MOTOR PROGRAM FOR PATIENTS WITH CHRONIC LUMBOSACRAL PAIN

(Preliminary communication)

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Abstract
The aim of this study was to establish and evaluate the effect of a motor exercise program to reduce chronic low-back pain syndrome and functional recovery of the spine in postmenopausal women with osteopenia. The study included 60 women with osteopenia aged 50 - 65 complaining of chronic back pain. 30 women (experimental group - EG) held stretching, strength and equilibrium exercises, walking and folk dancing. The control group (CG - 30 women) performed 2-3 walks per week with a duration of 50 - 60min. The results after six months of observation showed reduced pain intensity and disability index, regulation of muscle balance, improved mobility of the spine, the physical and mental health status, self-evaluation health statistically more reliable for the experimental group.

Keywords: women, osteopenia, stretching, adapted physical activity, postmenopausal osteopenia, experimental group, experimental group, strength exercises, balance exercises, questionnaire SF-8™Health survey, visual analogue scale (VAS)

INTRODUCTION
Osteoporosis is a very common disease affecting millions of people across the world. It leads to disability, loss of working capacity and death, which is connected with great financial expenses for treatment and social care.

The physical activity decreases the risk of osteoporosis development, while the lack of it leads to increase of the bone resorption and reduced skeletal mass (Karlsson, 2004; Greve, 2009; Dimitrova (Димитрова), 2014).

According to Kraydjkikova (Крайджикова), 2011; Gotova (Готова), 2012a, 2012b; Miloshova, Ilinova, & Vanlyan (Милошова, Илинова, & Ванлян), 2012) back pain emerging in the spinal cord has different etiology – activation of the nociceptors by damaging muscles, muscle overexertion, external traumas, osteoporosis, static overload etc. Lumbosacral pains can be found in 75-85% of the world population. Many authors recommend different physiotherapy methods for prevention and treatment of back pain (Gencheva (Генчева), 2011; Eremiev (Еремiev), 2011; Krstev, Nikolovska, Stratoska, & Vasileva (Кръстев, Николовска, Стратоска, & Василева), 2011); Gotova, 2012; Kraydjkikova, Anandovna, Constantinou, Matzuridis, Matzuridis, 2012).

Winters-Stone (2005) recommends women with osteopenia to do exercises of medium and high intensity.

METHODS
The aim of the study is to a to establish and evaluate the effect of a motor exercise program to reduce chronic low-back pain syndrome and functional recovery of the spine in postmenopausal women with osteopenia.

Object of the study are 60 women aged 50 - 65 with reduced bone mineral density (Т-score ≤ -1,0) and chronic pains (lasting longer than 6 months) in the lumbar region, divided into two groups of 30 women – experimental (EG) and control (CG).

At the beginning and at the end of the six-month period of observation, the following was noted:
• the intensity of chronic lumbosacral pain as well as the number of its relapses a year after the beginning of the experiment;
• the increased tonus and the shortening of m. erector spinae lumbalis, m. iliopsoas, m. rectus femoris, mm. adductors femoris, mm. ischiocrurales и m. piriformis;
• static strength endurance of the body and hip (BH), body and BH extensors, left and right m. quadratus lumborum, abdominal muscles and tensors of BH, upper back muscles, lower back and gluetal muscles, (static part of the test for lumbar disk disease after Jelev et al., 2004);
• mobility of the spine - body tilt forward test of Schober, extension of the body from the starting position leg, left and side slope right body tilt (dynamic part of the test for lumbar disk disease after Jelev et al., 2004);
• disability index (Oswestry Disability Index – ODI, 1982);
• general health condition (through questionnaire.....
SF-8™ Health survey for physical and mental status); women self-evaluation of their health condition.

Women from the CG, during the whole period of the observation, perform at least 2-3 walks per week in the country, in duration of 50-60 min.

