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Original article

COMPARATIVE STUDY REGARDING THE GESTATIONAL AND POSTPARTUM PERIOD OF TWO PATIENTS FROM PHYSICAL EXERCISES PRACTICE PERSPECTIVE

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Abstract

Physical activity is defined as any form of body movement, generated by the skeletal muscles and which determines energetic consume.

The physical activity in daily life includes professional, sportive or domestic activities. For body's physical capacities maintenance is necessary the study and implementation of a physical activity subcategory named physical exercise, which requires a structure, planning and cyclicity and it has as final objective the optimum of health level and homeostasis.

Forwards we wish to present two case studies which can highlight the advantages and disadvantages of physical exercise practice versus a sedentary life style, during the prepartum period and their implications in postpartum period.

Key words: physical activity, prepartum period, postpartum period.

Introduction

In compliance with the recent researches upon the daily physical activities and leisure practice, the minimum intensity levels recommended by the international health guides are not sufficient anymore, in order to diminish the risks of cardiovascular, respiratory, muscular and articular diseases occurrence, or even the metabolic ones. Physical activity is defined as any form of body movement, generated by the skeletal muscles and which determines energetic consume.

The physical activity in daily life includes professional, sportive or domestic activities. For body's physical capacities maintenance is necessary the study and implementation of a physical activity subcategory named physical exercise, which requires a structure, planning and cyclicity and it has as final objective the optimum of health level and homeostasis.

According to 2010-2015 studies, healthy pregnant women should practice physical exercises minimum 150 minutes per week (20-30 minutes per day), with a moderate to high intensity, in order to prevent or decrease the effects of blood high pressure, gestational diabetes, preeclampsia, urinary incontinence or obesity.

Forwards we wish to present two case studies which can highlight the advantages and disadvantages of physical exercise practice versus a sedentary life style, during the prepartum period and their implications in postpartum period.

Case study 1

28 years old patient, living in country side in a surrounding area of Constanta, college graduated, of satisfactory financial income and a normal physical

condition (volleyball player until 18 years old, when she stopped physical exercises practice).

Following an evaluation questionnaire of the patient's socio-psycho-morphological context prior pregnancy, the next data were registered:

- Mainly sedentary life style;
- Body mass included her into underweight category;
- Clinically healthy, without notable medical history;
- Day and night shifts at the working place;
- Due to her working place specific, the tobacco and alcohol consume was favored (her professional activity consisting in tobacco products promotion inside the night bar and clubs of Constanta and Mamaia Resort);
- An increased level of fatigue due to loss of sleep during nights. The gestational period went well until week 30, without events or notable symptoms. In the 30th week, a medical control noticed a significant high blood pressure value which required an attentive monitoring. After more investigations the high blood pressure diagnose was obtained and, on the background of a shorten cervix, as the patient's gynecologist stated, the pregnancy was declared with high risk, so the patient had recommendation of permanent bed rest, with no physical activity. Due to last 10 weeks of pregnancy restrictions regarding physical exercises, with the absence of movement, the subject gained plus 30 kilograms corporal mass. Cesarean section was necessary for giving birth, because of high blood pressure values, which developed without complications, the patient being discharged from hospital shortly after the surgery. Following the C section evaluation, the patient received the

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recommendation to only have daily domestic physical activities for 60 days, then to start the specific postpartum physical exercises.

After 60 days of restrictions, the subject started a personalized postpartum training which had as objectives to regain the physical effort capacity anterior to pregnancy, muscular tonifying and physiologic blood pressure values. These objectives were obtained at 6 months after giving birth, the patient had a normal corporal stabilization at 57 kilograms (with underweight level of 52 kilograms prior pregnancy) and no high blood pressure values.

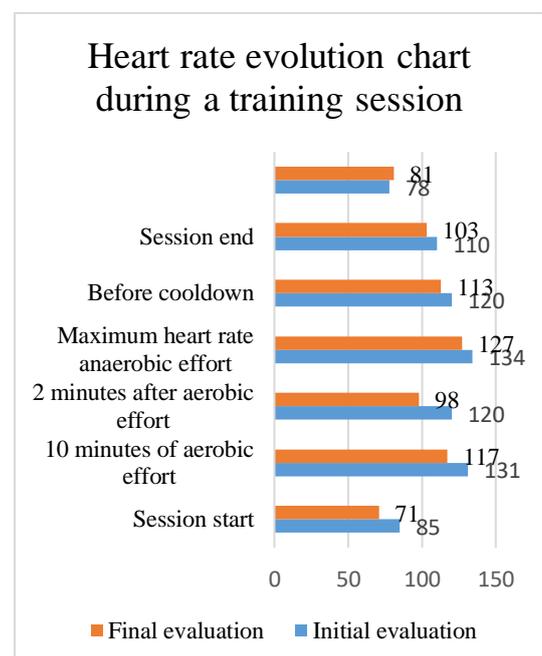
The following information resulted after measurements were taken both at the beginning of the postpartum training program and at its end.

