of the body, thus forming an axis that balances the whole organism." (Mârza, 2005).

All the 22 specific anti-stress massage tracks were applied, through successive approach, but also according to the needs, adapting the intervention to the each person's current mood. Each session took between 30 minutes and one hour.

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Generally, starting from the similar symptoms reported by the subjects, the following goals for the massage intervention were established:

- Diminishing the sleepiness and fatigue;
- Preventing depression and anxiety;
- Improving the quality of life;
- Increasing the ability to function at work;
- Eliminating the physical and mental discomfort.

Figure 1. Pictures taken during the application of the anti-stress massage therapy

Results

In the initial testing, the subjects reported very often difficulties in staying asleep, frequent sleepiness during the day, physical discomfort, psychological tension due to thoughts and worries appeared during the periods when they could not sleep, muscle tensions associated to the psychological ones, states of irritability, and, variably, states of anxiety and depression. Because of these disorders, all of them reported a drop in their ability to function at work, frequent mood changes, memory troubles, and a decreased ability to focus. All the subjects have initially reported a gradual decease in their interest for any kind of activity, in their appetite, and continual fatigue. Two of the women and two of the men accused even the appearance, during certain moments of the day, of cardiac arrhythmias, dizziness, and sometimes, headaches and gastro-intestinal symptoms.

The presentation of the results is based on the calculated averages for the entire group of subjects, for each of the quantifiable items in the questionnaire. Thus, the following results were obtained:

- The time it took the patients to fall asleep has decreased, from 60 minutes, in average, to 35 minutes, in average (Chart 1).
- The frequency of the wakings per night has decreased, from 5, in average, to one, in average (Chart 2).
- The time it took the patients to remain awake, after waking up during the night, has decreased, from 60 minutes, in average, to 15 minutes, in average (Chart 3).
- The frequency of insomnias per week has decreased, from 5, in average, to 1, in average (Chart 4).

In the final assessment, the answers given to the questionnaire have shown that all the symptoms associated with insomnia that were initially reported, have considerably diminished, or even disappeared, the subjects being aware of a clear improvement in the quality of their lives.

The application of anti-stress massage determined a mental relaxation in the subjects, leading to an improvement in their moods and their trust in themselves and in the ones around them, this determining the improvement of work performances, social and family relations. Also, the psychological relaxation obtained through the anti-stress massage allowed the gradual diminish of the impact of negative images from the past, and the new situations to be approached in a less stressful manner, this being a very important step forward in the patients' stress management.

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Discussions

During time, sleep disorders were studied and the studies conducted in this area established, on experimental basis, different ways of terapheutic intervention (Benca, 2005; Edinger, Means, 2005; Perlis, Smith, Pigeon, 2005; Sateia, Buisse, 2010), but, in the specialty literature, it cannot be found any reference about experiments that have as an objective studying the efects of anti-stress massage on subjects suffering of sleep disorders.

The ending of the study and the obtained results allow us to see the measure in which the initial hypotheses have been confirmed or not; thus:

1. The hypothesis stating that the use of anti-stress massage, correctly adapted to the needs of each patient's body, can determine the improvement of the quality of sleep, and considerably diminish the symptoms associated with insomnia was confirmed, the results proving the fact that the sleepiness, the continual fatigue, the mood changes, the troubles of concentration, the social/working troubles, the reduced motivation, the physical and psychological discomfort, have all been reduced or eliminated.
2. The hypothesis stating that the improvement of the quality of sleep and the diminishing/ disappearance of the symptoms associated with insomnia will determine an increase in the quality of life of the patients benefiting from the anti-stress massage was also confirmed, the results proving that the subjects' health has improved.

Conclusion.

The above statements support the following **conclusions**:

- The application of anti-stress massage determined the considerable reduction, up to near elimination, of the sleep disorders and of the associated symptoms.
- The physical and psychological rebalance obtained as a result of the anti-stress massage had influences also on the behavior of the subjects during stressful situations, helping them to manage these situations better.
- The improvement of the quality of sleep, as a result of applying the anti-stress massage, determined the subjects to give up certain treatments they were previously taking.
- As a result of the improvement of the quality of sleep, the subjects' quality of life has also improved, the next-day consequences of insomnia disappearing.
- Once the sleep disorders have been cured, the subjects of the anti-stres massage treatment have also benefited from the removal of certain disorders of the general functionality of the body, which contributed to the improvement of their health, and to the considerable decrease in the risk of getting seriously ill in the near future.

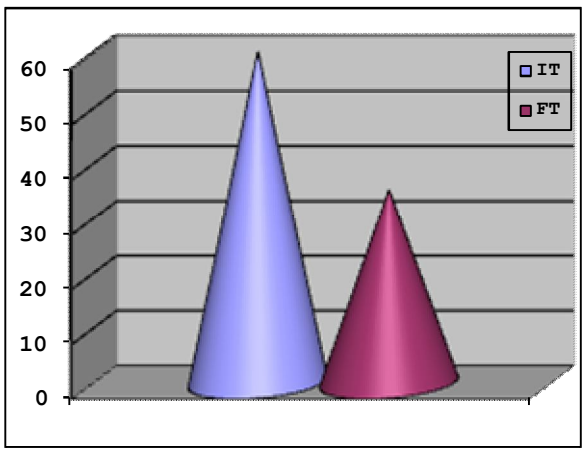

Chart 1. The evolution of the average time to fall asleep

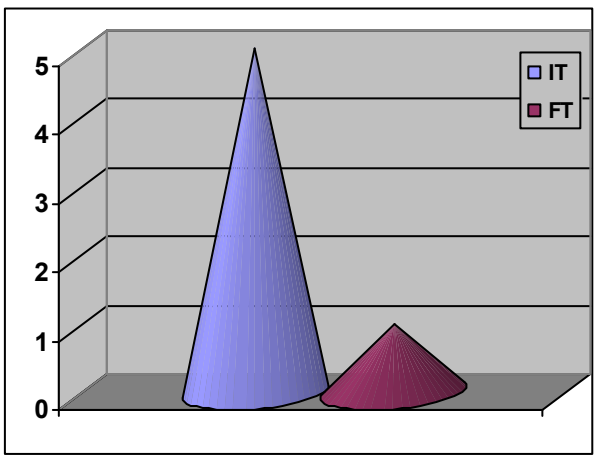

Chart 2. The evolution of the frequency of wakings per night

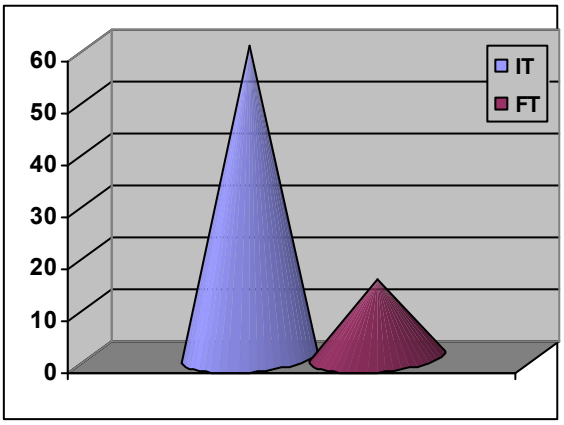

Chart 3. The evolution of the period of time during which the subjects remained awake after waking up during the night

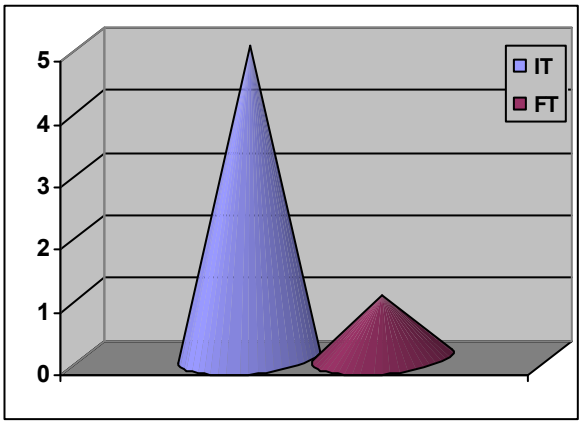

Chart 4. The evolution of the frequency of insomnias per week

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ANNEX 1

Insomnia Evaluation Questionnaire (The Center for Sleep Medicine, Insomnia Treatment and Evaluation Program, 2011, http://www.sleepmedcenter.com)

A. Description of the sleep disorder

1. Do you encounter the following situations:

a. Difficulty in falling asleep;

Never	Rarely	Sometimes	Often	Very often

b. Difficulty staying asleep;

Never	Rarely	Sometimes	Often	Very often

c. Problems waking too early;

Never	Rarely	Sometimes	Often	Very often

d. Sleepiness or difficulty staying awake during the day;

Never	Rarely	Sometimes	Often	Very often

e. Unwanted behaviors during sleep;

Never	Rarely	Sometimes	Often	Very often

f. Nightmares or vivid dreams.

Never	Rarely	Sometimes	Often	Very often

2. How long does it usually take you to fall asleep? _____(minutes)
3. How many times do you wake up during the night? _____
4. How long are you usually awake after waking up at night? _____(minutes)
5. On how many nights during an average week do you experience sleep difficulties? _____
6. How long did you have sleep disorders? _____(months)

B. Origin and history

1. How much do you feel that the following factors may contribute to your sleeping disorders:

a. Mental activity (e.g. racing thoughts, worry about sleep);

Not at all	A little	Much	Very much

b. Physical discomfort (e.g.: muscle tension and pain);

Not at all	A little	Much	Very much

c. Poor sleeping habits;

Not at all	A little	Much	Very much

d. Mood (depression or anxiety);

Not at all	A little	Much	Very much

e. Natural aging (including menopause);

Not at all	A little	Much	Very much

f. A variable sleep schedule;

Not at all	A little	Much	Very much

g. Personal stressors (e.g.: family or relationships);

Not at all	A little	Much	Very much

h. Work stressors (e.g.: work demands, job security);

Not at all	A little	Much	Very much

i. Weight gain or loss;

Not at all	A little	Much	Very much

j. Medication(s);

Not at all	A little	Much	Very much

k. Medical condition(s);

Not at all	A little	Much	Very much

l. Travel schedule.

Not at all	A little	Much	Very much

C. Insufficiencies

1. How affected are you by the sleep disorders?

Not at all	A little	Much	Very much

2. How much do the sleep disorders affect your:

a. Ability to function at work;

Not at all	A little	Much	Very much

b. Family and social relations;

Not at all	A little	Much	Very much

c. Mood;

Not at all	A little	Much	Very much

d. Memory, attention, and concentration;

Not at all	A little	Much	Very much

e. Health.

Not at all	A little	Much	Very much

3. How noticeable to others do you think your sleep problem is?

Not at all	A little	Much	Very much

4. How worried/distressed are you about your current sleep problem?

Not at all	A little	Much	Very much

D. Treatments

What kinds of approaches you are have tried in the past or are currently using toaddress your sleep problem:

1. Alcohol;

Past use	Current use

2. Over-the-Counter sleep aids;

Past use	Current use

3. Prescription sleep aids;

Past use	Current use

4. Melatonin;

Past use	Current use

5. Herbal Supplements/Tea (e.g. Gingko Biloba, Valerian Root);

Past use	Current use

6. Other controlled substances (e.g. Marijuana);

Past use	Current use

7. Self Help Literature (e.g. books, pamphlets about insomnia);

Past use	Current use

8. Relaxation Exercises/Yoga/Meditation;

Past use	Current use

9. Cognitive Behavioral Treatment;

Past use	Current use

10. Psychotherapy.

Past use	Current use

E. Brief Patient Health Questionnaire

1. Over the last 2-weeks, how often have you been bothered by any of the following problems?

a. Little interest or pleasure in doing things

Not at all	Several days	More than half the days	Nearly everyday

b. Feeling down, depressed or hopeless;

Not at all	Several days	More than half the days	Nearly everyday

c. Poor appetite or overeating;

Not at all	Several days	More than half the days	Nearly everyday

d. Feeling tired or having little energy;

Not at all	Several days	More than half the days	Nearly everyday

e. Trouble falling or staying asleep; sleeping too much;

Not at all	Several days	More than half the days	Nearly everyday

f. A drop in self-confidence;

Not at all	Several days	More than half the days	Nearly everyday

g. Trouble concentrating on things, even on simple activities;

Not at all	Several days	More than half the days	Nearly everyday

h. Hyper or hypo-activity states;

Not at all	Several days	More than half the days	Nearly everyday

i. Suicidal or self-mutilation thoughts

Not at all	Several days	More than half the days	Nearly everyday

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EXCESS IN SPORT AND ITS CONSEQUENCES – TRAUMAS KNEE INJURIES

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Abstract

*Purpose.*The starting point of the present study is the idea that the high trauma incidence among the studied competitive sportsmen is caused by factors that can be controlled at least partially through primary prevention methods.

Material and methods: The study was performed on a batch of 155 sportsmen who practised athletics, basketball, handball, football and volleyball. The sportsmen were between 13- 42 years old and had been practising sports for 4-20 years. The study covered three years of competitions: (August 2006 – July 2009).

Purpose: To reduce the number of traumas in the studied sportsmen through the identification of risk factors and the introduction of prevention exercises and stretching techniques exercises in the training programme, both during warm-up and in post-effort rehabilitation, in order to prevent injuries and increase performance

This article deals only with data regarding knee injuries.

*Results.*The statistical comparison of the results revealed that in the second period (August 2008 – July 2009), when the exercise programme was followed in a systematic, organised and dynamic manner both during warm-up and post-effort rehabilitation, the incidence of locomotor traumas affecting whole batch of sportsmen decreased significantly (**with 25.18%**) as compared with the first period. The number of knee traumas decreased significantly within the 23-26, 13-18 and 19-22 age groups ($p = 0.0011$; $\alpha = 0.001$).

The number of knee traumas decreased significantly in the second period as compared to the first, in all years of practice groups, except for the > 20 group, which showed only minor differences. Two sportsmen were included in this longevity category.

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Conclusions

- High incidence of medium severity macrotraumas – 1st and 2nd degree sprains and muscular elongations, compared with severe macrotraumas – 3rd degree sprains, which corresponds to the data in the sports-related literature.
- The utility, necessity and beneficial effects of the prevention exercises included in the training programme have been proved.
- The performance level and the number of training sessions influence the high number of traumas that occurred.
- The extrinsic factors have a stronger influence.

Key words: sportsmen, traumas, knee, prevention, rehabilitation.

Introduction

An injury, irrespective of its cause, may be of critical consequence in a sportsman's life.
Overstress imposed by high performance and the imbalance between the mechanic overstress and the functional resistance of the tissues are the causes of the high incidence of joint traumas in the studied batches.

Research objectives

- To determine musculo-skeletal trauma incidence, frequency and location by the affected segment in the studied sportsmen;
- to identify and reduce the internal and external factors that cause traumas in sportsmen;
- to develop and apply prevention exercises;
- to detect musculo-skeletal traumas early, using modern investigation methods: musculo-skeletal ultrasound scan, MRI, CT.

Material and methods

The study batch included 155 sportsmen (52 (33.5%) female and 103 (66.5%) male) who practised athletics, basketball, handball, football and volleyball. The sportsmen were between 13 and 42 years old and had been practising sports for 4-20 years. The study covered three competition years (August 2006 – July 2009).

Methods for preventing traumas in sportsmen

The following research methods were used: scientific documentation, observation, experiments, conversations, questionnaires, MRI, CT, statistic and graphic methods (Rinderu, 2005; Kontonopoulou, Xidea-Kkemeni, 2004; Mircioaga, 2009). The sportsmen were monitored both while training and during competitions through video recordings, questionnaires, and observation and conversation conducted by medical sportsmen and kinetic therapy experts. The injured sportsmen were examined clinically and imagistically (radiology, ultrasound scan and in severe traumas also MRI). Starting with **August 2008**, the sportsmen followed a complex and coherent programme of exercises focused on muscle groups and joints that are usually involved in the specific movements of sport games and athletics. (Mircioaga, 2009).

