

Functional balance training on compliant surfaces decreases postural sway of elderly community dwelling subjects

Darja Rugelj, France Sevšek, Marija Tomšič

Faculty of Health Sciences, University of Ljubljana, Ljubljana, Slovenia

INTRODUCTION

Steadiness during standing and walking on soft carpets decreases with age and is a potential risk factor for unexpected falls in elderly subjects. Therefore we propose functional balance training that is specifically oriented to improve steadiness of centre of pressure (CoP) while standing on compliant surface (CS).

The purpose of this study was to compare the CoP sway on CS before and after treatment for a group of community dwelling elderly subjects.

METHODS

18 of subjects aged 70.5 ± 8.4 participated in a twelve week exercise program, twice per week for one hour. The exercise program was divided in two parts. The first part consisted of general group exercises for maintenance of motor control and abilities. The second part were specifically targeted functional activities where all levels of balance were emphasized. A force platform (Kistler 9286AA) was used for recordings during 60 seconds of quiet barefoot standing with feet close together. All participants were tested with their eyes opened on a firm surface (FS) and CS, which was a 7 cm thick Airex® mat.

RESULTS AND DISCUSSION

For the final analysis 15 subjects were available. In average subjects participated 19 times in the training program. In eyes open conditions on FS and on CS there was significant decrease in medio-lateral sway (in average from 0.59cm to 0.49cm $p=0.02$ and 0.99cm to 0.78cm $p<0.001$ respectively). The sway area significantly decreased only on CS in average for 4.34cm^2 ($p=0.008$). The present results indicate that specifically targeted balance exercises where subjects were encouraged to stand on smaller (such as on one leg or on the toes) supporting surface and perform variety of activities on the compliant surface resulted in decrease of medio-lateral sway and sway area in a group of highly functioning community dwelling subjects.

CONCLUSIONS

Medio-lateral sway and sway area of CoP increase with age, with specifically targeted exercise program it is possible to enhance steadiness of CoP. The most noticeable effect was on compliant surface.

Contribution for practice

This kind of training is promising for balance maintenance and its effect on fall prevention remains to be tested.