THE STUDY ON THE IMPACT OF PHYSICAL EXERCISE IN THE PREPARTUM AND POSTPARTUM PERIOD

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Abstract: *Worldwide, statistical data on natural increase highlight the fact that the number of births is twice as high as the number of deaths reported annually, and this index is continuously increasing in favor of the birth rate. In Romania, however, the phenomenon is as follows: in 2015, the population was 19,870,647 inhabitants and will decrease by 17.8% until 2050, reaching 16,331,359 inhabitants.*

Keywords: physical exercise, birth, prepartum, postpartum.

INTRODUCTION

The present study was carried out from the need for a better understanding of the impact of physical exercise on women in the postpartum period and from the desire to develop a periodization of physical exercise according to certain specific parameters (the previous level of physical training of the subject, the evolution of the pregnancy, the type birth).

In this context, we can affirm the fact that special attention must be paid to this complex process which is represented by conception, the prepartum period, birth and the postpartum period. The scientific studies carried out regarding the physical exercises that are performed during pregnancy have led to an important development of knowledge in this field. Research to date reveals benefits that include reduced caesarean section rates, adequate maternal and fetal weight gain, and reduced incidence of gestational diabetes.

The purpose of this study is to analyze and highlight the impact of physical exercises practiced in the prepartum and postpartum period by a group of pregnant women who can be a representative sample whose data can be extrapolated to the level of the entire statistical population in Romania.

Following this analysis, we propose to highlight the beneficial effects of physical exercises practiced in the postpartum period, to develop a model of periodization of physical

exercise and the method of individualized implementation according to the particularities of the subject.

Case Study

We present the case of a patient C.C. 28 years old, living in the countryside, high school graduate and with a very good declared income level.

The subject was in her second pregnancy, had a normal weight level before the conception of the second pregnancy and a sedentary lifestyle largely determined by the professional activity carried out. Both during the first pregnancy and during the second, the pregnant woman complained of pain in the lumbar area caused by very large weight gain (50 extra kg in the first pregnancy and 24 kg in the second). The birth proceeded normally by caesarean section without any other complications. Following the surgical intervention, the subject had the gynecologist's opinion to practice physical exercises after at least 60 days after birth and showing increased attention to the overloading of the abdominal muscles.

After the 60 days from the cesarean section, at the recommendation of the gynecologist and encouraged by the family, the patient intends to start a physical exercise program dedicated to the postpartum period. This program starts with an anamnesis in which anthropometric measurements are taken, the initial level of fitness is determined with the help of specific tests and the perception of the evolution of the pregnancy is evaluated with the help of a questionnaire in order to identify the body changes perceived by the patient during the gestational period.

Periodization of physical exercise

The postpartum training program brought together 4 stages and took place for 24 weeks in the 3 + 1 system (3 weeks of loading + one week of active recovery).

3.1. Stage I It took place over the course of 8 weeks and had as its main objective the adaptation of the body to effort, the regaining of joint mobility and muscle elasticity and the development of aerobic exercise capacity. One week included 2 training sessions for anatomical adaptation and general strength (A1) and one training session for the development of aerobic endurance and mobility (A2).

Weekly planning of physical exercise in stage I Table 1

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

3.2. Stage II

It had as its main objective the toning of the muscles of the upper body and the lower body, but also the continuation of the development of aerobic resistance and mobility. At this stage, the weekly planning included 4 training sessions as follows:
-a muscle toning session with emphasis on the lower body (A1)
-a session developing aerobic resistance and mobility (A2)
-a muscle toning session with emphasis on the upper body (A3)
-a session developing aerobic resistance and mobility (A2)

Weekly planning of physical exercise in stage II Table 2

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

3.3. Stage III

It consisted of 5 training sessions per week and had as its main objective the development of strength with an emphasis on the development of the upper body by grouping the agonist muscles in the same training session due to the fact that most women, in general and postpartum women in particular they are deficient in the upper body and abdominal muscles. The training sessions were distributed as follows:
- a session on the development of the upper body muscles with emphasis on the pectoral muscles, deltoids, triceps and the upper area of the abdominal muscles (A1-push day)
-a session developing aerobic resistance and mobility (A2)
-a lower leg muscle development session (A3-legs day)
-a session developing aerobic resistance and mobility (A2)
-a session developing the muscles of the upper body with emphasis on the entire back muscles, biceps and the lower area of the abdominal muscles (A4- pull day).