Chart of scores achieved at strength tests with digital dynamometer BioFeet V3

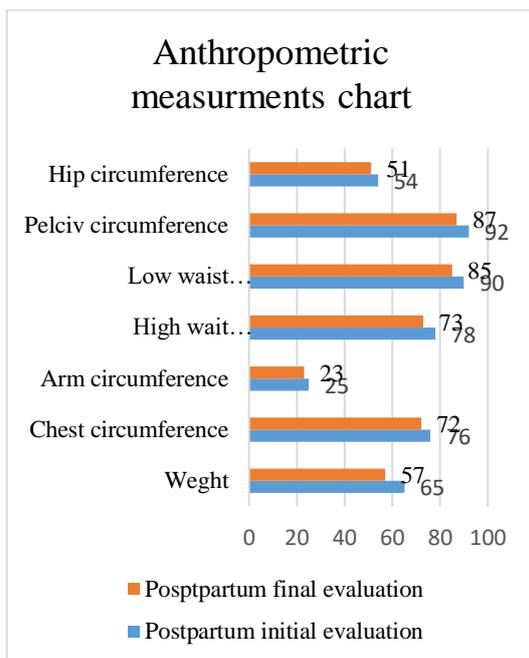
Test	Initial postpartum training program strength evaluation	Final postpartum training program strength evaluation
Knee extension	17,51	23,22
Knee flexion	12,47	17,74
Shoulder extension	10,8	17,15
Shoulder flexion	9,43	14,02

	Postpartum initial evaluation	Postpartum final evaluation
Heart rate at the beginning of session	85 bpm	76 bpm
Heart rate after 10 minutes of aerobic effort	131 bpm	117 bpm
Heart rate 2 minutes after the end of aerobic effort	120 bpm	98 bpm

Maximum heart rate during anaerobic effort	134 bpm	127 bpm
Heart rate 2 minutes after maximum heart rate during anaerobic effort	120 bpm	113 bpm
Heart rate before cooldown	110 bpm	103 bpm
Heart rate after cooldown	78 bpm	81 bpm



Changes during pregnancy	Changes at the end of postpartum training program
high blood pressure	regular blood pressure (no variations)
lumbar discomfort (lumbar lordosis aggravation)	no reported lumbar pain
muscle spasms	muscle spasms improvement
limited upper body mobility (torso anterior flexion)	restored upper body mobility



Final opinions based on postpartum training period information.

Studying the data of this case, the following can be stated:

- ✓ Although a young person, at the first pregnancy, without medical history, the life style, the working environment and the tobacco and alcohol dependency can significantly influence the general healthy, the gestational period evolution and the body recovery during the postpartum time;
- ✓ Inappropriate rest, underweight corporal mass, lack of physical activity and frequent tobacco and alcohol intake determine a decrease of the life quality during the gestational period and could cause symptoms that affect the pregnancy, with the risk of losing it;
- ✓ According to the gynecologist data, C section was necessary due to high blood pressure values, determined by the disruptive factors prior depicted and which could have been avoided, by an increased attention upon the life style.

Case study 2

29 years patient, living in an urban environment, college graduated, financially very well, normal physical condition.

Following an evaluation questionnaire of the patient's socio-psycho-morphological context prior pregnancy, the next data were registered:

- Normal body weight, mainly sedentary life style;
- Clinically healthy, with no medical history;
- Reduced domestic physical activity;
- The subject practiced fitness type physical exercises, 2-3 sessions per week;
- Non smoker, rare alcohol intake;
- Fatigue and stress levels in normal limits.

After getting pregnant and following a specialty control at gynecologist, the patient decided to attend a personalized training program during the gestational period, with the gynecologist approval and family support. All her pregnancy period she performed physical exercises, guided by the specialist, without any difficulties regarding the effort intensity, muscular or joint pain and the body recovery after each training session went well. At the end of pregnancy period, she gained only 12 kilograms body mass surplus, due to physical activity, proper rest time and alimentation.

By remaining active and eating healthy during the gestational period, the pregnancy had a favorable evolution and ended with a natural birth and no complications. In this way, the subject was able after 30 days to attend a physical exercises postpartum program.

The physical effort capacity that she had after pregnancy allowed her a rapid recovery and the amelioration of all specific symptoms. After 6 months postpartum, the patient weighted 60 kilograms, close to 58 kilograms, how much she had prior getting pregnant, although one of the physical training program objectives was the myofibrillar hypertrophy, which determines an increase of muscular density and same time a proportional weight gain.