(The statistical processing included:

- the comparison of the average values: the "t" (Student) test was used for pairs of independent batches and a significance (risk) level of 0.05 (5%); the "F" test was used to compare more than two batches (the ANOVA model**)** (8) Mihalaş, Lungeanu, 1998; Baron, Anghelache, Titan, 1995;
- regression and statistic correlation: linear regression and the Pearson coefficient;
- the Z test

Results

❖ The musculo-skeletal traumas that occurred in 11 body segments (forearm, thigh, elbow, spine, face, calf, **knee**, ankle, hand (palm, fist), foot and shoulder) both before and after introducing the prevention programme were all registered.

❖ In order to reveal the importance of the prevention programme, the shares of the type of injuries affecting the whole batch between the two periods were compared.

This article deals only with data regarding knee injuries.

Comparisons by age groups and affected body segments

In order to compare the percentage values in each age group between the two periods, the Z test was applied. The following table shows the p values and the significance of the comparisons:

Table 1. Comparison of trauma shares by age groups and body segment

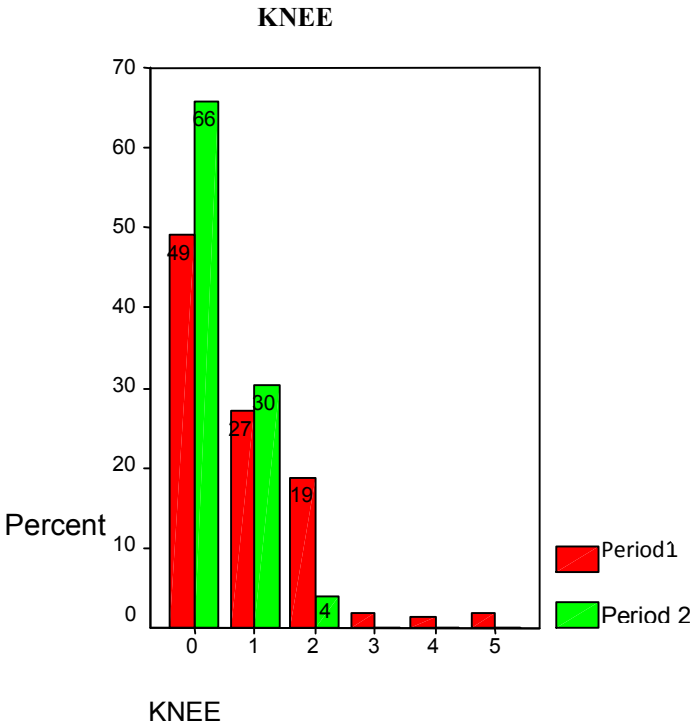
Age group	p value and significance Thigh	Spine	Knee	Ankle	Shoulder	p value and significance Forearm	Face	Foot
13-18 years	0.475 ns	0.08 ns	<0.001 s	0.033 s	0.138 ns	0.99 ns	0.607 ns	0.99 ns
19-22 years	0.063 ns	0.49 ns	<0.001 s	0.0014 s	0.99 ns	0.995 ns	0.499 ns	0.717 ns
23-26 years	0.34 ns	0.99 ns	0.0011 s	0.08 ns	0.916 ns	0.617 ns	0.99 ns	0.558 ns
27-30	0.194 ns	0.99 ns	0.214	0.99 ns	0.99 ns	0.934 ns	0.99	0.908

years > 30 years	**0.386 ns**	**0.99 ns**	**0.99 ns**	**0.99 ns**	**0.386 ns**	**0.951 ns**	**0.99 ns**	**0.99 ns**

In Period 2, the number of traumas decreased in all segments and age groups, **except for** the ankle traumas, which **increased** a little within the **27-30 age group** ($p = 0.99$, $\alpha = 0.05$).
The table shows that the incidence of **thigh**, **spine** and **shoulder** traumas decreased slightly in the second period as compared to the first.
Knee injuries decreased **significantly** within the 23-26, 13-18 and 19-22 age groups ($p = 0.0011$, $\alpha = 0.001$)
Ankle injuries decreased **significantly** ($p = 0.033$, $\alpha = 0.05$) within the 13-18 ($p = 0.0014$, $\alpha = 0.01$) and the 19-22 age groups.

The incidence of **forearm, face and foot** traumas decreased only a little; as a rule, the general number of traumas decreased, ***except for*** the 19-22 and 23-26 age groups, where the number of **foot** injuries increased slightly in **period 2**.

Distribution of musculo-skeletal traumas by affected segment and maximum numberof traumas (1-5 traumas/sportsmen/segment) against the whole batch (= 155) a comparison of the two studied periods



Graphic 1. KNEE trauma distribution (%) (0 -5 traumas) on the two studied time periods

Period 1
42 sportsmen (27.1%) suffered **1** knee trauma in August 2006 – July 2008.
29 sportsmen (18.71%) suffered **2** knee traumas in August 2006 – July 2008.
3 sportsmen (1.94%) suffered **3** knee traumas in August 2006 – July 2008.
2 sportsmen (1.29%) suffered **4** knee traumas in August 2006 – July 2008.
3 sportsmen (1.94%) suffered **5** knee traumas in August 2006 – July 2008.

Period 2
47 sportsmen (30.32%) suffered **1** knee trauma in August 2008 - July 2009.
6 sportsmen (3.87%) suffered **2** knee traumas in August 2008 - July 2009.
It should be noticed that in the second period the number of knee traumas was smaller among the sportsmen with relapses (2-5 traumas), while the number of injured sportsmen decreased from 79 to 53 (-26) in the same period.

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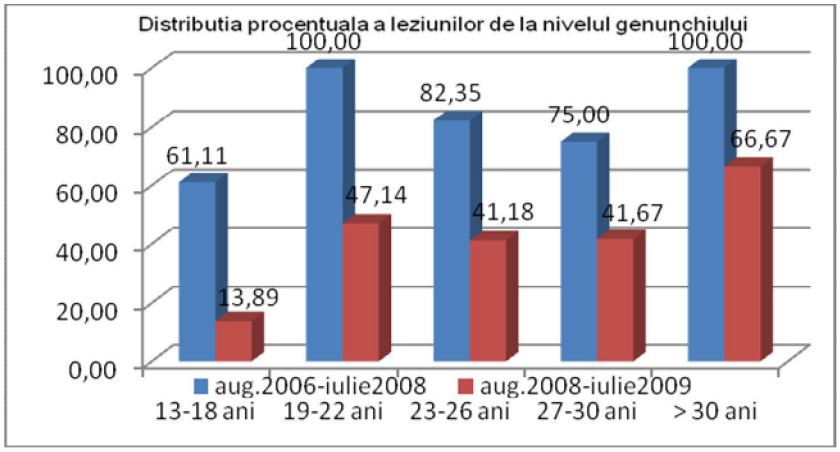
Table 2. Percentage distribution of knee trauma
COMPARISONS BY AGE GROUPS AND AFFECTED SEGMENTS - KNEE

	KNEE			
	Age group	**Number of traumas**	**Trauma %**	**Total sportsmen**
Period 1	13-18 years	22	61.11	36
	19-22 years	**70**	**100.00**	**70**
	23-26 years	28	82.35	34
	27-30 years	9	75.00	12
	> 30 years	3	100.00	3
		132	85.16	**155**
Period 2	13-18 years	5	13.89	36
	19-22 years	33	47.14	70
	23-26 years	14	41.18	34
	27-30 years	5	41.67	12
	> 30 years	2	66.67	3
		59	38.06	**155**

Percentage distribution of musculo-skeletal traumas by affected segmentand age groups, against the whole batch, irrespective of sex or sport;a comparison of the two studied periods

As there are significant differences in knee lesions by age groups, it is necessary to compare the age groups to determine which of them shows the most important differences.

Period 1: significantly less knee lesions in the 13-18 age group than in the 19-22 group ($p = 0.001$, $\alpha = 0.001$)
Period 2: significantly less knee lesions in the 13-18 age group than in the 19-22 group ($p = 0.0011$, $\alpha = 0.01$)
Period 2: significantly less knee lesions in the 13-18 age group than in the 23-26 group ($p = 0.022$, $\alpha = 0.05$)



Graphic 2. A comparison of the percentage distribution of knee traumas by age groups in the two studied periods

COMPARISONS ON YEARS OF PRACTICE GROUPS AND AFFECTED SEGMENTS – KNEE –
Percentage distribution of musculo-skeletal traumas by affected segment and years of practice groups, against the whole batch, irrespective of sex or sport; a comparison of the two studied periods.

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Table 3. Percentage distribution of knee traumas by years of practice groups in the two studied periods

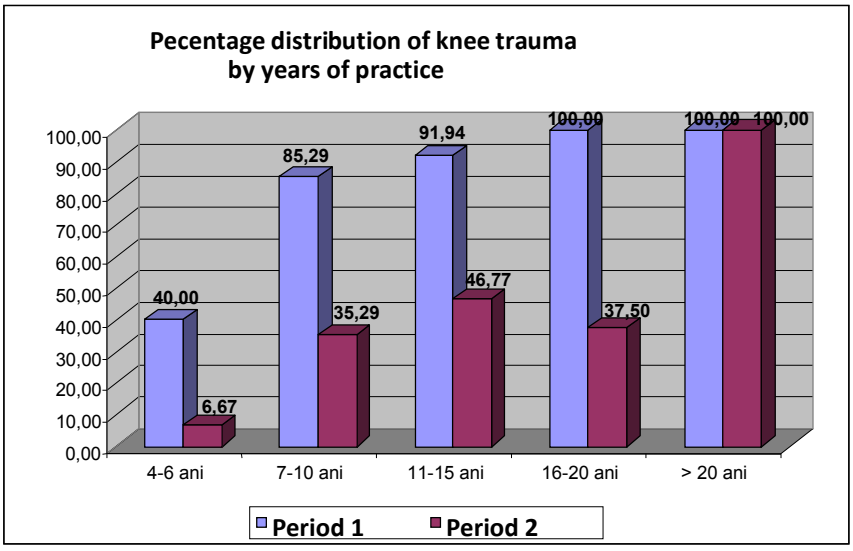
	KNEE			
	Years of practice	**Number of traumas**	**Trauma %**	**Total sportsmen**
Period 1	4-6	6	40.00	15
	7-10	**58**	**85.29**	**68**
	11-15	**58**	**91.94**	**62**
	16-20	8	100	8
	> 20	2	100	2
	Total	**132**	84.52	**155**
Period 2	4-6	1	6.67	15
	7-10	**24**	**35.29**	**68**
	11-15	**29**	**46.77**	**62**
	16-20	3	37.5	8
	> 20	2	100	2
	Total	**59**	38.06	**155**

For the first studied period, the **knee** trauma comparisons between the years of practice groups were made with the χ^2 test; the results were $p < 0.001$, with a significance threshold of $\alpha = 0.001$, which indicates **significant differences** between these groups. The comparison between the numbers of traumas by years of practice groups led to the following results:

- there are significantly less traumas in the 4-6 years of practice group than in the 7-10 group ($p < 0.001$, $\alpha = 0.001$)
- there are significantly less traumas in the 4-6 years of practice group than in the 11-15 group ($p < 0.001$, $\alpha = 0.001$)
- there are significantly less traumas in the 4-6 years of practice group than in the 16-20 group ($p = 0.018$, $\alpha = 0.05$). The rest of the differences are not important.

For the second studied period, the **knee** trauma comparisons between the years of practice groups were made with the χ^2 test; the results were $p = 0.019$, with a significance threshold of $\alpha = 0.05$, which indicates **significant differences** between these groups. The comparison between the number of traumas by years of practice groups led to the following results:

- there are significantly less traumas in the 4-6 years of practice group than in the 7-10 group ($p = 0.03$, $\alpha = 0.05$ - there are significantly less traumas in the 4-6 years of practice group than in the 11-15 group ($p = 0.01$, $\alpha = 0.05$ - there are significantly less traumas in the 4-6 years of practice group than in the > 20 group ($p = 0.023$, $\alpha = 0.05$
- there are significantly less traumas in the 11-15 years of practice group than in the > 20 group($p = 0.013$, $= 0.05$). The remaining differences are unimportant.



Graphic 3 Pecentage distribution of knee traum by years of practice

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In order to compare the percentage values for each years of practice group in the two periods, the Z test was applied and the following results were obtained:

Table 4

Years of practice	p value and significance	α significance threshold
4-6	0,042^{s}	0.05
7-10	<0,001 ^{s}	0.001
11-15	<0,001 ^{s}	0.001
16-20	0,03 ^{s}	0.05
> 20	0,99 ^{ns}	0.05

Discussions

The number of **knee** traumas **decreased significantly in the second period** as compared to the first, in all years of practice groups, except for the > 20 group, which showed only minor differences. Two sportsmen were included in this longevity category.

Distribution of joint traumas in the studied batches:

- In the **handball** and **volleyball** batches, the **knee joint** lesions are far more common than in the **basketball** batch**.**
- In **basketball** and **handball**, the most frequent lesions are knee and ankle sprains that cause meniscus and muscle injuries in most cases.
- **Track and field events:** the number of knee traumas ($p = 0.001$; $\alpha = 0.01$) decreased considerably in 2008-2009 compared with 2006-2008.
- **Football:** the number of knee traumas ($p = 0.007$; $\alpha = 0.01$) decreased significantly.

The comparison between trauma percentages in athletes and football players had the following significant results: knee ($p < 0.001$; $\alpha = 0.001$). Trauma incidence was considerably reduced in football players than in athletes.

The overtraining imposed by competitiveness and the imbalance between the mechanic overstress and the functional resistance of the tissues are the causes of the high incidence of knee trauma in the studied batches.

The literature of the field indicates that as far as volleyball injuries are concerned, 90% of the sportsmen treated in a metropolitan clinic had injuries of the lower extremities, while 59% of them suffered from knee traumas (Gerberich et al., 1987). Avramescu et al. (2006) which confirms the results of our study, that points us an average injuries at the knee and ankle, on both time periods, of 68%. Knee traumas are significantly more frequent in the volleyball batch than in the basketball one. Practically, one cannot play volleyball without jumping which points us to the knee and ankle injury average on both time periods of 68%.

In a study conducted at the team U. PRO VOLLEYBALL CRAIOVA, on a batch of 12 athletes there have been recorded a number of 50 injuries, from which 40% were represented by macrotraumatisme (sprains 50%): hiperfunctionale disease 44% (of which tendinitis 36, 36%). (2)

A 2007 study performed on 116 trauma-suffering sportsmen (in the sportive medicine centre) concluded that over 63% of the injuries were caused by jumps.(INCS)(**2)** Ankle sprain may occur in any sport; however, it is commonly associated with contact and team sports that require jumping or sudden changes of direction. Ankle sprains account for about 35% of all accidents that occurred during basketball, volleyball, football and handball games and training sessions. Once a sportsman has sprained his ankle, he is at high risk of spraining it a second time. In basketball, ankle sprains account for 45% of all traumas. In volleyball, they represent only 25% of the total number of injuries. In 20-40% of cases, ankle sprains cause residual functional sequelae and chronic ankle instability (Kontonopoulou, Xidea-Kkemeni, 2004; Lian et al., 1996).

The overtraining imposed by competitiveness and the imbalance between the mechanic overstress and the functional resistance of the tissues are the causes of the high incidence of knee trauma in the studied batches.