Weekly planning of physical exercise in stage III Table 3

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

3.4. Stage IV

This stage was made up of 2 weeks intended for a transition period that facilitated the entry into a new training cycle if the subject wanted to continue the postpartum training and establish together with the program coordinator a new goal to achieve. At this stage, physical exercise was not completely interrupted, but alternative means of practicing physical effort could be chosen depending on the particularities and preferences of each individual subject. Examples: swimming, cycling, various aerobics classes, water sports, mountain hiking, skiing, etc.

Table 4

Comparative results between changes felt during pregnancy and those felt at the end of the postpartum training program

Changes felt during pregnancy	**Changes felt at the end of the postpartum preparation program**
• fluctuations in blood pressure	• normal blood pressure (no fluctuations)
• discomfort in the lumbar area (increased lumbar lordosis)	• no pain was reported in the lumbar area
• accumulated 24kg during the entire pregnancy	• return to the pre-pregnancy weight level
• major water retention	• significant reduction of water retention
• limitation of the mobility of the whole organism	• regaining bodily mobility

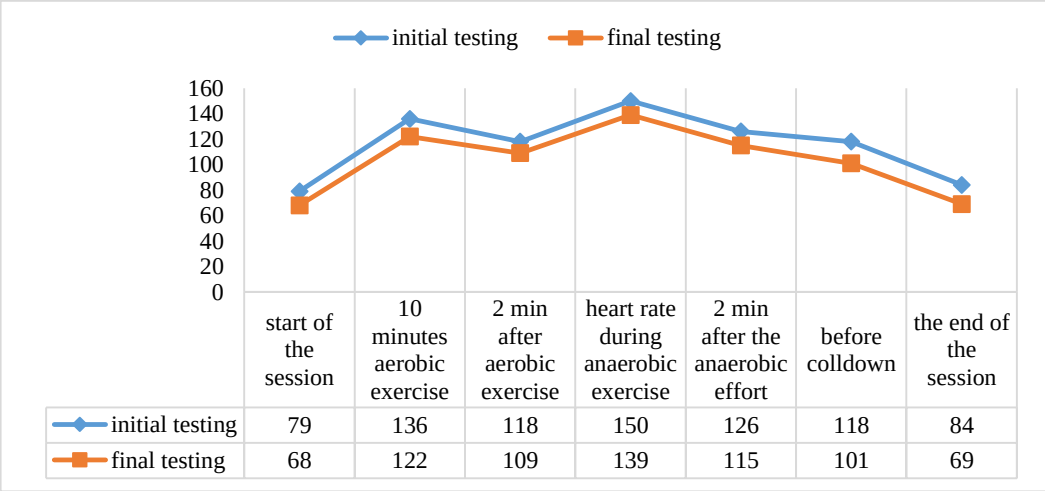
Results of strength testing during the postpartum physical training program *Table 5*

Test	**Strength testing at entry into the postpartum physical training program**	**Strength testing after completing the postpartum training program**
Knee extension	6,08 kg	13,61 kg
Knee flexion	7,35 kg	13,11 kg
Shoulder extension	9,48 kg	14,79 kg
Shoulder flexion	6,17 kg	9,84 kg

Table 6

The evolution of heart rate expressed in beats per minute during a training session – C.C.

