Exercising Senior Citizens' Balance and Motor Coordination

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Introduction

Physical performance is the ability to move, which enables a person to conduct his or her everyday activities. As age advances, physical performance weakens due not only to biological ageing but also due to a person's adjustment to a lower level of activity. Managing independently is made difficult by weakening agility, speed of movement, coordination, and balance. Changes in the regulation of balance, posture and movement are extremely individual. Moving in a slow and feeble manner visibly weakens motor coordination. (Salmelin 2001, 299; Spirduso 1995, 179). Falling is by far the major cause of accidental death in the aged. As many as around 41% of aged people restrict their mobility for fear of falling, which prevents exercising the balancing systems. Therefore, the fear of falling itself can increase the risk of falling. Balance exercise can be used to reduce the risk of falling and achieve savings in medical and rehabilitation costs. (Era 1997, Spirduso 1995, 168).

Methods

Forty 65–81-year-olds are carrying out guided balance and motor coordination exercise in a group for 75 minutes once a week and, as far as is possible, they independently perform guided exercises at home. The training is for a period of six months and includes initial, intermediate and final measurements. The initial measurements of the test subjects in September 2003 measured height, weight, body composition (Inbody), the Sensory Organisation Test (SOT, EquiTest), hand compression force (Newtest), the speed of a 10-metre walk using a photocell, box jumping, and the points from a functional balance test (scale 5=best – 15=weakest) and the time taken for the test. The functional balance test includes getting up from a chair – tandem walking forwards for 3 metres – turning through the right – tandem walking back – turning through the left, and sitting back in the chair. At the end of the measurements, the test subjects assessed their own balance on a scale from 0 - 10. In addition to the previous tests, the intermediate measurements in December 2003 tested the motor coordination of 29 test subjects on the Lappset motor coordination track. The final measurements for the study will be in April 2004. The measurements are fed into the SPSS application and the Pearson correlation coefficient and the Student t-test are being used as the statistical methods.

Results

After an exercise period of three months, there were no significant changes in body composition in the test group (n=40) with respect to weight, fat mass, weight index, and muscular mass. In the EquiTest SOT, the overall sway in the sway score improved between measurements by 4.3 units (t=-3.468, df=39, p=.000), the proprioseptive value by 0.5 units, the visual value by 1.5 units, and the vestibular system value by 3.0 units. Walking speed time improved by 0.12 seconds. The time taken for the functional balance test shortened by 8.9 seconds (t=5.551, df=39, p=.001) and the score obtained in the test decreased by 1.6 points (t=5.545, p=.000, df=39). Personal assessment of balance rose from 4.0 to 4.8 during the period (t=-3.375, df=38, p=.002). In intermediate measurements, 29 test subjects went through a motor coordination track on which performance time was measured. The time on the motor coordination track correlated extremely significantly with muscle mass, fat percentage, the 10-metre walk, overall sway, compression force and the performance time and points from the functional balance test. Significant correlation was found between the time on the motor coordination track and box jumping as well as personal assessment of balance.

Discussion/Conclusions

The results of the intermediate measurements are encouraging from the perspective of balance and physical performance in the aged. Balance exercise when linked with muscle fitness and motor skill exercises would appear to produce the desired result and to slow down the inevitable deterioration in the physical performance of the body. Improving confidence in mobility is witnessed by the improvement in the results in the functional balance test and in the increased speed in walking. The SOT indicates balance developed most of all in the vestibular system, the weakening of which is a large problem in the aged that results in very real problems in achieving and maintaining balance. The improvement in the personal assessment of balance among the test subjects also supports the above-mentioned results. The most surprising finding is the strong correlation in performance time on the motor coordination track between the power, balance, and functional tests. A motor coordination track with versatile and different functions and requiring motor coordination and functional balance may indeed in the future serve as a so-called test field for the characteristics in question and above all, as an exercise field where the aged can exercise and maintain their physical performance.

References

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