The pathology included the following areas of the body:

- **Knee joint**: sprains, strains, collateral ligament injuries and meniscus tears. The most frequent lesions affected the meniscus (degenerations, fissures, ruptures) and the ligaments (sprains, partial or total ruptures of the cruciate ligament, mostly ACL injuries, ruptures of the collateral ligament). A common injury in volleyball players caused by repeated jumps is patellar tendinitis. The most frequent name of the quadriceps and patellar tendinitis is the **jumper's knee**;

MOST AFFECTED BODY SEGMENTS BY SPORTS

Table 5 Knee:

Period 1		Period 2	
SPORTS			
1. Handball	**128.57 %**	**1. Volleyball**	**55%**
2. Athletics	**116.67 %**	**2. Basketball**	**43.75%**
3. Volleyball	**102.5%**	**3. Handball**	**39.29%**
4. Basketball	**66.67%**	**4. Athletics**	**33.33%**
5. Football	**33, 33%**	**5. Football**	**3.70%**

Conclusions

- high incidence of medium severity macrotraumas – 1st and 2nd degree sprains and muscular elongations, compared with severe macrotraumas – 3rd degree sprains, which corresponds to the data in the sports-related literature.
- Injuries are hard to treat, especially if treatment is not started early. Their treatment can be a simple conservation method or surgery. The best strategy is to avoid injuries. In order to avoid accidents and meet the requirements of the daily training, a series of factors must be taken into account: **prevention exercises, diet, rest, proper warm-up.**
- The utility, necessity and beneficial effects of the prevention exercises included in the training programme have been proved.
- The performance level and the number of training sessions influence the high number of traumas that occurred.
- The extrinsic factors have a stronger influence.
- Research work has revealed the complexity of the physical and psychical changes occurring after traumas in sports. This study has proved the importance of prevention in reducing trauma incidence among the studied sportsmen.

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MASTERY OF GROSS MOTOR SKILLS AMONG PRESCHOOL OBESE CHILDREN

NAFISEH KHALAJ[1, 2], SAIDON AMRI[1]

Abstract
Purpose. Gross motor skills are basis for almost all physical activities. Proper gross motor development among four to six years old children is critical and essential. The aim of this study was to investigate the gross motor skill development of obese children.
Method. Participants were obese (n=40) and normal-weight children (n=40) aged four to six years at kindergartens. Gross motor skills were assessed by using Test of Gross Motor Development second edition. The test was used to assess 12 gross motor skills including six object control and sixlocomotor skills.
Results. The one way ANOVA was used in this study. The results revealed that there was a significant difference at the $p<.05$ level in GMQ between obese and normal weight children [$F(1, 78) = 544.776$, $p=.000$].
Conclusion: Obese children aged four to six years old had poorer gross motor skill performance compare to their normal weight peers.
Key words: preschool children, childhood obesity, gross motor skill.

Introduction

In recent years, the prevalence of childhood obesity has significantly increased(Lob-Corzilius. 2007; Wang ,Lobstein. 2006).It is a growing problem because of its medical complications and psychosocial consequences; especially during childhood (Daniels. 2009; Giugliano ,Carneiro. 2004; Nader, 'Brien, Houts et al. 2006). In addition to medical and psychosocial problems, excess body weight in children is associated with poorer motor development and gross motor skills performance (Graf, Koch, Kretschmann-Kanddel et al. 2004). Mastery of gross motor skills among children is essential to have successful participation in sport, games, and leisure activities (Okely, Booth, Chey. 2004).

Motor development can be defined as development of human fundamental movement patterns and specialized skills and it encompasses human movement abilities and motions that take place through lifespan (Payne ,Isaacs. 2005).

Motor development is classified intotwo types including fine and gross motor development. Fine motor development can be defined as development of precise movements, that use the small muscles to control small movements of the hands, wrists, fingers, feet, toes, lips, and tongue (Payne & Isaacs , 2005; Malina, Bouchard, & Bar-Or, 2004; Gallahue&Ozmun, 1998). Gross motor development can be defined as development of movements that use the large muscles of the body (Gallahue ,Ozmun. 1998), which enables functions such as walking, kicking and throwing.

Early childhood is a critical period to children's development (Hardy, King, Farrell et al. 2010), and considered asa period of rapid changes in all areas of child development, such as gross motor skills. During this period, children's abilities develop noticeably and at the end of this period they can use these abilities to achieve their goals (Shala. 2009). Children acquire new gross motor skills most successfully during preschool and elementary school years (Agnes ,Daniel. 2009); and are able to master these skills with greater ease during this period than any other point in their life (Olrich. 2002).

Gross motor skills provide the infrastructure for learning more complex games, sports, and dance skills in later life (Branta, Haubenstricker, Seefeldt. 1984). The proficiency of gross motor skills is a prerequisite for children to experience success and enjoyment in organized and unorganized movement activities (Woodard ,Surburg. 2001).

In addition, this period is a developmental period during which the majority of children achieve the basic repertoire of locomotor and object control skills (Williams, Pfeiffer, Dowda, Jeter, Jones & Pate, 2009). By this age children acquire some degree of self-consciousness about their gross motor activities which leads to increased feeling of success when they master a new skill (Miller-Keane ,O'Toole. 2005). Failure to master these skills leads to difficulties for children to participate in physical activities and advanced movements, and to achieve adult physical activity levels recommended for health maintenance (Beurden, Zask, Barnett et al. 2002).

Proper development of gross motor skills is considered as an important factor in making sure that children are prepared with the competencies to incorporate and maintain regular physical activities during lifespan (Taggart ,Keegan. 1997).Few studies examined the gross motor development of preschool

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obese children; however, they used different instrument to assess these skills. In addition, more studies are needed to confirm the previous findings. Thus, the purpose of this study was to investigate the gross motor skills performance in preschool obese children by using TGMD-2.

Method

The study was conducted in Qazvin, Iran. Eight kindergartens were randomly selected. Principals of all kindergartens agreed to participate in our study. Parents or guardian of the children were informed about the study, in the case they did not agree, their children were excluded from participation. Finally, a total of 80 children enrolled into this study.

The test of Gross motor development-second edition was used to evaluate gross motor development (Ulrich. 2000).TGMD-2 is a norm and criterion reference instrument which provides a reliable measurement of gross motor development. It evaluate 12 gross motor skills including six locomotor skills (i.e. run, gallop, hop, leap, horizontal jump and slide) and six object control skills (i.e. striking a stationary ball, stationary dribble, catch, kick, overhand throw, and underhand roll) for children aged between 3 and 10.92 (10 years and 11 months) years.

According to TGMD-2 manual, each skill has performance criteria to describe performance quality and mature pattern of the skills, and varied in number from three to five among different motor skills. If the child performed the criterion correctly, a score of one was recorded and if performed incorrectly zero was recorded (Ulrich. 2000). After assessment, the raw scores of each gross motor skill were obtained by summing the scores of the criterion of the two trials.

The raw score of two trials for each skill range from 6 to 10 points. The total raw scores for each of the locomotor and object control skills are obtained separately by summing the scores of the six skills of the two trials which would range from 0 to 48 points. Raw scores would be used to find the age equivalent for both locomotor and object control skills. Also, the two-subset raw scores would be used to find gross motor quotient (GMQ). Raw scores of locomotor and object control skills would be converted to standard scores; and the quantity resulted from summing standard scores could be converted to gross motor quotient (GMQ).

Data collection

The testing period was January and February 2010. All the measurements were conducted in the morning by the principal investigator. Weight and height were measured to calculate body mass index (BMI). All participants were weighed by using the same scale to avoid bias; and weight was measured to the nearest 0.5 kg.

The height of the participants was measured with stadiometer. The height and weight measurement was also carried out with bare foot. After measuring height and weight, BMI was calculated by dividing weight by height squared (kg/m2). The BMI was classified according to the BMI scale adapted by Cole et al in 2000.

Data collection was started by verbal description and showing the participants how to perform each gross motor skill.

The demonstrations were only provided once to avoid teaching. Each participant was asked to perform each skill twice.To avoid bias and injuries during assessment, in each centre participants were put in groups that had maximum 10 members.After 5-minute warm up exercises, the evaluation was started. Each participant was asked to perform each skill twice. The focus of observation was on the presence or absence of the behavioural component of the skill, which are in the TGMD-2 manual. If the child performed the skill incorrectly such as jogged instead of running or weakly throw the ball at the wall, they were asked to repeat the trial with increasing speed or force.

The performance of participants was recorded by a video camera for later analysis. During the object control skills performance, video camerawas fixed in a proper position and angle to record the whole movement. Throughout the locomotor skills, the camera position was changed when it was required to record the entire performance.

Statistical analysis

Data analysis included descriptive analysis and one-way ANOVA. Mean and standard deviation were calculated for all variables. One-way ANOVA was performed to determine the difference in GMQ between obese and normal weight children. All analysis was performed using SPSS (version 17.00). Results were considered significant at level of <0.05.

Results

Descriptive analysis was used to calculate mean and standard deviation for all the variables. Anthropometrics data for the entire participants is shown in table 1. The numbers of participants were 80 including 40 obese (50% female, 50% male) and 40 normal weight (50% female, 50% male). The age is presented in year, and the average age for all the participants is 4 years and 11 months, height is 1.09 meter, weight is 21.16 kg, and BMI is 17.53(kg/m^2).

Table 1. Anthropometric data

	Normal weight			Obese		
	Minimum	Maximum	Mean (SD)	Minimum	Maximum	Mean (SD)
Weight (Kg)	12	24	17.3 (0.4)	21	31.5	25 (0.4)
Height (m)	0.96	1.23	1.09 (0.01)	1.00	1.21	1.1 (0.01)
BMI (kg/m^2)	11.36	16.74	14.39 (0.21)	19.19	23.15	20.67 (0.18)
Age (year)	4.08	6	4.88 (0.07)	4.00	6.00	4.85 (0.09)

Table 2 presents raw scores of locomotor and object control skills, and GMQ data for all the participants. This table provides information on range (maximum and minimum), mean and standard deviation of the mentioned variables.

Table 2.Raw scores and GMQ data

	Normal weight			Obese		
	Minimum	Maximum	Mean (SD)	Minimum	Maximum	Mean (SD)
Raw score-locomotor	26	37	31.78 (0.383)	19	32	23.78 (0.57)
Raw score-object control	22	34	27.55 (0.464)	16	29	20.78 (0.519)
GMQ	97	106	23.78 (0.57)	79	91	85.53 (0.525)

One-way ANOVA was used to find the difference in gross motor quotient (GMQ) between obese children and their normal weight peers. The result of one-way ANOVA is presented in table 3. The result demonstrated that there is a significant difference in score of GMQ, between obese children and their normal weight peers, [F (1, 78) = 544.776, p=.000]

Table 3. Result of one-way ANOVA for GMQ

		Normal weight	Obese	F	p
GMQ	Mean (SD)	100.45(2.31)	85.53(3.32)	9.77	.002

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The mean and standard deviation for age equivalent of object control and locomotor skills of all the participants were calculated according to their weight status (obese and normal weight). The age is presented in year. Figure 1 presents the chronological age and age equivalent for locomotor and objects control skills. Chronological ages of all the participants are presented in order to show the amount of difference that exists between age equivalent and chronological age.

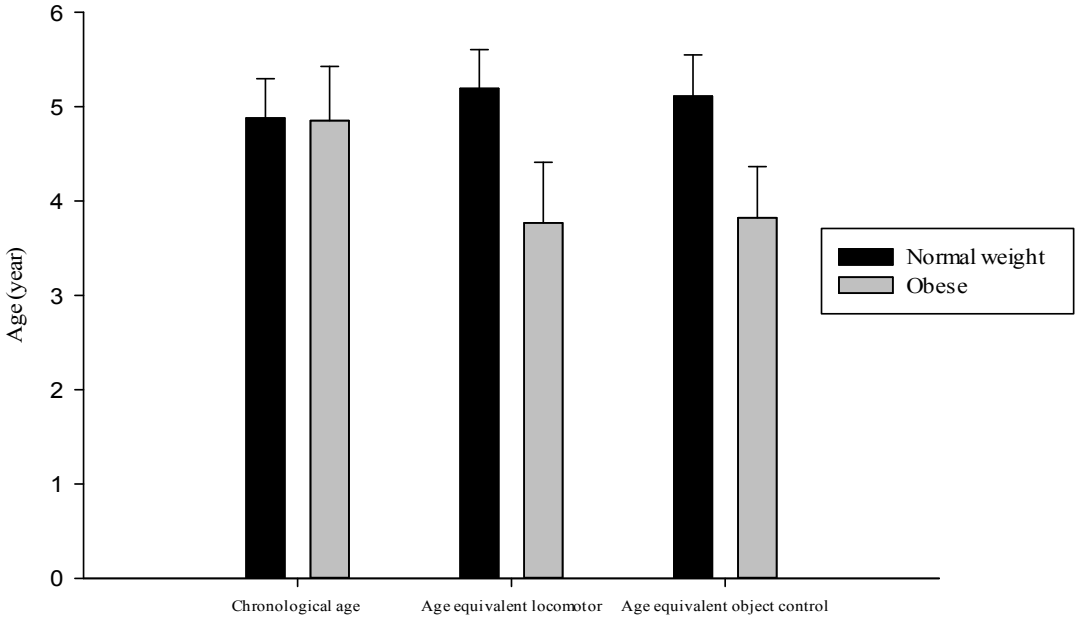

Figure 1.Chronological age and Age Equivalent of all the participants

Discussion

Early childhood is a critical period for development of gross motor skills. Preschool children are in nature curious, and love to play and explore the surrounding environment; thus, they learn motor skills very easily (Cools, Martelaer, Samaey et al. 2008). At this period, proper gross motor development is essential for children to move, stabilize their body, maintain balance and control objects while exploring their surrounding environment. Deficits in the gross motor skills reflect in low proficiency in more refined motor tasks which need the combination of these skills to obtain more highly structured skills (Catenassi, Marques, Bastos et al. 2007a). Therefore, proper gross motor development during childhood are important for the execution of many motor tasks (Doty, McEven, Parker et al. 1999).

This study investigated the gross motor skill proficiency of preschool obese children aged between four and six years. In this study, age equivalent and GMQ were used to assess the gross motor skill proficiency of participants. Findings of this study revealed that there is a significant difference in gross motor skill performance between obese and normal weight children; obese children had poorer gross motor skill compare to their normal weight peers.The results of GMQ (Table 2) which was used to describe overall gross motor skill performance indicated that normal weight children performed better in gross motor skills and achieved higher scores of GMQ(both locomotor and object control skills) compare to obese children.

Although few previous studies just considered gross motor skill performance of one gender, in this study gross motor skills of both genders were evaluated. However, differences in gross motor skills were not considered according togender, and overall performance of participants was evaluated.

In recent years, the assessment of children's gross motor skill performance has significantly increased, particularly the relationship between childhood obesity and gross motor development. Evidence that obese children have poorer gross motor skill performance compare to their normal weight peers were reported in few studies (Castetbon, Andreyeva. 2012;D'Hondt, Deforche, De Bourdeaudhuij et al. 2009; Mond, Stich, Hay et al. 2007).

Their findings indicated that there is a negative association between excessive weight and

gross motor development, which was in line with our finding and confirmed them. A recent study assessed motor skills among obese young children, and reported that motor skills are adversely associated with childhood obesity only for skills most directly related to body weight, such as jumping and hopping(Castetbon ,Andreyeva. 2012).In addition, our findings illustrated that both locomotor and object control skills of obese children were impaired(figure 1). In contrast to our findings, Catenassi and colleagues in 2007 reported that gross motor skill performance of children aged between four and six years were not related to BMI.

Over the last decade, sedentary behaviors have increased and the level of physical activity has decreased specially among obese children. Obese and overweight children present lack of physical activity and this is linked to insufficient motor experience and development of gross motor skills(Cliff, Okely, Morgan et al. 2011). Graf and colleagues (2004) reported that children who are more inactive have poorer gross motor development and endurance performance compare with more physically active children. This poor performance of gross motor skill in obese children could be the result of insufficient level of physical activity and sedentary lifestyle.

Level of physical activity might be the main reason underlying poorer gross motor skills performance by obese children. Interestingly, children with better-developed motor skills are more physically active than children with less-developed motor skills (H. Williams, Pfeiffer, O'Neill et al. 2008). Thus, future studies need to attempt to find the relationship between physical activity and development of gross motor skills among preschool obese children. Also,researchers should attempt to find new and appropriate exercise programs for obese children to improve their gross motor skills and prevent motor development delays.