The following information resulted after measurements were taken both at the beginning of the postpartum training program and at its end.

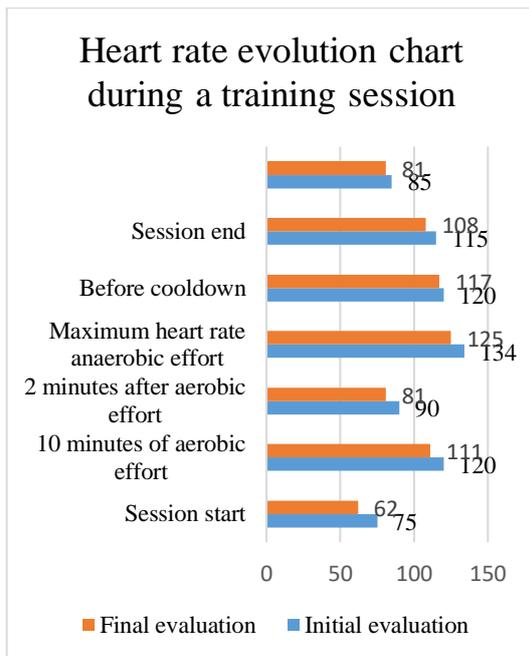
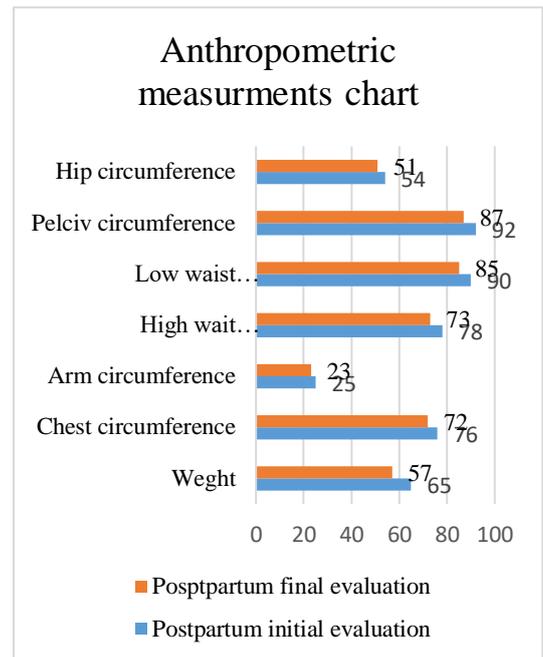
Chart of scores achieved at strength tests with digital dynamometer BioFeet V3

Test	Initial postpartum training program strength evaluation	Final postpartum training program strength evaluation
Knee extension	6,53	9,21
Knee flexion	7,3	13,52
Shoulder extension	9,34	13,29
Shoulder flexion	7,76	14,74

Heart rate evolution in beats per minute during a training session

	Postpartum initial evaluation	Postpartum final evaluation
Heart rate at the beginning of session	75 bpm	62 bpm

Heart rate after 10 minutes of aerobic effort	120 bpm	111 bpm
Heart rate 2 minutes after the end of aerobic effort	90 bpm	81 bpm
Maximum heart rate during anaerobic effort	134 bpm	125 bpm
Heart rate 2 minutes after maximum heart rate during anaerobic effort	120 bpm	117 bpm
Heart rate before cooldown	115 bpm	108 bpm
Heart rate after cooldown	85 bpm	81 bpm



Changes during pregnancy	Changes at the end of postpartum training program
lumbar discomfort (lumbar lordosis aggravation)	no reported lumbar pain
muscle spasms	muscle spasms improvement
limited upper body mobility (torso anterior flexion)	restored upper body mobility

Final opinions based on postpartum training period information.

Studying the data of this case, the following can be stated:

- It can be observed a significant evolution of physical effort capacity, body circumferences and fitness level, also an increase in life quality during postpartum period;
- This results were obtained due to an equilibrate way of life prior pregnancy and to the fact that the patient practiced adapted physical exercises the whole gestational period, which favored a rapid postpartum recovery.

Either morphophysiological parameters or strength capacity in both patients were improved after the following postpartum physical training program model was applied.