	Hr. at the beginning of the meeting	Ht. after 10 min. aerobic exercise	Hr. after 2 min. from the cessation of aerobic exercise	Hr. max. during anaerobic exercise	Hr. after 2 min. from fc. max. in anaerobic exercise	Hr. before cooldown	Hr. after cooldown
Initial postpartum testing	79 bpm	136 bpm	118 bpm	150 bpm	126 bpm	118bpm	84bpm
Final postpartum testing	68 bpm	122 bpm	109 bpm	139 bpm	115 bpm	101 bpm	69 bpm



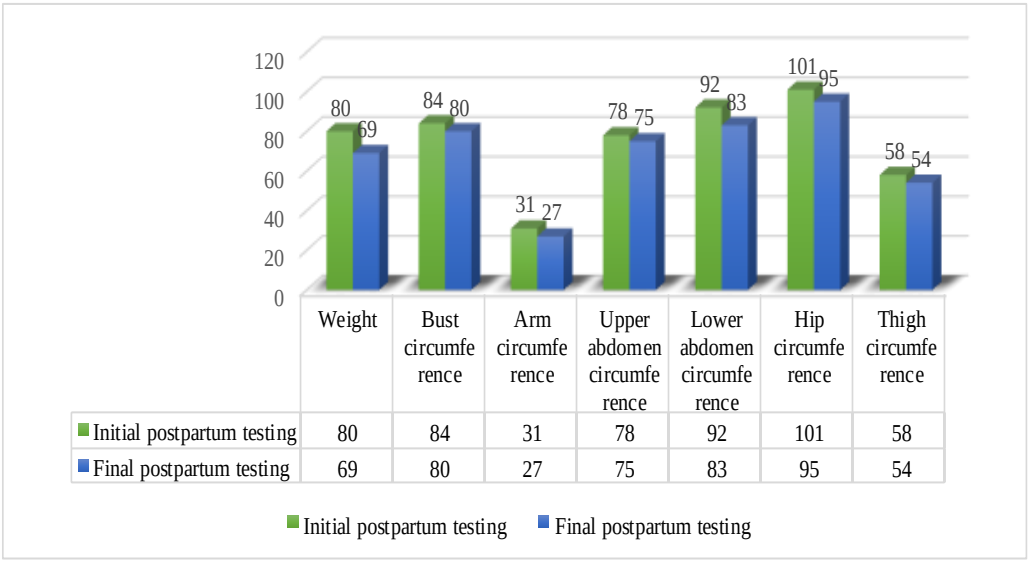
	start of the session	10 minutes aerobic exercise	2 min after aerobic exercise	heart rate during anaerobic exercise	2 min after the anaerobic effort	before colldown	the end of the session
initial testing	79	136	118	150	126	118	84
final testing	68	122	109	139	115	101	69

Chart 1. *Graph of heart rate evolution during a training session*

Table 7

The results obtained after the application of specific tests in order to establish the level of postpartum fitness - C.C.

	Postpartum fitness level testing	Fitness level testing 6 months after birth
The Flamingo Test	15 attempts	19 attempts
Flexion of the trunk on the pelvis	-6 cm	+2cm
Raising the trunk from the sitting position	9 repetitions	18 repetitions
General qualification	Weak	Good



	Weight	Bust circumference	Arm circumference	Upper abdomen circumference	Lower abdomen circumference	Hip circumference	Thigh circumference
Initial postpartum testing	80	84	31	78	92	101	58
Final postpartum testing	69	80	27	75	83	95	54

Initial postpartum testing Final postpartum testing

Chart 2. *Graph of anthropometric measurements*

CONCLUSIONS

The present study offers us the opportunity to analyze the effect of implementing a personalized postpartum physical training program in a multiparous patient.

Following the data obtained, we can highlight the fact that the proposed physical training program had a significant contribution to the improvement of the patient's quality of life by improving blood pressure values and pain felt in the lumbar area, reducing water retention in the body and weight level, as well as regaining mobility articulation.

In terms of strength an improvement in both upper body and lower body strength was seen along with improvement in fitness level.

Heart rate measured at 7 different times during a training session was improved during both aerobic and anaerobic exercise.

Anthropometric measurements performed at the beginning and at the end of the postpartum training program show an improvement in all monitored circumferences as well as body weight.

Exercise during pregnancy is safe and desirable, and pregnant women should be encouraged to continue or initiate safe exercise under the careful guidance of a specialist.

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