Conclusion

Gross motor skills are the foundations of sports and physical activities. In fact, the focus on gross motor development has implications for the development of highly skilled sport people. Childhood obesity is one of the factors that negatively influence the development and performance of gross motor skills, thus it should be considered as a serious problem.

It is essential to identify strengths and weakness in gross motor performance as early as possible. The earlier the movement deficit is identified, and the longer an appropriate motor program is carried out, the better the result may be. Findings of this study clearly show that gross motor development of preschool children is related to obesity.Thus, obese children need plenty of opportunities to practice and refine their gross motor skills. Improving motor skills during childhood is a schedule to influence young people's present and future physical activity.

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MORPHOLOGY THE VERTEBRAL COLUMN FOR CHILDREN AGED 9-12

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Abstract
Aim. This research aims to set up standardized norms to some anthropometric characteristics (height-weight) and postural descriptions of vertebral column (V.C) for children aged 9-12 years.
Method. The study was conducted on a sample number (n=900).
Results. The researcher could reach to setting up norms for some anthropometric characteristics (height - weight) and postural descriptions of vertebral column for children aged 9-12 years.
Conclusion. Our study conducts to other studies and researchers for detection, treating and rehabilitation of postural deviations.
Key words: Posture - Percentile norms – Children.

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Introduction

Physical exercise is an important morpho-genetical factor, especially for the components of the locomotor apparatus. The bones and the periosteum, the joints and the muscles, the tendons and the fasciae have a functional structure so obvious that come to signify a graphic representation of the mechanical forces which the static and dynamic actions have on them. The amplitude of movements depends on the stretching of articular areas, the length and the thickness of articular capsule and ligaments. Within the structure of the fibrous periarticular apparatus, the connective fibres are oriented in accordance with the mechanical factors of direct or indirect drive, exercised on the joint. During the form disorders and also during the functional disorders of joints, performing analytical exercises with the joint, actively or against some resistence, can recover motility but also the stability of the deficient joint. Any physical activity, either in the shape of static effort or movements with different degree of amplitude and intensity, represents a specific performance for muscles"(Fozza, 2003). According to Cordun 1999, „the deficiencies of the vertebral column in sagital direction are represented by kyphoses, lordoses and combinations of these two, kypho-lordoses. Kyphoses are exaggerated curves of the vertebral column in sagital direction with posterior oriented convexity. Its name comes from the Latin kyphos which means anterior bent, humpbacked. From the point of view of their gravity, the kyphoses are: functional and pathological (named also real, structural or deformation)" (Cordun, 1999). Stagnara and Charriere quoted by Cordun 1999, „classified kyphoses on the vertebral region where they are located as typical and a-typical." „In corrective gymnastics, physical exercises follow not only performing, improving and developing the normal motor functions but also re-educating and recovering the weakened or disordered ones. During the disorders nd the deficiencies of the locomotor apparatus, physical exercise, measured and graded in accordance with the functional possibilities of the deficient, re-educates and improves the basic motric qualities, especially strength, speed, resistence, flexibility and skill. These functional improvements are due to the intervention of some neuro-muscular factors which ease the transmission of the nervous impulse and the complete use of energetic substances. Physical effort, even with low intensity, creates the need for a high share of nutritive substances, quickening the respiratory and cardio-vascular functions, the absorption in the intestin, the nourishment and the excretion. In medical gymnastics, physical exercises are selected and grouped but only those which influence an important function." (Fozza, 2003) .Gabr, Halil, Arslan, Gevat, Sabau, 2010, show the next fundaments theoretical about this morphology the vertebral column for children aged 9-12**:"**the anthropometric term means measurement, building and body composition, and it is a form of measurements in physical education which includes height, weight, circumferences, widths, diameters and different lengths of body parts, and also to identify forms of objects so that we can judge on body composition and its parts. Anthropometric measurements, body composition, motor abilities and biological factors are important indicators for prediction of health state and development of sports level, added to other factors that help to predict and evaluate great numbers of samples like standardized motor tests as an effective means for evaluation in sports domain. (Agwu et al., 2004), (Meszaros et al. 2000), (Tutkuvience et al., 2005). Ideal posture is considered as a reflection to integrated state of physical, psychological, mental and social aspects for individual, and also as an indicator to functional state of the body. Childhood is the most important stage for growth, where healthy habits accompany the child and affect on behavior through all his life, also posture of children slightly are varied than noticeable perfect formation of adults. Experts attributed these differences to child who face series of growth changes from birth to maturity, in addition to his different body parts that grow in varied rates, and with the growth of bones, the body composition proportions are changed as well (Dauer & Pangrazi, 1990), (Nichols 1994).Vertebral Column (V.C) in sagital direction (anterior-posterior) consists of four vertebral curves, cervical curve and lumbar one to anterior "lordosis", and dorsal curve and sacral one to posterior "kyphosis" (Tittel 2003), (Sean et al., 2005). V.C unit allows for motion in three levels like rotation, since the motion between two vertebra allows limited range of motion, and therefor, the motion of V.C always include many sub- motions for vertebrae, where range of motion of two vertebra allows to keep the varied anatomical structure in V.C regions (cervical-thoracic-lumbar). Also, V.C plays main role in overcoming the resistance that faces individual and particularly gravity resistance during his life movements and sports activity (Susan 1999).V.C is considered the main criterion for judging the individual's posture being upright or deviated because of its impact on vital organs of the body and to its anatomical structure. Also, V.C is the most important part and basic support base for skeleton, where all parts of skeleton and back muscles, responsible for upright posture, are attached to it, in addition to its importance to provide protection to spinal cord, nerves and connected blood muscles (James, A. & Portfield 1998), (Punakallion, 2005).Collective examination is the best way to detect the deviations of V.C for primary school children and it should be executed early to avoid postural problems. Therefore, it is important to detect the V.C of children annually by observing its length, flexibility, angles and strength of working muscles around it for diagnosis (Pashman, 2000), (Randunna, et al., 1990), (Rudolphf 2001). Because of importance of posture for people, many researchers, physicians and

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therapists focused their attention and interest on detecting posture hoping to achieve highest levels of sports. Modern studies in this domain not only focused on deformations and posture deviations, but also focused on perfect posture and how to protect it (Helene 2000), (Lindas 2001). Hence, experts of evaluation used norms as means of measurements to interpret values of raw data (Jensen & Hirst 1980)". Through surveying references and previous studies and researchers of posture deviations domain, the researcher didn't find any studies concerned with this subject, so she was motivated to handle this research to set up norms of postural description of V.C for children aged 9-12. Fozza 2003 considers that "in the physiology of physical exercises, the complex mechanisms which harmoniously guide the apparati and systems of the body are largely explained. One can say that physical exercise, methodically and gradually repeated, following well-established rules and principles, in accordance with age, sex and mostly with previous training of the person, can improve the important functions of the body. Physical exercise has, at any age but especially during the growing-up period, a very strong educational role. The nervous system is trainable especially in the neuro-motor area. Repeated and corrected movement can be improved not only by a better adjustment of muscles work, but also by a better psycho-neuro-motor control. The attitude of the body, the movements and gestures of the body and all the motric expressions represent, in fact, some continuous adjustment."**The Research Objective:** This research aims to set up norms for postural description of V.C for children aged 9-12.

Research Questions: What are postural descriptions norms of V.C for children aged 9-12.

Research Procedures:

Methodology: Descriptive survey method.

Research Subjects (Participants). It included primary stage pupils (n= 900) in Port Said Governorate of School year 2009/2010. Sample was chosen form (1- 6 grades) by stratified random method of (5.04%) of total society number (35 710) for male pupils, without pilot study sample. The researcher excluded postural deviations pupils of fractures, polio and rickets. Table (1) shows classification of research sample.

Table no.1. Research Sample Classification

Age	(9 – 10) years	(10-11) years	(11-12) years	GDP
Numbe	300	300	300	1800

Research Variables: Survey study was conducted to some references and previous studies for tests, measurements and posture domains to determine measurements of research which were:

1 –Height and weight.

2- Perpendicular and normal height of V.C, length of cervical, thoracic, lumbar regions, their angles and lengths of curvatures' columns.

Data Collection and Measurements: According to experts, researchers and scientists of measurement and evaluation in physical education (Johnson & Nelson, 1979), (Jensen & Hirst 1980), (Verducci, 1980), (Pashman, 2000), the following measurements were used:

- Anthropomter: to measure the total height of body (closed to 0.5cm.).

-Medical Scale: to measure body weight (closed to 0.5kg.).

-Bank raft and screen posture: to make sure that children free from postural deviations.

-Confrometer and lead tape: to measure anterior and posterior curvatures of V.C and its angles

-Wheel Measurement: to measure normal height of the V.C from first vertebrae to last one.

-Ruler (mm.): to measure the vertical height of V.C and, drawing a vertical line from the first paragraph cervical region to the last paragraph in the lumbar area

Curvatures' columns: by measuring length of horizontal distances (H.D) between V.C vertical length and deepest points of cervical, thoracic, and lumbar regions, expressed in H.D curvatures in tables.

Circular Protractor (360º): to measure angles of cervical, thoracic, and lumbar regions through:

-Drawing the first line, which connects between the first vertebrae of cervical region to deepest medial point of same region.

-Drawing second line from medial point of cervical region to point of upper posterior lateral curvature of thoracic region.

-Drawing the third line from previous point to upper anterior medial curvature point of lumbar region.

- Drawing the fourth line from previous point to spinal process of last vertebrae of lumbar region.

Angles were calculated as following:

- cervical angle: is the angle between first and second line.
- Thoracic angle: is the angle between second and third line.
- Lumbar angle: is the angle between third and fourth line.

Pilot Study: It was conducted on (50) of pupils, out of main sample, form1/10/2009 to 15/10/2009 , where equipments and apparatus were prepared and standardized to be valid for using.

Main Study: Measurements were applied on sample research from 18/10/2009 to 27/12/2009.

- Statistical treatments: The statistical analysis

included: arithmetic mean, standard deviation, skeweness and six sigma score (Lee, & Brown, 2006).

Results

Table (2)
Mean, standard deviation, minimum and maximum, range,
Torsion of children n 9-10 years **n = 300**

No	Variables		Unit of measure	Mean	Deviation	Ceiling	Minimum	Range	Sprains
1	Height		Cm.	143.98	7.06	157.0	124.0	33.0	0.97
2	Weight		Kg.	42.80	6.34	59.0	29.0	31.0	0.46
3	Vertical Height		Cm.	40.97	2.27	46.00	37.0	9.00	0.04
4	Normal Height		Cm.	42.71	2.36	48.0	38.0	9.50	0.12
5	Length of region	C	Cm.	9.20	1.00	11.0	9.0	2.0	1.04
6		T	Cm.	22:74	0.92	25.0	20.0	5.0	0.08
7		L	Cm.	10.61	1.00	12.50	9.00	3.50	0.24
8	H.D curvature	C	Cm.	2.32	0.31	3.10	1.90	1.20	0.55
9		T	Cm.	3.17	0.51	4.00	2.00	2.00	0.28
10		L	Cm.	2.31	0.68	3.90	2.60	1.30	0.34
11	Angles of regions	C	Deg.	156.10	3.32	159.0	155.0	4.0	1.06
12		T	Deg.	155.81	2.48	158.0	155.0	3.0	1.7
13		L	Deg.	158.55	1.50	160.0	156.0	4.0	0.45

Table (3)
Mean, standard deviation, minimum and maximum, range,
Torsion of children 10-11 years **n = 300**

No	Variables		Unit of measure	Mean	Deviation	Ceiling	Minimum	Range	Sprains
1	Height		Cm.	144.22	6.14	156.0	128.0	28.0	0.76
2	Weight		Kg.	41.9	6.16	56.0	28.0	28.0	0.62
3	Vertical Height		Cm.	41.41	7.07	43.00	37.0	6.00	6.79
4	Normal Height		Cm.	42.6	8.82	46.0	39.0	7.0	0.15
5	Length of region	C	Cm.	9.37	0.67	10.50	8.0	2.50	0.13
6		T	Cm.	23:23	0.79	25.0	21.0	4.0	0.79
7		L	Cm.	11.29	12.20	14.00	9.00	5.0	2.69
8	H.D curvature	C	Cm.	2.33	0.40	3.30	1.70	1.60	0.47
9		T	Cm.	3.11	0.61	4.50	2.00	2.50	0.27
10		L	Cm.	2.52	0.60	3.70	1.60	2.10	0.31
11	Angles of regions	C	Deg.	156.22	1.7	158.0	154.0	4.0	1.44
12		T	Deg.	157.10	1.9	160.0	154.0	6.0	1.94
13		L	Deg.	158.85	2.8	162.0	156.0	6.0	1.38

Table (4)
Mean, standard deviation, minimum and maximum, range,
Torsion of children 11-12 years **n = 300**

No	Variables		Unit of measure	Mean	Deviation	Ceiling	Minimum	Range	Sprains
1	Height		Cm.	149.95	7.13	163.0	135.0	28.0	0.43
2	Weight		Kg.	43.73	5.38	58.0	35.0	23.0	0.33
3	Vertical Height		Cm.	43.85	3.95	49.0	36.0	13.00	2.94
4	Normal Height		Cm.	45.46	2.69	52.0	40.0	12.0	0.065
5	Length of region	C	Cm.	9.92	1.17	13.0	8.0	5.0	0.43
6		T	Cm.	23:70	1.35	27.0	21.0	6.0	0.32
7		L	Cm.	11.64	1.61	15.00	12.00	2.50	3.14
8	H.D curvature	C	Cm.	2.52	0.50	3.50	2.30	1.20	1.24
9		T	Cm.	3.50	0.61	4.70	2.30	2.40	0.28
10		L	Cm.	2.47	0.50	3.80	1.90	1.90	0.12
11	Angles of regions	C	Deg.	158.02	2.73	160.0	154.0	6.0	1.50
12		T	Deg.	157.17	2.01	159.0	154.0	5.0	1.41
13		L	Deg.	158.80	2.69	160.0	156.0	5.0	1.01

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Table (5)

Degrees centipede standard corresponding to the raw measurements of length, weight, The backbone of the children from 9-10 years. n = 300

Raw Data	Height	Weight	Vertical Height	Normal length	Length of region			H.D curvature			Angles of regions			Estimate
					C	T	L	C	T	L	C	T	L	
Percent. Norms	Cm.	Kg.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Deg.	Deg.	Deg.	
100	165.17	53.81	47.78	49.79	12.18	25.51	13.61	3.24	4.72	4.62	160.70	159.47	160.92	Excellent
90	160.93	51.00	46.42	46.37	11.60	24.96	13.01	3.06	4.41	4.32	159.72	158.98	160.45	Very Goo
80	156.69	49.21	45.00	44.96	11.00	24.40	12.41	2.87	4.10	4.01	159.22	157.97	159.85	Good
70	152.46	47.41	43.70	43.94	10.40	23.85	11.81	2.69	3.79	3.51	158.62	157.50	159.47	Good
60	148.22	45.60	42.33	43.13	9.80	23.29	11.21	2.51	3.48	2.83	157.65	156.82	158.95	Average
50	143.98	42.80	40.97	42.71	9.20	22.74	10.61	2.32	3.17	2.31	156.10	155.81	158.55	Average
40	139.74	41.00	39.61	42.42	8.60	20.19	10.00	2.14	2.86	1.97	155.14	154.69	156.65	Accepted
30	135.51	37.20	38.25	40.00	8.00	21.63	9.41	1.95	2.55	1.62	154.11	153.89	155.75	Weak
20	131.27	33.40	36.88	38.59	7.40	21.08	8.81	1.77	2.24	1.20	153.42	152.72	154.85	Weak
10	127.03	29.59	35.52	37.17	6.82	20.52	8.21	1.58	1.93	0.89	152.00	151.63	153.95	Very weak
Zero	122.79	25.79	34.16	35.76	6.22	19.97	7.61	1.40	1.63	0.65	151.06	151.00	152.20	Very weak

