Assessment of the Impact of Regular Pilates Exercises on Static Balance in Healthy Adult Women: Preliminary Report

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Abstract : Background: Maintaining the correct body balance is essential in the prevention of falls in the elderly, which is especially important for women because of postmenopausal osteoporosis and the serious consequences of falls. One of the exercise methods which is very popular among adults, and which may affect body balance in a positive way is the pilates method. The aim of the study was to evaluate the effect of regular pilates exercises on the ability to maintain body balance in static conditions in adult healthy women. Material and methods: The study group consisted of 20 healthy women attending pilates twice a week for at least 1 year. The control group consisted of 20 healthy women physically inactive. Women in the age range from 35 to 50 years old without pain in musculoskeletal system or other pain were only qualified to the groups. Body balance was assessed using MatScan VersaTek platform with Sway Analysis Module based on Matscan Clinical 6.7 software. The balance was evaluated under the following conditions: standing on both feet with eyes open, standing on both feet with eyes closed, one-leg standing (separately on the right and left foot) with eyes open. Each test lasted 30 seconds. The following parameters were calculated: estimated size of the ellipse of 95% confidence, the distance covered by the Center of Gravity (COG), the size of the maximum shift in the sagittal and frontal planes and load distribution between the left and right foot, as well as between rear- and forefoot. Results: It was found that there is significant difference between the groups in favor of the study group in the size of the confidence ellipse and maximum shifts of COG in the sagittal plane during standing on both feet, both with the eyes open and closed ($p < 0.05$). While standing on one leg both on the right and left leg, with eyes opened there was a significant difference in favor of the study group, in terms of the size of confidence ellipse, the size of the maximum shifts in the sagittal and in the frontal plane ($p < 0.05$). There were no differences between the distribution of load between the right and left foot (standing with both feet), nor between fore- and rear foot (in standing with both feet or one-leg). Conclusions: 1. Static balance in women exercising regularly by pilates method is better than in inactive women, which may in the future prevent falls and their consequences. 2. The observed differences in maintaining balance in frontal plane in one-leg standing may indicate a positive impact of pilates exercises on the ability to maintain global balance in terms of the reduced support surface. 3. Pilates method can be used as a form preventive therapy for all people who are expected to have problems with body balance in the future, for example in chronic neurological disorders or vestibular problems. 4. The results have shown that further prospective randomized research on a larger and more representative group is needed.

Keywords : balance exercises, body balance, pilates, pressure distribution, women
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