The motor program for the women of the EG includes:

- three times per week (during the day) – power training in duration of 50-60 min. which includes soft tissue mobilization of the spine cord (10-15min), strength exercises (25-30min) and stretching exercises (10-15min);
- aerobic training (twice per week) in duration of 50-55min. It is performed individually at home and includes stretching exercises (8-10min), dosed walking with small to moderate intensity on a flat surface with special stages (25-30min), breathing exercises after speed tracks (5-10min) and again stretching exercises (8-10min);
- folk dancing (twice per week) in duration of 50-60 min.

RESULTS

The results for the pain of the EG after the visual analogue scale (VAS) vary between 4 to 6 points at the first examination and from 0 to 3 at the end of the research. For the CG, at the beginning pain is moderate (4-6) points, and at the end of the experiment it varies between 1 to 5 points. The difference in the situation of the women from the two groups at the end of the observation (EG– 1,70 ± 0,17 and CG – 3,17±1,05 points) is statistically significant. Analyzing the achieved results on the pain intensity of the two groups in dynamics we established that the pain reduction of the experimental group (67,92%) is statistically significantly bigger than that of the control group (41,36%).

At the beginning of the experiment, the left m. erector spinae lumbalis, is the most shortened, followed by m. piriformis and m. iliopsoas in the left, which are the muscles most often provoking discomfort and pain in the lower part of the back. Our results confirm the studies on the relaxing effect of stretching exercises on the muscular imbalance by many other authors (Kraydjkova (Крайджикова), 2011; Gotova (Готова), 2012a; Konstandinou, 2014). At the end of the observation of the women in the two groups a statistically reliable reduction of the muscular hyper tonus was registered in the tested musculature. The final data show that a lot less of the women in CG completely recover the muscular length and the possibility of relaxing the tested muscles. The most shortened remains m. erector spinae lumbalis, followed by m. iliopsoas and mm. ischiocrurales, where a moderate shortening is observed in over 70% of the women.

Regarding the studied indication in the dynamic part of the test for lumbar disk disease, the differences between the initial values of the two groups have no statistical importance. The specialized impact of the motor program of the EG statistically and significantly improves the volume of movement in the lumbar part, more prominent for the women in that group.

Analyzing the increase of the dynamic strength endurance in percent, it can be seen that the biggest increase in the EG are demonstrated by the tensors of the body and BH (183,62 % for EG and 76,56 % for CG), followed by lower back muscles and gluteus (169,09% for EG and 65,29% for CG). The normalized physical capacity of the musculature around the spinal cord and BH and the reduced hyper tonus of the static muscles in the region, lead to optimizing the muscle balance statistically significantly more prominent about the EG.

After the experiment, the disability percentage of EG was reduced by 10,70%, and for the CG – 6.42%. The difference between the average results of ODI at the beginning and in the end of the study for both groups is statistically important. The lower degree of disability for EG proves the effect of the presented program, which decreases pain, improves the mobility of the spinal cord and the functional abilities of the musculature. The difference in the degree of disability between the two groups is the final stage of the observation (4.28% for EG) is statistically reliable.

Women for the EG show significant improvement of physical health condition. The initial grade of 25,62±5,04 points reaches 52,52±7,46, and the increase of 104,98% is statistically reliable (P(t)=100%). For the CG the result is improved for 65 points, reaching average grade of 35,21±5,66 points. Even though a lot lower increase of 37.75%, it is still statistically significant (P(t)=100%).

The differences in the mental health condition between the first and the second measurement in the CG and EG are statistically reliable (P(t)=100%). In the final examination the women form the EG had average grade 57,69±4,56 points and the CG – 50,67±9,29. The difference between them of 7,02 points is statistically significant (t=3,72 and P(t)=99,95%).

DISCUSSION AND CONCLUSIONS

Our experimental study gave interesting scientific and practical results. We tested our motor program, the results of which were compared with the control group, performing walks in the countryside 2-3 times a week in duration of 50-60 minutes. We saw good analgesic and balancing effect on muscle imbalance of the experimental program in women with osteopenia.

The analyses of the achieved results confirmed our working hypothesis that properly prepared program of adapted stretching and strength exercises, combined with dosed high intensity walks, jumps and folk dances may protect women with osteopenia of painful symptoms in the lumbosacral area, and provide them better health status and quality of life.

REFERENCES

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