Table (6)

Degrees centipede standard corresponding to the raw measurements of length, weight, The backbone of the children from 10-11 years. n = 300

Raw Data	Height	Weight	Vertical Height	Normal length	Length of region			H.D curvature			Angles of regions			Estimate
					C	T	L	C	T	L	C	T	L	
Percent. Norms	Cm.	Kg.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Deg.	Deg.	Deg.	
100	162.64	60.33	46.61	48.00	11.89	25.11	14.39	3.53	4.94	4.33	160.35	159.92	161.69	Excellent
90	160.96	58.17	45.37	46.91	10.79	24.64	13.07	3.29	4.58	4.01	158.90	159.13	160.98	Very Goo
80	158.96	56.63	44.13	45.82	10.38	24.15	12.79	3.05	4.21	4.61	158.27	158.61	160.38	Good
70	155.27	52.94	42.89	44.73	9.89	23.85	12.34	2.81	3.84	3.24	157.64	158.22	159.93	Good
60	153.22	47.35	41.65	43.64	9.58	23.45	11.57	2.57	3.48	2.88	157.12	157.54	158.15	Average
50	149.35	43.90	41.41	42.60	9.37	22.23	11.29	2.33	3.11	2.52	156.22	157.10	158.85	Average
40	145.32	38.16	39.67	41.46	8.77	22.25	10.85	2.09	2.74	2.16	155.38	156.41	157.53	Accepted
30	140.85	34.46	38.93	40.37	8.36	21.88	10.23	1.85	2.38	1.80	154.37	155.47	156.37	Weak
20	134.17	30.76	36.29	39.28	7.96	21.30	9.49	1.61	2.01	1.43	153.93	154.17	154.21	Weak
10	129.48	27.07	37.45	38.19	7.55	20.82	8.36	1.37	1.65	1.07	153.21	152.21	152.67	Very weak
Zero	125.80	23.38	36.21	37.71	7.15	20.35	7.37	1.13	1.38	0.71	152.27	151.32	151.55	Very weak

Table (7)

Degrees centipede standard corresponding to the raw measurements of length, weight, The backbone of the children from 11-12 years. n = 300

Raw Data	Height	Weight	Vertical Height	Normal length	Length of region			H.D curvature			Angles of regions			Estimate
					C	T	L	C	T	L	C	T	L	
Percent. Norms	Cm.	Kg.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Deg.	Deg.	Deg.	
100	171.33	59.87	53.70	55.70	13.42	27.74	15.02	4.00	5.32	4.36	161.22	159.90	161.65	Excellent
90	167.06	56.64	51.33	53.33	12.72	26.93	14.54	3.71	4.96	4.06	160.58	159.23	160.74	Very Goo
80	162.78	53.41	49.96	51.30	12.02	26.12	13.98	3.41	4.59	3.77	160.04	158.94	160.23	Good
70	158.50	50.19	47.59	49.30	11.32	25.32	13.09	3.12	4.23	3.47	159.74	158.50	159.81	Good
60	154.23	46.96	45.22	47.88	10.62	24.50	12.61	2.82	3.86	3.17	158.84	158.00	158.29	Average
50	149.95	43.73	43.85	45.46	9.92	23.70	11.64	2.52	3.50	2.47	158.02	157.17	158.80	Average
40	145.67	40.50	41.48	43.85	9.22	22.89	10.67	2.22	3.14	2.17	157.41	156.48	158.27	Accepted
30	141.40	37.27	39.11	42.23	8.52	22.09	9.71	1.93	2.77	1.98	156.26	155.62	156.82	Weak
20	137.12	34.05	37.74	40.62	7.82	21.28	8.74	1.63	2.41	1.73	155.33	154.37	155.97	Weak
10	132.85	30.08	35.37	38.00	7.12	20.47	7.78	1.33	2.04	1.53	154.50	153.21	154.32	Very weak
Zero	128.57	27.59	32.00	36.11	6.43	19.66	6.81	1.03	1.50	1.23	152.30	151.30	153.40	Very weak

Discuss: the results of tables (2-4) show that there are gradual increasing during the aged stages of research measurements, which are consistent with results of (Kromeyer et al., 2001) concerning with rates

of anthropometric measurements, where (Butte, et al., 2007) indicated that it is necessary to follow up the international norms of growth for children and adolescence stages and set new norms and standard for different aged stages. Also tables (5-7) indicate results of percentile norms to raw data of anthropometric measurements and postural descriptions of children aged 9 – 12 , where these norms confirm that there are relationship between anthropometric characteristics and body composition and selection of physical talent children (Meszaros, et al., 2000). Anthropometric measurements are considered indicators for public health and as a reflection of growth and development state (Tutkuviene, 2005).

Conclusions

The researcher could reach to setting up norms for some anthropometric characteristics. (height - weight) and postural descriptions of vertebral column for children aged 9-12 years.

Recommendations

-Using these norms as a guide for researchers in posture domain and to detect postural deviations so as to treat them and as indicator to select juniors for sports activities.

The results of these norms confirm the increase of growth for both height and weight, in addition to morphology growth of both vertical and normal height of V.C with variance of H.D curvature and angles of cervical, thoracic and lumbar regions of V.C for children aged 9-12 years. So, these norms should be taken into account when classification of children into homogeneous groups or when guiding them to sports activities owing to their physical and morphological abilities. Also, these norms should be used as criteria to detect postural deviations of V.C for children aged 9 – 12 years comparing with results of this research.

-Necessity of conducting measurements of research for other aged stages to be used for promotion of children health level.

-Conducting regular medical collective examination for children annually to detect and identify changes that might occur to avoid future problems.

-Conducting more similar studies that handle postural deviations for different aged stages and other variables

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THE ROLE OF MOVEMENT IN INCREASING OF BONE DENSITY

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Abstract
*Aim.*The movement reported at microscopic level, but also at the human being, has an important rol in maintaining optimal quality of living matter.
It is, practically, the stimulus necessary for bone formation with effect on increasing bone density and hence, decrease the risk of fractures, especially in elderly people. Presence in human life of physical activity provides not only physical health, but also mental health, resulting in improved quality of life.
Purpose. The aim of this paper is to demonstrate the mechanisms involved in making motion, and identifying the role of movement in bone formation.
Objectives. Objectives are represented essentially by highlighting key anatomical and functional structures underlying motion and the mechanisms involved in bone formation.
Methods. The research method used was the study of theoretical documentation represented by specialized bibliography.
Conclusions. Anatomical and functional peculiarities of the main structures involved in movement - nervous system, muscular system, osteoarticular system - are essential for understanding the mechanisms underlying achievement of movement and the consequences of its lack, not only on these structures, but also on whole body. Muscle contraction by traction exercised on the bone, plays a role in triggering of the process of bone formation while the kinetic programs tailored clinical features of patients with osteoporosis or at risk for osteoporosis, may favorably influence their evolution.
Key words: osteoporosis, bone mass, piezoelectric effect, mechanical stress.

Introduction

It is a well-known fact that, since the beginning of time, man has earned his living through physical work. As time passes, due to the development of technology, physical labour was gradually replaced by various machines that took over some part of man's physical effort. In parallel, the development of science allowed the step by step outlining of the importance of movement, both for the physical and for the mental health of the human body. At the same time, adverse effects due to inactivity or prolonged immobilization have been shown on human health and development in general.

According to the "Declaration of consensus", developed at Turin in 1992, during the II "International Symposium on physical education, fitness and health", physical activity is defined as "*any movement performed using skeletal muscle which results in a substantial increase in energy consumption during rest*" (Roman, 2008:7).

The structures involved in achieving motion are complex, being mainly represented by bones, muscles and nerves. The mechanisms for adjusting to effort are based on the involvement of the cardiovascular system, respiratory system, nervous system, and also on a series of changes that occur at the level of the tissue metabolism. In order to determine the physiological changes for adapting to effort, the stimulus must have the ability to produce a stress on the structures of the body, a stress that will compulsorily result in a state of vitality, energy.

„*An adequate physical capacity, by practicing*

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regular physical activity, translates into increased physical performance, self-confidence and a physical and psychological independence, also contributing to the perceived quality of life." (Roman et al., 2008:32).

On the other hand, prolonged immobilization causes changes at various levels of the body.

For example, at the *cardiovascular* level we see a number of changes emerging due to a disruption in the adaptive mechanisms that the body has created as a result of adopting vertical position. Thus, under the conditions of bed immobilization, the loss or lack of "gravitational stress" causes a disruption or suppression of these adaptive mechanisms, resulting in the consequences:

- the information from pressoreceptors is inadequate, causing the excitation of renin-angiotensin-aldosterone axis with increased excretion of water and electrolytes, resulting in hypovolemia;
- the venous stasis together with hypovolemia and the cardiac inadequacy to effort, determine a decreased systolic flow. In the case of physical activity, the increase of cardiac output will be caused by the rise in heart rate with increased oxygen consumption in the myocardium;
- the decreased venous return associated with haemoconcentration (due to increased excretion of water and electrolytes) determines favourable conditions for the occurrence of venous thrombosis;
- hypovolemia and the alteration of the pressoreceptor mechanisms result in orthostatic hypotension at the time of vertical lifting, with decreased cerebral perfusion. In the elderly, due to cerebral arteriosclerosis, the installation of hypotension can cause transient ischemic attacks.

Among the changes in muscle metabolism we meet: hypo / muscle atrophy, decreased muscle strength and endurance, decreased content of macroergic and myoglobin molecules, a negative balance of sodium (Na) and potassium (K) ions, decreased oxygen transport capacity (O2) (due to anaemia, decreased cardiac output, and so on) and of its quantity, and due to impairment of respiratory mechanics, muscular hypotonia occurs. Thus, the muscle, when resuming work, will have a low buffering capacity of acids produced during exercise and an affected local oxidative capacity.

At the level of the locomotor system, contractions occur and afterwards retractures, with increased tensile resistance. The strong influence exerted by movement on the biological processes of the bone has also been prooved. Thus, movement, shaft or lateral pressures are bone formation stimulating factors , following bone collagen fibres slipping from each other, leading to the appearance of a difference in electrical potential, a process that is based on the so-called "piezoelectric effect" (Sbenghe, 2005:34), the cause thus being a mechanical one, while the effect is electric.

Other changes in the locomotor system are represented by decreased elasticity of soft tissues due to the alteration of collagen secretion (which seems to decrease by almost half if the segment is immobilized), joint stiffness, synovial inflammation, erosions, cysts, fibrous organization which leads therefore to the installing of stiffness, a number of adhesions at capsuloligamentar , musculo-muscular and musculo-skeletal level; venous stasis accompanied by oedema and fibrous organization; muscle heterotopic ossification (met in immobilizations caused by central nervous system disorders) or algoneurodistrophy of the paretic limbs, especially on the upper limb.

In its turn, the respiratory system suffers changes which include: decreased functional capacity of the lung by 5-7% each week. On the other hand, the supine position causes the limiting of chest expansion in the posterior and medial areas, ventilation being accomplished mainly on account of ventral and external areas. Thus transient atelectatic areas appear, but they may influence lung function through their stretching. To these we also add a shortage of bronchial drainage. Lung circulation is affected, leading to pulmonary stasis manifested especially in the posterior and basal areas. All these favour, in their turn, lung infections and lung micro embolisms.

In these persons we often meet the installation of depression, and also a loss of sensory-motor engrams following prolonged immobilization. Studies show that due to lack of exercise, especially in athletes when they stop training, the body will produce a series of relatively fast changes, which are, to a certain point, reversible "*with the decrease to 40% of mitochondrial cytochrome oxidase in approximately 2 weeks and maintenance of low levels after 2-6 weeks, and at the same time it cause a decrease in VO2 by maximum 5% after in about 6 weeks.* "(Tache, Staicu, 2010).

Through information gathered from specialty studies, we appreciate the overwhelming importance of movement on bone formation and, not least, on the quality of human life.

We believe that the approach to movement in terms of anatomical and functional structures involved, and also of its positive effects on the body, is a matter that needs to be investigated in detail. The purpose of this paper is to demonstrate the mechanisms involved in achieving movement, and to identify the role of movement in the formation of bone.

The objectives can be essentially grouped as follows:

- General objectives - represented by highlighting main anatomical and functional structures underlying movement;
- Theoretical objectives -represented by the study and interpretation of specialized literature to support the scientific approach of the topic, but also by the emphasizing of the theoretical aspects supporting the practical application;

- Practical-applicative objectives - represented by the highlighting of the role of movement in the formation of bone.

Getting to know the anatomical and functional peculiarities of the main structures involved in movement - nervous system, muscular system and osteoarticular system - is essential for understanding the mechanisms underlying the achievement of movement, but also of the consequences of its lack not only on these structures, but also on the entire body.

As a hypothesis, we propose the following:

1. If we highlight the anatomical and functional peculiarities of structures involved in movement, we can more accurately understand how it is done.
2. The understanding of the way in which movement is made will lead to understanding the effects of movement on the body and primarily on bone.
3. By knowing the effect of movement on bone, we will have a more accurate perception about the involvement of movement in the formation of bone.

Movement is undoubtedly the mode of existence of living matter, essentially one of the fundamental manifestations of life.

Not only a sedentary lifestyle, but also the transition to bipedal posture was the one that led, as noted above, to the occurrence of changes in the body. In an article published in the October 2011 number 6 issue of the journal PLOS ONE, Ohio, USA by Meghan M. Cotter and colleagues, regarding human progress and osteoporosis, it is shown that a series of adaptations following the bipedal posture have occurred at the level of human vertebral bodies, which resulted in a lower strength of the vertebral body compared to those of monkeys: the distribution and orientation of bone bays have similarities, despite the peculiarities of human and ape locomotion; it also seems that spine load and kinematics are similar in the 2 studied groups. Instead, human vertebrae are larger in size, but the amount of trabecular bone is reduced, the human vertebra is more porous and the cortical thinner.

The fact is that the incidence of vertebral body fractures due to osteoporosis is quite high in humans, while in monkeys they are missing even though they have a high degree of osteopenia. It seems that the thinning of the vertebral body cortical associated with the prolonged flexed position adopted by man very often during daily life, plays an important role in vertebral body fractures.

About the effects of the prolonged immobilization on bone, specialists in the field have established that they exist and that, often, due to the arising complications, mainly represented by fractures, they have a bad influence on individual lives. Thus, immobilization may lead to decreased bone mass and osteoporosis. Osteoporosis is the most common bone disease characterized by decreased bone mass, changes in bone architecture, elements that lead to a decrease in its resistance and an increased risk of fracture. The increased incidence of osteoporosis as a disease, especially the appearance of its complications mainly represented by fractures, caused a continuous increase in expenditures for the treatment of patients suffering from this condition.

A study conducted by the U.S. National Institutes of Health, published in October 2011 in the journal Archives of Internal Medicine, showed that women who suffer hip fractures between the ages of 65-69 years have a five times greater risk of dying next year because of postoperative complications as compared to women from the same age group who did not suffer such fractures. "*For patients who underwent hip fracture and died in the first year after the accident, more than half died within three months after the fracture and almost three quarters in the first six months*", said the researchers.

In addition to bone formation, exercise plays a role in maintaining a normal body weight, which in turn influences the quantity of bone mass. Until recently it was thought that a heavier weight than normal would reduce the risk of osteoporosis, due to the high mechanical load exerted on the bone. A study published in the Journal of the Clinical Endocrinology and Metabolism by Zhao and co. from the University of Missouri-Kansas in 2007, shows that an increase in weight and therefore increased mechanical loading of the bone is favourable only until a normalization of individual weight (if it is reduced). As we move away from normal values to some increasingly larger ones, it was found,however, that is caused a decrease in bone mass.

Essay content

Several structures are involved in achieving movement, mainly represented by the nervous system, muscular system and the skeletal one.