Postpartum physical training targets and period

These main goals resulted after analyzing the information obtained:

1. Individual and combined psiho-motricity capacity development
2. Spinal postural imbalance improvement
3. Muscular flexibility and joint mobility recovery
4. Both aerobic and anaerobic strength capacity development

Postpartum physical training period

The training macrocycle was split in the following 4 mesocycles:

- a) Mesocycle I - Anatomical adaptation in a 12 weeks period

This mesocycle was split in 3 micro cycles, each of 4 weeks. Every one of them was run in 3+1 system (3 weeks of progressive overload and 1 week of recovery). The 3 training sessions were spread over one week as follows:

- 2 general strength training sessions (A1)
- 1 mobility and aerobic endurance session (A2)

Weekly planning	
Monday	A1
Tuesday	
Wednesday	A2
Thursday	
Friday	A1
Saturday	
Sunday	

- b) Mesocycle II and III - Myofibrillar hypertrophy

These mesocycles were based on the same structure as mesocycle I (12 weeks on a 3+1 system). The difference between the two micro cycles consisted in weekly training session number and spreading the targeted muscle groups on distinct days. Mesocycle II was based on 4 weekly training sessions divided as following:

- One session for lower body hypertrophy (A1)
- One session for mobility and aerobic endurance (A2)
- One session for upper body hypertrophy (A3)
- One session for mobility and aerobic endurance (A2)

Weekly planning	
Monday	A1
Tuesday	A2
Wednesday	
Thursday	A3
Friday	A2
Saturday	
Sunday	

- a) Mesocycle III was based on 5 weekly training sessions divided as following:

- one session for upper body hypertrophy with strong attention to pectoral muscle, deltoids and triceps (A1-push)
- one session for mobility and aerobic endurance (A2)

- one session for lower body hypertrophy (A3-legs)
- one session for mobility and aerobic endurance (A2)
- one session for upper body hypertrophy with strong attention on the entire dorsal musculature and biceps (A4-pull)

Weekly planning	
Monday	A1(push)
Tuesday	A2
Wednesday	A3(legs)
Thursday	A2
Friday	A4(pull)
Saturday	
Sunday	

At the end of mesocycle III the female patients were subjects to a new evaluation related to both strength capacity and heart rate and anthropometric measurements and the results were definitely improved in all aspects.

Discussions

Analyzing the two cases, notable differences can be marked, even similarities exist, like same age group, both subjects at the first pregnancy with no medical history or associated diseases.

Although the first subject practiced regulated physical exercises and was member of a volleyball team until 18 years old, the ulterior lack of physical activity, combined with a way of life which presumed working nights, an underweight body mass, the intake of tobacco and alcohol had developed an uncertain evolution and even a high degree of pregnancy risk, fact that determined a C section with many emotions. The factors which contributed at the patient's quality of life diminishing were high blood pressure, severe movement limitation, with decubitus dorsal permanent maintenance in the last 10 pregnancy weeks; corporal excess, which stressed the entire muscular-skeletal system and slowed the postpartum recovery.

In opposition, the second studied subject, despite having a preponderant sedentary life style, was able to obtain a significantly better pregnancy evolution, by the implementation of a healthy life style prior the gestational period and during it and also by practicing adapted physical exercises in this time, with a higher quality of life in pre and postpartum period. Due to these positive aspects, connected with a healthy equilibrated way of living, the patient maintained an optimum body weight the whole pregnancy (only 12 kilograms gained), which favored a rapid postpartum recovery of physical effort capacity, corporal circumferences, general tonus and quality of life.



Conclusions

Physical inactivity, combined with a chaotic life style, mixed with alcohol and tobacco intake and non sleeping nights, plus an underweight corporal mass can determine an uncertain pregnancy evolution, although the person is not diagnosed with associated diseases and it can be presumed that the gestational period will develop normally.

Sedentariness associated with dependencies can determine complications, even at young women who

were declared clinically healthy at the preliminary evaluation with no pregnancy risk.

The physical exercise practice by a preponderant sedentary patient prior and during gestational period can positively influence the quality of life and bring the pregnancy an evolution without complications.

The positive effects of physical exercise, performed by the pregnant women can be marked as much as during the gestational period and also after it, by a rapid recovery of physical effort capacity and body morpho-functional parameters.

References

- Caspersen CJ, Powell KE, 1985, Cheristenson GM, Physical activity, exercise and psysical fitness: definitions and distinctions for health-related research. *Public Health Rep.* 100:126-131.
- Ferrari N & Graf C, 2017, *Bewegungsempfehlungenfür Frauen während und nach der Schwangerschaft. Das Gesundheitswesen*, 79(S 01), S36–S39. doi:10.1055/s-0042-123698
- Dragnea A, Bota A, 1999, *Teoria activităților motrice*, Editura Didactică și Pedagogică, București;
- González K, Fuentes J, & Márquez JL, 2017, *Physical Inactivity, Sedentary Behavior and Chronic Diseases. Korean Journal of Family Medicine*, 38(3), 111. doi:10.4082/kjfm.2017.38.3.111