At the level of the nervous system, the achievement of a voluntary movement requires the intervention of three types of systems :

1. The sensory system - represented by cortical somatosensory areas of the parietal lobe, which integrate proprioceptive, exteroceptive (mainly tactile), vestibular, visual, auditory afferents;
2. The motor system - represented by motor cortical areas that give the motor command, thus initiating and controlling the response. They are represented by: the main motor area (area 4 Brodmann), the supplementary motor area, the premotor area, frontal optical area;
3. The regulator system, represented by the bone marrow through the loop range and extrapyramidal structures involved in providing the tonic postural and balance fund, and also the automatic movements necessary to conduct the voluntary act.

Skeletal muscles are the actual organ of the locomotor system, as they are causing the human body movements due to their property to contract. In addition to the common structural elements found in a cell, the muscle fibre also contains a few particular types of proteins represented by: contractile proteins

(actin and myosin), regulatory proteins (troponin and tropomyosin) and structural proteins (for example conectine).

The electric impulse that reached the sarcolemma level causes the triggering of a potential action that results in calcium penetrating the cell, resulting in its growth at the sarcoplasma level, a quantity that is actually insufficient for triggering contraction, but sufficient to promote the opening of calcium channels at the level of sarcoplasmic reticulum, followed by a significant increase of intracellular calcium (from 10 at the power -7 to 10 at -5 mol / L) in the amount needed for triggering contraction.

The mineral element Calcium is bound to Troponin C causing the movement of tropomyosin from its attachment situs at the actin level, exposing this situs. The S1 meromyosin fragment will be fixed at this level, resulting in the change of the angle between the 2 myosin parts, namely its head and neck. Thus, actin is drawn towards the middle of the sarcomere, sliding between myosin filaments. The so-called coupling of actin with myosin is achieved, followed by the release of diphosphate adenosine (ADP) and inorganic phosphate on the myosin head. The breaking of the connection between actin and myosin requires the presence of ATP which is attached to the myosin head and will detach from the actin.

In order to achieve relaxation, calcium must return to its rest concentration, which is done through several mechanisms:
- Re-uptake Ca at the level of the sarcoplasmic reticulum (RS) through the action of the Ca pump at its level;
- Removing Ca from the cell by the Na-Ca sarcolemma antiport mechanism and through the action of the sarcolemma pump.

As a result of muscle contraction through means of tendons, the movement of bone segments is achieved. Skeletal functions are not limited only to those of mechanical support or support of the entire body, but are more complex, as it protects the internal organs, also being at the same time a hematopoetic organ due to its marrow, as well as a reservoir of active calcium and phosphorus ions.

Bone is composed of water, of a mineral phase and of an organic phase. The latter is located in the bone structure in proportion of about 20-25%, being represented in a large amount (over 80%) of type I collagen and non colagenic proteins (osteonectin, osteoprotein, osteopectin, sialoprotein, etc.) and other structures such as: growth factors, lytic enzymes etc. In its turn, collagen is a polypeptide (resulting from the combination of several amino acids of which the most important are lysine and hydroxylated proline) synthesized in osteoblasts which unite 3 peptide chains (2 alpha 1 type and 1 alpha 2 type) with helicoidal structure (this connection is achieved by means of extension peptides that are found on the periphery of polypeptide chains and which, when the collagen molecule is removed from the osteoblast, are detached from it). In addition to osteoblasts, the collagen molecules are united with each other both head to head and also sideways by means of bridges, resulting in collagen fibres. In a very large proportion, of 70-75%, the bone is made up of a mineral phase represented by the hydroxyapatite (crystalscalcium phosphate) which will be disposed between the collagen fibres.

At the bone level we find several types of cells arranged as follows:
- on the surface of the bone there are osteoblasts, cells derived from stem cells in the bone marrow that are metabolically active (with a highly developed endoplasmic reticulum, the place where proteins are synthesized) the collagen synthesis being achieved at their level . They have many receptors for estrogen, parathyroid hormones, the D hormone (Boloşiu, 2008:15) and during development they either suffer the apoptosis process or they become bone lining cells (also placed on the bone surface, taking part in its protection) or turn into osteocytes.
- osteocytes are found in the bone at the level of the mineralized matrix, connected by their extensions, among themselves and with bone lining cells, therewith forming the so-called osteocyte syncytium representing the receptor organ for the mechanical forces which, by acting on the bone, determine the initiation of the remodelling process. The disposal of osteoblasts at bone surface, and also the presence of osteocyte syncytium could explain why the stimulation of the periosteum due to muscle action may trigger bone formation.
- osteoclasts are cells derived from bone marrow hematopoietic cells (more precisely from the monocyte-macrophagocytic lineage) and therefore contain a large number of lytic enzymes (the most important being acid phosphatase and cathepsin K). They are brought by blood to the bone surface, initiating the remodelling process .

These structures are arranged differently, resulting into two types of bone: the cancellous or trabecular bone, which is found in the central portion of the short bones and in the epiphysis of long bones, and the compact or cortical bone, which is found on the surface of bone.

Bone is an organ constantly remodelled through 2 processes: the resorption one, achieved through osteoclasts and the restoration one, made through the action of osteoblasts.

The mechanical stimulation of the bone (loading, muscle contraction) is an important factor in achieving and maintaining bone capital. Following a sustained exercise, there is an increase in osteoblast activity which results in a hypertrophy of the compact and cancellous bone, and also in a consolidation of the bone insertion points of tendons, ligaments and joint capsules.

Skeletal load restriction (for example in case of a prolonged rest or weightlessness as encountered during cosmic flights etc.) leads to a decrease in bone mass density.

Bone remodelling begins by removing the bone lining cells from the surface of the bone and exposure of the mineralized area through osteocytes lysis in that area (because they have a role in inhibiting bone resorption) by phagocytes, but also through the formation of neoformation vessels in those areas needed to bring resorption cells, (which are transported by blood to the bone).

Speeding traffic in areas which are active during practice exercises, due to increased demand for oxygen and nutrients, could explain the facilitated transport of osteoclasts with the initiation of the remodelling process. The bone mass quantity increases during human growth period until around the age of 25-30 years when it seems to reach the maximum value, enters the plateau and then begins to decrease after the age of 40-50 years.

Along with age, in addition to diminishing bone mass formation, a poor metabolism of vitamin D also occurs, which results in decreased absorption of calcium, decreased calcium levels and installation of secondary hyperparathyroidism which, in its turn, increases bone resorption.

The main problem that arises from the reduction of bone mass is increased susceptibility to fracture. It seems that a 25% reduction of cancellous bone bone mass leads to a resistance decrease of almost 45% (Boloşiu, 2008:24).

The bone resistance is dependent both on the density of the bone mass and on the quality of the bone (on the distribution of bays, cortical thickness, heterogeneity of mineralization etc.). Along with age, we can first notice thinning and disappearance of horizontal bays at the level of the vertebral body, for mechanical stress is lower at their level, with the persistence of the vertical ones over a longer period of time, as at their level mechanical stress is more important due to bipedal resort.

Valuable information about bone structure was obtained using a technique called bone histomorphometry, which consists in tetracycline marking and performing bone biopsies.

Studies have shown that bones behave like crystals due to collagen in their structure. Fukada and co. (1957) demonstrated piezoelectric properties of the bone, due not to hydroxyapatite crystals which are not centrosymmetric, so they do not have such properties, but to collagen fibres. This is due to collagen structure which is formed by the interweaving in triple spiral of 2 alpha 1 chains with one alpha 2 string, merging together by bridges arranged head to head and sideways, thus forming collagen fibrils. Collagen fibres in the bone structure have a very well established guideline.

The basis for the formation of bone mass is represented by the signal that is received at the level of the osteocytary syncytium due to mechanical application of bone, and that triggers the formation of bone. Electrical changes occurring at bone level are due to its anatomical and functional features that determine the onset of a piezoelectric effect. The name comes from the Greek word "piezo" which means to press. Thus, the direct piezoelectric effect consists in the property of crystals to charge with electric charge on some of their sides when subjected to tensile or compressive task in a certain direction. The inverse piezoelectric effect is also called electrostriction and is represented by the property of crystals to deform in certain directions, if there is a difference of potential on some of their sides. The size of electric charge is proportional to the applied force. Through the action of forces F on the mechanical axis, the network also deforms and the centres of gravity of particles with negative charges and of particles with positive charges no longer coincide. An electric dipolar moment arises and hence the polarization of electrical charge which, in the case of the bone, triggers the formation of bone mass.

The first information about the use of electricity for strengthening a fracture apparently dates back to 1841, being reported by Hartshorne who describes a person with tibia fracture being treated with electric shock in 1812 for 6 weeks. Currently, more and more laboratories are studying the effects of electric current (DC, electromagnetic stimulation etc.) on bone and cartilage (Bringhton, 1981).

Collagen is a protein structure, in which molecules are equally well established, being at a distance of 0, 1D, 2D, 3D, 4D from neighbouring molecules, where D = 1/4, 4 of the length of the molecule . It is a coaxial system consisting of proteins (the most important being lysine and proline in the hydroxylated form) and a matrix made of hyaluronate and proteoglycans. An electrical phenomenon occurs when proteoglycans move among collagen fibres. (Norman,http://www.normanallan.com/Sci/Crystals.html).

There are 2 independent mechanisms responsible for the electromechanical behaviour of the bone: piezoelectric and electro kinetic. The first is related to the emergence of a separation of electric load at the level of bone matrix and the second one involves potential arising from the consolidation of bone matrix during deformation.

Studies on the mechanical behaviour of bone during action potential generating mechanic stress, by using microelectrodes, showed that bone generated potential has an intensity of 1-2 magnitude orders (10-100 times higher than that measured at the macro level through determining average values of the electric fields) (Pollack, 1979).

When we move, we change the load degree at bone level, causing the appearance of differences in

potential. If this move is made in the presence of a strong magnetic field like the one generated by Earth, these effects are magnified. Thus, placing such a structure in a magnetic field as the one produced by Earth will determine the interaction with it and it could explain certain phenomena such as * magnetic pass * therapy, but also the necessity of gravity for bone formation.

Studies carried out at the University of Pennsylvania between 1970 and 1980 showed that the application of an electric current can cause both formation and resorption of bone mass, depending on the polarity of the used current. According to the theory of Arndt-Schulz (http://en.wikipedia.org), the same external stimulus, depending on its intensity, may cause excitation, inhibition or may destroy the biological structure on which it acts.

The study on the effect resulting from the application of one uniform compression and of an uneven one on the cortical bone, carried out by Iannacone and co. (1979) and published in the Journal of Biomedical Materials Research, demonstrated the production of differences in potential, caused by mechanical stress following the uneven compression, whereas, in the case of uniform compression, electric fields around osteons were equivalent and did not reveal a difference in potential. Also, the value of electrical potential was different depending on the region on which uneven compression is applied. In their turn, intra-osteon potentials obtained are uneven: a potential decrease has been observed at the level of Haversian canals, close to the compressed side, and their growth on the opposite, tensioned side of the bone.

Experiments conducted by McElhaney on a human femur that was dried by exposure to 105 degrees for 2 weeks and at whose level 600 microelectrodes were mounted, showed a different bone behaviour depending on how the compressive forces acted: areas in which bone mass was produced and areas where bone resorption occurred. Implanted platinum electrodes were used to eliminate corrosion, mounted inside the bone about 6 inches above and below the fracture. It seems that the effect of the used current is to increase the number of osteoblasts in the fractured area.

Therefore, tendon traction exerted by different types of muscle contraction performed under different conditions (starting position, duration, intensity, etc.) will cause different effects on the bone.

There are three types of muscle contractions:

- the isometric contraction, in which, as the name tells, the length of the muscle remains the same, but muscle tension increases. This contraction is achieved without moving the segment.

- the isotonic contraction, through which the tension remains approximately constant while the muscle length changes either in the sense of shortening -concentric contraction, or in the sense of elongation - eccentric contraction. This type of contraction thus causes the movement of the segment.

- the isokinetic contraction is also a dynamic contraction that is achieved by applying a slightly variable resistance so as to cause a constant motion speed and a constant force throughout the entire motion range.

Studies have shown that, out of these contractions, the greater ability to generate force is achieved by the eccentric contraction, then by the isometric one and the least by the concentric one, while if we compare the effect to energy consumption, the best performance is achieved by the isometric contraction, followed by the eccentric one.

By combining the use of patient drug therapy with appropriate kinetic programs, it is aimed to achieve a reduction in drug therapy, which would have major implications both in managing the diseases of a person with osteoporosis (limiting adverse effects, polimedication, certain contraindications, etc.), but also financially by reducing costs.

Last but not least, increasing bone mass or maintaining it through a well performed kinetic program can be a physiological way to improve an important medical problem, which occupies a leading position in bone diseases of the elderly. From the above mentioned issues, it appears that this scientific approach has a practical, a medical and an economic importance.

We intend to use the research results as a basis for drawing up kinetic programs aimed at people with osteoporosis, who present risk factors for developing this disease or risk factors for falls.

Conclusions

1. The highlighting of the main structures involved in achieving movement (nervous system, muscular system and skeletal system) and also of their anatomo -functional characteristics, allows us to understand the mechanisms underlying movement.

2. The lack of movement causes a series of changes in the body, which may even lead to death.

3. Movement, due to traction exerted on the collagen fibres in bone structure, is the stimulus needed to trigger the bone mass formation process.

4. The implementation of certain kinetic programs adapted to clinical features of patients with osteoporosis or at risk of osteoporosis, may favourably influence their evolution and, at the same time, cause a decrease in costs needed for carrying out their primary and secondary prevention.

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OPTIMIZATION OF THE RELATION BETWEEN EFFORT CAPACITY AND PSYCHO-AFFECTIVE STATE IN OLDER PEOPLE

RABOLU ELENA[1]

Abstract
The purpose of this research is to identify the relation between the psycho- affective state of older people and their effort capacity, upon implementing some complex kinesic programs.
Methods: explanation and practical demonstration methods; Conversation method; Observation method.

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Results: data analysis showed a powerful, negative and statistically significant correlation at a threshold of 0, 01 (rho = -0, 74, p < 0,001), between emotional distress and the maximal oxygen consumption in the final testing phase.
Conclusions: the more they experience a larger number of dysfunctional emotions, the more the effort capacity is higher.
Key word: Effort capacity, psycho-affective state, kinesitherapy, tendon rupture, return to the sport activity.

Introduction

Old age is not a disease, as it was thought of in the beginning of the 20th century; it consists of a number of normal processes evolving over time, a life stage, very complex from a medical and medical-social points of view.

From a psychological point of view, old age is less intense involution scenery than the biophysical one. The most significant deteriorations are registered within those functions directly related to the biophysical features of the neuroendocrine system, namely the mnesic function (it registers and fixates current information), focus and attention's stability, vivaciousness and spontaneity of imagination, flexibility in thinking, emotional stability (they cry very quickly for anything), stress resistance, and so on.

An active old person does not age intellectually, physically or socially, and has to time to think about old age (Dumitru, 1984).

Movement preserves a satisfactory condition of the cardiovascular and mioartrokinetic system's functional parameters, creates a certain psychical balance, giving a feeling of independence and usefulness (Dumitru, 1984).

Physical exercises and sport in older people have a double outcome on psychical functions: firstly by stimulating them, and second, by ensuring the intellectual activity's stability (Niculescu, Georgescu, Marinescu, 2006).

The gerontological studies regarding the influence of physical exercises and sport on man's health and longevity have proven that athletes enjoy longer life than the other individuals, and most of them are physically fit and in good psychical condition at an advanced age (Cristea, 1990).

Following the introduction of a few hours of sport or aerobic exercises per week on a longer period, net improvement in cognitive performances and distinctive increases of resources for attention in older people was seen.

Studies show that intense aerobic physical activity done over the years (prophylactically) favour those who have done it, as compared with the ones who have lead a sedentary life, by the way in which they do different activities requiring good visual- spatial qualities (Sbenghe, 1999).

Aims of study

This scientific approach was based on the idea according to which fighting against isolation and preservation of the old persons' dignity implies the promotion of physical activity, by using kinetic means as a solution to achieve the „active longevity" objective.

This study was carried out at the Social Work and Care Centre of Piteşti.

A number of 40 subjects participated in the research, aged between 64 and 72 years old; they were divided into two groups: the experimental sample (n =20), for which a kinesitherapy program was implemented, and the control sample (n =20), which carried out the regular daily program, refusing to participate in the programs carried out within the centre.

Within the kinesitherapy sessions, the old people followed 2 cardio-type programs, 3 days per week for 6 months. The basic idea was that at this age, we are less interested in the strength of a given muscle, and more interested in the individual's effort capacity in carrying out daily activities and psycho-affective comfort that this total independence gives them.

Research premises

- The ageing process is very complex or it can be seen as a number of general, universal and irreversible processes. The basic reason for human ageing is yet to be solved;
- An optimal health status during the entire life is the key element for an active old age period;
- Awareness of older persons' health status allows different courses of treatment or therapy with a view to delay the deficits processes and prolonging lifespan.
- As people grow old, pathological hazards influence the body at an increased frequency and intensity; this implies prophylaxis measures, early diagnosis and, when necessary, adequate treatment;
- Currently and in perspective, accent is laid on primary health measures, by which the elderly care is ensured at their own home, within the family; this rules that will ensure healthy ageing;
- Personalized kinetic means to be used for ending ageing-specific phenomena turned out to be beneficial on the ageing process.
- Kinesitherapy allows the preserving of fitness, by optimal use of functional (reserves) availability of the body, when adapted to the morpho-functional particularities of the older persons.

- Systematic and regular physical training in older persons does not only reduce the occurrence of diseases (high blood pressure, osteoporosis, arthrosis, non-insulin dependent diabetes mellitus, obesity), but it can also improve the symptomatology of existent chronic diseases, can improve general effort capacity (endurance), ensuring them ADL (*activities of daily living*) independence; they are thus able to take care of themselves, and last but not least, it develops the communication and social abilities, so useful at this time.
- Regardless of age and diseases, by prescribing a physical exercises program by the methodology specific to the elderly people, significant results can be seen after just 6 months; these results consist of the increase in effort resistance, improvement of articular mobility and muscle strength, improvement of balance and coordination, etc.
- Kinesitherapy holds the resources needed to draw-up and implement into the geriatric care and assistance system certain diversified kinetic programs, individualised, meant to ensure the improvement of the quality of life in old persons.
- Physical activity plays a prevention role and influences positively the functions of the cardiovascular, respiratory, digestive and nervous systems. By doing physical activity, the emotional tone is preserved and proper functionality is achieved, which ensures body adaptation to new situations;
- Physical activity helps preserving the psychical tone and proper functionality in organic systems is achieved, which ensures optimal body adaptation to physical stresses and nervous tension;
- Physical exercises used correctly ensures obvious physical relaxation, gives the toned feeling of usefulness, ability and independency to act.

Kinesitherapy sessions were carried out according to the scheme:

MONDAY	WEDNESDAY	FRIDAY
Cardio training program (by National Heart, Lung, and Blood Institute and the American Heart Association)	Training program (adapted by the multistratified protocol for testing on the ergometric bicycle)	Cardio-training program (by National Heart, Lung, and Blood Institute and the American Heart Association)

Objectives

- Reducing the risk of developing certain diseases (atherosclerosis, hypertension (HBP), osteoporosis, diabetes mellitus, etc);
- Preserving a psycho-affective ability within normal parameters and preventing depressive states;
- Increasing the anaerobic functional power or the maximum oxygen consumption rate (VO2max);
- Achieving a more economic work of heart and vessels (lower cardiac frequency);
- Reducing the energy cost for the same type of effort made;
- Developing the ability and desire to carry out effort in each session to the end.
- Preserving and improving effort capacity.

Methods

- Observation method;
- Explanation and practical demonstration methods;
- Conversation method.

Materials

- Ergometric bicycle
- treadmill

Means

- physical exercise (bike –pedalling, walking on the treadmill)

Specific methodology for assessment

- one-mile walk test ;
- physical activity index ;
- emotional distress.

Methodical indications

- Subjects under study were divided into 2 pair depending on the FC Max (maximum cardiac frequency) of each individual;
- The training was done at 70% of FC Max and it was stopped at any sign of discomfort of the patient;
- Pulse was monitored after each effort stage and the FC Max value was never exceeded;
- There was permanent communication with the patient, giving indications on how to do the effort during a training session;
- We mention that, at the first session, only 4 of them managed to finish training, showing signs of fatigue after about 10 minutes;
- The rhythm was the usual one, of walking on the street, and the walking acceleration was made depending on the individual possibilities of each subject;

- After the two months of training, a new testing was carried out to set further the approach for the cardio-training programs.
- Upon finishing the actual training, the final testing was made, noticing the notable evolution of subjects during the experiment.

Tables no 1 CARDIO TRAINING PROGRAM 1

Training stages	Training type	Dosage	FCM Maximum cardiac frequency
Warm up–5 min	Pedaling on the ergometric stationary bike	• level 1, with 25 W charge – 5 min.	75% of FCM
The actual aerobic training –20 min.	Stepper	• 3 min. in level 1	
	Rowing simulator	• 3 min. average charge • 3 min. break	
	Pedaling on the ergometric stationary bike	• 11 minutes in level 3 with a charge of 75 W	
Recuperating period following effort - 5 min.	Pedaling on the ergometric stationary bike	• 5 minutes in level 1 with a charge of 25 W.	

Tables no 2 CARDIO TRAINING PROGRAM 2

Warm-up	Obtaining the right pulse – 70 % of FCM	Come-back	Total time	Apparatus used
Normal walk for 5 minutes	Quick walk for 5 minutes	Normal walk for 5 minutes	15 minute s	Rolling carpet – inclination of 0^0
Normal walk for 5 minutes	Quick walk for 7 minutes	Normal walk for 5 minutes	17 minutes	
Normal walk for 5 minutes	Quick walk for 9 minutes	Normal walk for 5 minutes	19 minutes	
Normal walk for 5 minutes	Quick walk for 11 minutes	Normal walk for 5 minutes	21 minutes	
Normal walk for 5 minutes	Quick walk for 13 minutes	Normal walk for 5 minutes	23 minutes	
Normal walk for 5 minutes	Quick walk for 15 minutes	Normal walk for 5 minutes	25 minutes	
Normal walk for 5 minutes	Quick walk for 17 minutes	Normal walk for 5 minutes	27 minutes	
Normal walk for 5 minutes	Quick walk for 19 minutes	Normal walk for 5 minutes	29 minutes	

Results

In terms of the relation between physical fitness and psycho-affective state of the old people, data analysis showed a powerful, negative and statistically significant correlation at a threshold of 0, 01 (rho = - 0, 69 p < 0,001), between emotional distress (assessed by the Profile of Emotional Distress scale PDE) and physical fitness (assessed by the physical activity index) in the final testing phase.

The more the person experiences a larger number of dysfunctional emotions, the more the physical fitness is weaker.

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Tables no. 3 The corelation between physical fitness and psycho-affective state of the old people

		Scor PDE
physical fitness	Correlation coeffcient Spearman (rho)	-0,695**
	Level of significance (bilateral testing)	0,000
	N	40

** correlation is significant at a threshold of 0,01 (bilateral testing)

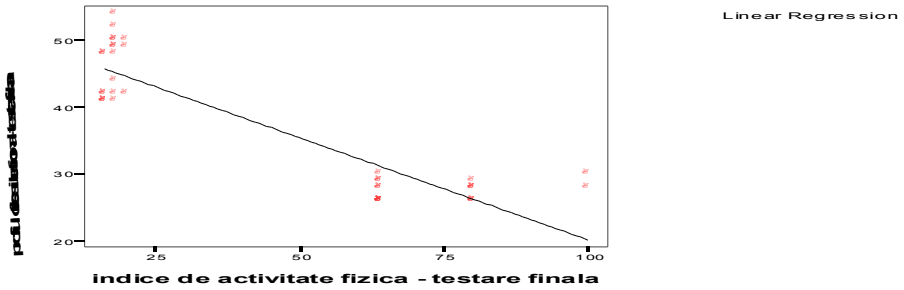

Figure no 1. The relation between physical fitness and psycho-affective state of the old people

As far as the relation between the psycho-affective state and the maximum oxygen consumption is concerned, data analysis showed a strong, negative and statistically significant at a correlation at a threshold of 0, 01 (rho = - 0, 74 p < 0,001), between emotional distress (assessed by the Profile of Emotional Distress PDE) and maximum oxygen consumption, in the final testing phase.

The more the person experiences a larger number of dysfunctional emotions, the more the maximum oxygen volume is higher.

Tables no. 4 The correlation between the psycho-affective state and the maximum oxygen consumption

		Score PDE – final testing
maximum oxygen volum final	Correlation coeffcient Spearman (rho)	-0,747**
	Level of significance (bilateral testing)	0,000
	N	40

**correlation is significant at a threshold of 0,01 (bilateral testing)

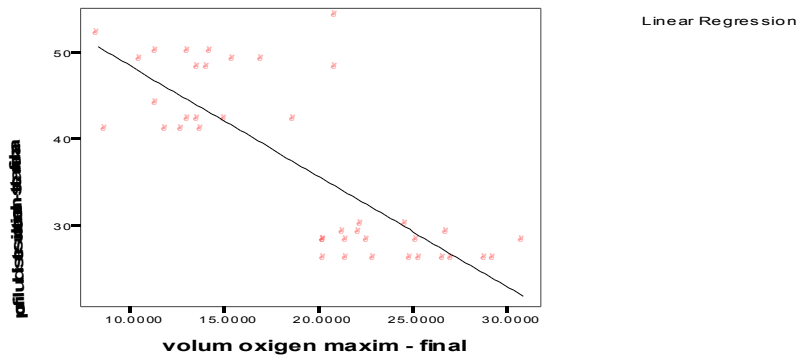

Figure 2. The correlation between *the psycho-affective state and the maximum oxygen consumption*

Discussion

- Experiencing certain kinesitherapy programs in elderly people assumes, on the one side, teamwork, and on the other side, special attention which should be paid to each reaction of the subjects under research during the experiment; the reactions may provide information on the old person's psycho-affective state, based on which the kinesitherapist can decide either to interrupt the program, or to change exercises or to increase their difficulty.
- Thus, the success of the kinetic intervention does not assume just the analysis of the final and initial outcomes, but also the follow-up of subject's behaviour during the experiment; it can sometimes give more details on the way in which the subject perceives effort, for instance, rather than by carrying out a simple test.
- Starting from this research's outcomes, there are various authors in the specialized literature who have confirmed the close connection between the effort capacity and the psychical factor in older people. Thus, Dr. Mavritsakis Nikolaos, 2008 claimed that physical exercise in older people does not only maintain the individual's physical state, but also his/her psychical one, thus a maintained effort capacity under normal parameters would condition a psychical comfort of the individual as well, he/she enjoying independency in current daily activities.
- To this effect also, Dr. Gheorghe Dumitru, 2006 promotes the principle of an active life in older people, underlying, at the same time in his studies, the close connection between the individual's effort capacity and their psychical side, stating that total independence at this age constitutes a sustained psychical comfort also, as well as an increase in life span.
- Sbenghe Tudor, 1999, supported the idea that maintaining effort capacity by aerobic training in older people gave them a good psychical state, shown by different aspects (wellbeing, decrease of depressive or anxious states, increase of intellectual capacity, sleep adjustment, higher ability to focus, increased availability for varied activities, etc).

Conclusions

1. For old people, physical rehabilitation is the quasi-mandatory condition for effort capacity's partial recovery, which would allow them to lead an active life, even if it shall be limited to solely taking care of themselves, do housework and the possibility to move on their own.
2. Generally, it is not the recovery of work skills that is aimed at, but the independent life, self-service skills, that would give them the feeling of confidence in own strength and the desire to be active in order to preserve health status.
3. Apart from the beneficial outcomes that movement has physically, there are also registered the outcomes on the older person's psychical and social side, manifested by the desire to communicate, to express experiences, to relate to the people around them, to participate in different activities, all these contributing to the removal of the feeling of loneliness, which is quite strong at this age;
4. To conclude, the more effort capacity is higher, the more psychical comfort is higher, negative psycho-affective states are more reduced, the old person feeling independent, good about themselves and useful to their family as well.
5. Physical inactivity and a sedentary lifestyle are a significant risk factor, damaging older persons' health status, fact which assumes the design of geriatric rehabilitation programs within every social care and assistance center, converted into well-structured kinetic programs, applied under optimal environment conditions and focused on specific objectives that would ensure:
   - Preserving adequate functional ability of an independent life;
   - Improving the quality of life;
   - Reducing the risk for developing certain diseases (high blood pressure, osteoporosis, diabetes mellitus, etc);
   - Slowing-down the chronic diseases progression;
   - Promoting psychological state of well-being and providing the opportunities to have an active social life;

Exploitation of outcomes and their implementation into the older persons' social care and assistance system;

- Optimisation of kinesitherapy activity within the social care and assistance centers for the elderly people;
- Promotion and spreading the movement concept as a way to remove the negative outcomes resulted from the ageing process and prolonging life span;
- Stimulation of the older persons' wish to practice systematically and in an organized

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fashion physical activity under different types, and to convince them of their beneficial outcomes.

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STRATEGIES FOR KINESITHERAPEUTIC INTERVENTION TO THE RECOVERY FROM ACHILES TENDON INJURY

RABOLU ELENA[1]

Abstract
The Achilles tendon rupture is one of the most frequent traumas in professional footballers and it requires an increased attention and a relatively large period for recovery.
Purpose- to optimize the recovery from Achilles tendon rupture by kinesic means.
Treatment methods: massage and medical gymnastics.
Results: improvement of pain, articular mobility and regaining muscle strength.
Conclusions: By applying correctly the kinesic means, rapid return to professional sport of the athletes under study was ensured (training and competition).
Key word: tendon rupture**,** physical therapy, pain.

Introduction

Football causes between 29 – 36% of the total sports traumas. Most specialized services in the country, but also abroad, group this specific pathology of the football game on three categories, namely (Drăgan, 1994):

- Macrotraumatic injuries
- Microtraumatic injuries
- Hyperfunctional injuries.

The methodical errors are among the favouring factors, materialized by unequal training of certain agonist groups, to the prejudice of the antagonist groups. Thus, the large number of muscle injuries in football, occurring particularly to the posterior musculature of the thigh, is due precisely to a large difference in tonus and strength of these groups, resulted from the negligence in training them, although the agonist muscle (quadriceps crural) is by far the most demanded in football (Dragan, 1994).

Nutritional deficiencies, hard weather conditions, inappropriate sports equipment, reduced biological potential due to abuses and non-sportive life are among the favouring causes, as well as errors in the recovery process. Triggering causes of muscle injury or tear can be the direct contusion caused by an opponent, but more frequently the internal opposing forces (muscle contraction or movement's sudden stop) or external (pushing the player by an opponent).

From 1970, the introduction of ultrasound methods and their impetuous development over the following years in clinical medicine made it possible, upon Wagner's effort and collab. Zuinen and collab. that, as of 1980 to find an objective method as well – ecomiography- by which the existence of muscle injury can be found as well (Drăgan, 1994).

Prophylactic treatment. The prevention of injuries and of ruptures of this kind is made by a very active lifestyle, dynamic, proper nutrition, removal of

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toxins from the body.

Treatment for Achilles tendon rupture

Functional disability caused by the surgical procedure at **Achilles tendon level,** along with the immobilisation period may result in sequalae: equinovarus deformity, joint block, inability to sustain the body and to perform gait, except heeled.

The modern opinion in posttraumatic recovery and especially in recovery from Achilles tendon injury no longer starts from the idea that subjacent, superjacent joints have to be mobilised at all costs, but from the need to regain normal muscle tone and strength; this is a mandatory condition for static and for walking.

The objectives of recovery:

- Treating and eliminating oedema;
- Toning the muscles, triceps surae muscles, especially to obtain the desired function;
- Toning the muscle groups that have been damaged by immobilisation, both in the uninjured lower limb and in the one in plaster bandage;
- Re-mobilising subjacent, superjacent joints (fingers, ankle, knees, hip);
- Stretching to relax the muscle groups in contracture or that tend to result in musculotendinous retraction (long stretch) (Pasztai Zoltan, 2001).
- Preventing defective compensating habits with the two well-established phases;

1) Post-operative phase with gradual recovery on stages, which last for a few weeks or even months,
2) The phase of preserving the compensation level gained, which lasts for the entire life. To assess the post-operative outcomes, Judeţ and Benssay suggested the following criteria:

- Oedema ;
- Pain (rated 0,1);
- Tibiotarsal mobility and stability (TT);
- Triceps' strength: toe and heel walk;

Recovery principles

The re-education, after the immobilisation is over, should be made very carefully, as there is the risk to unsettle the scar;

Recovery movements shall be solely active or active-assisted (not-passive!!!) – performed in neutral water, 37-38°C, until the elasticity, muscle and joint mobility is gained;

Voluntary contraction is the basic agent of mobilization. It has the following advantages:

- Helps to recover muscle elasticity;
- Is the most active element which determines blood's venous return from the periphery to the center;
- Fights against oedema;
- Favours the slips of different anatomical frames;
- Fights against venous stasis;

Recommendations concerning the Achilles tendon rupture

1. *Immediate actions- t*hese are the actions that need to be taken immediately after trauma, being related to the first-aid measures. Cold, moist gauzes are to be applied, at a temperature of 20 - 25°C and the patient is carried by other people, in order to prevent complications by bipodal posture. The leg is placed in a mild plantar flexion, 10 - 15° so as not to stress the injured tendon (it is recommended that the leg stays in the position in which it remained after the trauma suffered). All these actions are taken so as not to cause possible total rupture (from a partial one).

2. *Urgent actions*- these are the actions that are taken in 24-48 hours after the trauma's occurrence, and is the appanange of the surgeon.

3. Actions in the immobilization period- these are actions differentiated depending on the patient's status (kinesitherapy at the bed, hospital or at home). These actions differ also depending on the retention: femoral and podal, short or ice-type plaster bandage. In this phase of recovery, movements with the help of devices can be made: walking frame, axillary or Canadian crutches, and canes, without support on the injured lower limb in order to maintain the correct walking engram.

Purpose- to optimize the recovery from Achilles tendon rupture by kinesic means.

In athletes, especially after a period of interruption, the period needed for body's gradual return to maximum effort capacity is considered. Recovery from effort should be made on all levels – physical, metabolic, psychical, in terms of diet – and kinesic treatment of microtraumas should become a rule. (Pasztai, Z., 2001).

The research was made for 6 months on 2 professional footballers with Achilles tendon rupture, aged 24, respectively 27 years old.

The kinetic program was carried out 4 times per week, with duration of about 40 – 50 minutes, gradually increasing the repetitions number or their difficulty, depending on the stage, gravity and evolution of each subject's diagnosis. The existent organisational framework, as well as active and conscious participation of subjects facilitated the carry out of the research under good conditions.

Sports- medical anamnesis

Name: T. B.
Gender: male
Date of birth: year: 1985, month: July; day: 5
Address – Locality- Piteşti
Position: student
Sports classification: professional footballer
LIVING CONDITIONS:

Dwelling: At home
Diet: - hour – set depending on the training program

- excess - YES
- alcohol consumption – NO
- smoking - yes

TRAINING CONDITIONS:

- Gym, materials and equipment's hygiene: GOOD

Training schedule – set depending on the competition phase

- HEREDO - COLLATERAL CLINICAL RECORD (AHC)
- Pathological - NO

PERSONAL HISTORY:

- physiological: normal growth and physical development
- sport-related: he started playing football at age 6

FEATURES OF SUPERIOR NERVOUS ACTIVITY

- Workload: average
- Balance of psychical processes: good
- Mobility of psychical processes : good

ATHELETE'S CURRENT STATUS –trauma at ankle level.

Diagnosis: **Achilles tendon rupture.**
Along with anamnesis and after making the initial diagnosis, we shall draw-up the individualized recovery program.
The kinetic program was carried out at three weeks after surgery.
Objectives:

- Regaining articular mobility;
- Regaining strength and muscle tone;
- Controlling the inflammatory process and fighting against pain;
- Reducing to the minimum the effects induced by kinetic activity's interruption;
- Restoring muscle coordination typical to the motor activities specific to the sport played;
- Improving effort capacity;
- Return to sport (training and competitions) by setting fitness and warm-up programs.

Specific methods for assessment

- Assessment of articular movement's total range of motion;
- Iordănescu Baciu assessment scale
- Pain assessment scale 0-5

Means: physical exercise

I. Exercises program to recover from the Achilles tendon rupture

DAYS 1-5

1. From a dorsal decubitus position, a flexion and a plantar extension are made (alternately 2 x 10 repetitions with the injured limb);
2. From a dorsal decubitus position, the pedal is pushed with counter –resistance (alternately 2 x 10 repetitions with the injured limb);
3. Walking with support between two parallel bars (2 x 3) ;
4. From a sitting position, deep inspiration, moving the upper limbs sideways and upon expiration, taking them close to the body (2 x 10).

DAYS 6-11

1. From a bipodal position, feet slightly spread, torso pushed in front, with support on hands at one bar, toe-lift is done, and from this position, shifts from one leg to the other are done (alternately 2 x 10 repetitions with the injured limb, then with the uninjured one);
2. from a dorsal decubitus position, lower limb is slightly lifted at 15-20^{o} and held for 5 seconds and flexion- extension of the leg is made (alternately 2 x 10 repetitions with the injured limb, and then with the uninjured one);
3. legs on the ground, at an arm's length from the wall, body is slightly bent forward, keeping it straight in the front; from this position is made the return to vertical position by contracting the triceps surae muscle 2 x 10 repetitions with the injured limb, and then with the uninjured one;
4. heel walking on the post-external side, foot in dorsal flexion and in supined posture (alternately 2 x 10 meters with the injured limb and then with the uninjured one);
5. from dorsal decubitus position, ankle abduction exercises are made, without and with opposing resistance (for the lateral short peroneal muscle), simultaneously (2 x 10);
6. walking with support between two parallel bars (2 x3);
7. normal walk on two lines traced on the carpet (2 x 3);
8. from sitting position, deep inspiration, moving the upper limbs sideways and expiration upon taking them close to the body (2 x 10).

DAYS 12-17

1. from dorsal decubitus position, doing leg flexions and extensions with 1,5 kg

sandbags tied to the ankles (alternately 2 x 10 repetitions with the injured limb);
2. from standing position, face against the wall at an arm's length, arms are flexed, coming closer to the wall, heels do not detach from the ground, lift, holding the leg for 5 seconds (alternately 2 x 10 repetitions with the injured limb);
3. Position on the knees with posterior on the lower legs, feet on the ground with dorsal- external side;
4. from an upright posture, toe-lift is done (2 x 10);
5. normal walking on the lines traced on the carpet (2 x 3);
6. from standing position, deep inspiration, moving the upper limbs sideways and expiration upon taking them close to the body (2 x 10).

DAYS 18-25

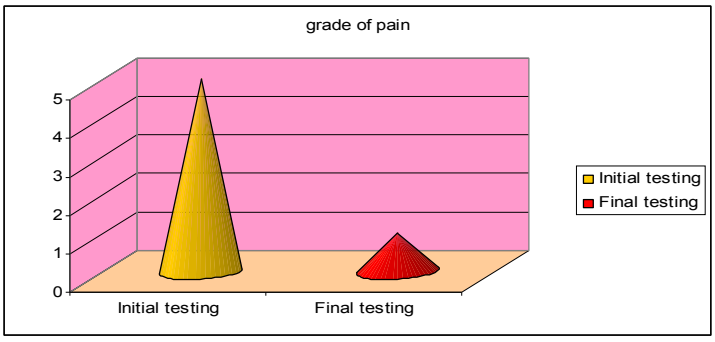
1. great toe extension with a belt, band, etc (alternately 2 x 10 repetitions with the injured limb, then with the uninjured one);
2. from dorsal decubitus position, with two dumbbells weighing 2,5 kg tied to the ankle, lower limb is slightly lifted at 15-20^{o} and held in that position for 5 seconds with leg flexion – extension (alternately 10 repetitions with the injured limb and then with the uninjured one);
3. toe-lift with a barbell on the back with variable weight (alternately 2 x 10 repetitions with the injured limb, then with the uninjured one);
4. dorsal and plantar flexion, inversion and eversion, abduction and adduction, leg circumdiction, as well a flexion done with more difficult repetitions (alternately 2 x 10 repetitions with the injured limb, then with the uninjured one);
5. from standing position faced against the espalier, forefoot on a sandbag, heel on the ground, the healthy leg is lifted as high as possible on a bar of the espalier (2 x 10);
6. normal walking on two lines traced on the carpet, having 2,5 kg sandbags tied to the ankles (2 x 3);
7. stepper exercises (3 x 5 min);
8. running on a track with a 10^{o} incline (3 x 10min);
9. stationary bike pedalling by gradually increasing pedalling difficulty, 2 x 10 minutes;
10. from standing position, deep inspiration, moving the upper limbs sideways and expiration by taking them close to the body (2 x 10 rep.).

Rezults

1. Assessment of pain scale

	Initial testing	Final testing
grade of pain	5	1

Table no. 1 assessment of pain scale



Graphic no. 1 assessment of pain scale

In terms of pain scale, a reduction in pain is seen toward the end of the recovery period, fact resulting from the kinetic program's effectiveness, combined with medication therapy.

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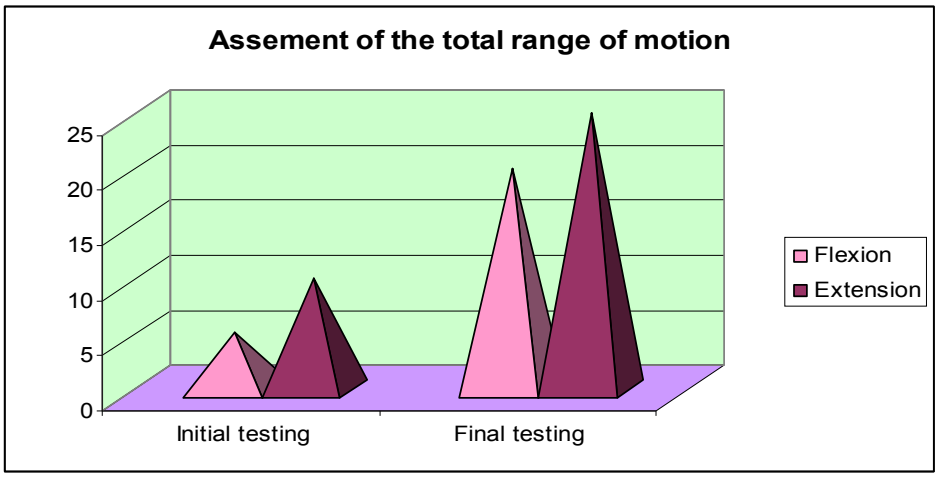
2. Assessment of the total range of motion

articular movement	Initial testing	Final testing
Flexion	**5**	**20**
Extension	**10**	**25**

Table no. 2 Assessment of the total range of motion

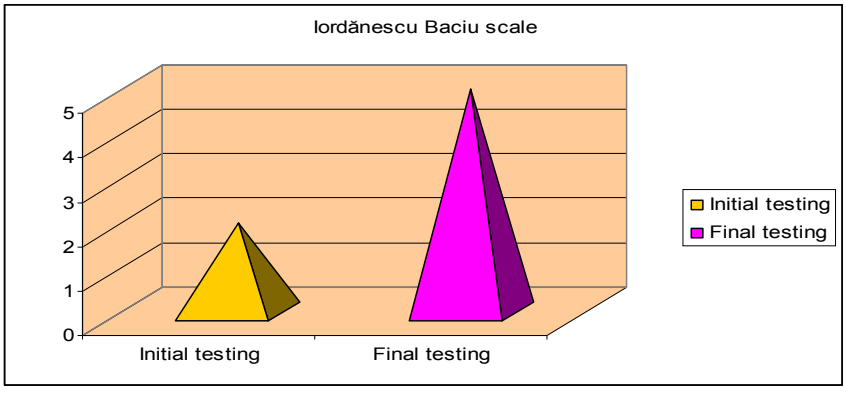


Graphic no. 2 Assessment of the total range of motion

Articular movement registers an increase by 15^0 on flexion and 15^0 on extension, the athlete being able to return to training at a low intensity after 6 months of recovery, as compared with an unusual training.

3. Assessment of muscle strength

	Initial testing	Final testing
Iordănescu Baciu scale	2	5



Graphic no. 3 Iordănescu Baciu scale

As far as muscle strength is concerned, it increased, as seen on the scheme, from 2 to 4 on Iordănescu Baciu's scale, the resulted movement being of normal range and strength; they maintain at optimal parameters, as long as there is activity occurring.

Discussions

- The foot has a great static and dynamic role, being the key factor for locomotion. It represents, along with the ankle, an anatomo-functional complex meant to support the entire weight of the body and to ensure walking under any circumstance. This is why

ankle's joint trauma sequalae, which comprises all the anatomical elements (tegument, ligaments, muscles, tendons, vessels and nerves) are very important and problematic in terms of recovery.

- Data gathered in the first consult help establish treatment and recovery program, which should be early, complete and uninterrupted.
- The means used have to stop the inflammatory process, fight against pain, to help in relaxation, posture and medical gymnastics.
- Sports activity will always lay accent both on patient's return to sport as soon as possible, without neglecting the three recovery stages, and on preventing recurrences. Athletes will be thus recommended to:
  - do warm-up and stretching exercises: before any intense sports or physical activity, warm-up exercises should be done for 5 to 10 minutes, as well as walk on the bicycle, stretching the lower legs that will prepare
  - Achilles tendon and muscles for subsequent activity;
  - stretches working on different muscle groups can also be done;
  - avoid any sports or physical activity that the body couldn't face;
  - wear shoes protecting the heel, comfortable and adapted for physical activity;
  - wear orthopedic devices that reduce overstraining the Achilles tendon.
- Leontescu (2011) thinks that kinetic recovery is an important part of this injury's treatment by passive and active exercises to remobilize ankle's joint, and not just that of the injured limb, but of the uninjured one as well.
- Sbenghe (1987) supports the idea according to which recovery from a tendon rupture depends upon the correctness of the kinetic treatment applied, on the observance of kinetic objectives, and on the careful selection of recovery methods and techniques.

Conclusions

- By applying correctly the recovery methods, rapid recovery of the athletes under research (case studies) to professional sport (training and competition) was ensured.
- Ensuring kinesitherapeutic treatment was made considering the requirements of ensuring continuity, rhythmicity and consistency within kinesitherapy sessions.
- By carrying out the kinetic treatment proposed, apart from the correct recovery of injuries, reduction in the frequency of muscle pain's occurrence, increase of articular mobility and muscle strength were obtained.
- Upon finalizing research and analysis of the results obtained, we can strongly state that the use of means specific to kinesitherapy successfully contribute to the optimization of return to professional sport of athletes having physical traumas.
- The base for medical recovery is patient's assessment. Special accent should be laid on pointing out dysfunctions and their assessment. Recuperating assessment should be thorough, the aim of recovery being to develop fully physical, mental social and professional abilities of the patient.
- Muscle toning is simple, monotonous and long- lasting. This is why one of the conditions to get an effective therapy is to gain the patient's collaboration and to persuade them on the necessity of perseverance and continuing treatment on a period of time. The patient's recovery is pursued up to "restitutio ad integrum''.

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