DEVELOPING A MEASUREMENT PROTOCOL FOR POSTURAL BALANCE MEASURES IN ELDERLY; PRELIMINARY DATA
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Introduction
The ability of force platform measures to predict falls remains unclear. However, certain aspects of force platform data may have predictive value for subsequent falls (1). Control of posture is also related to attention and, therefore, this parameter should be considered in testing protocols of postural control (2).

Objective
The aim of this study is to determine the influence of dual tasking on postural balance in elderly and whether these tasks can discriminate between fallers and non-fallers.

Methods
Two-legged stance postural sway was measured in 223 elderly (mean 74 ± 7.8 yrs; 40 male, 183 female) performing a postural task only and a combined postural & cognitive task. Both tasks were tested under two conditions; with and without peripheral vision (opaque goggles). An AMTI Accusway forceplate was used to measure the movement of the body centre of mass projection on the force plate. Parameters were the maximum displacement and the root-mean-square amplitude in the medial-lateral (ML, SDML) and anterior-posterior (AP, SDAP) direction from the centroid.

Intervention: Not applicable.

Results
From the total sample 42 individuals were categorised as being multiple fallers (>1 fall), 50 were one time fallers and 131 non-fallers. One-way ANOVA revealed significant differences between the test conditions with and without vision; in both the single task AP (p<0.0001), SDAP (p<0.0001), and the dual task AP (p<0.01). Repeated measurement ANOVA revealed main effects of tasks for variable AP (Pillai’s Trace = 62.5; P<0.0001) and SDAP (Pillai’s Trace = 51.4; p<0.0001). Bonferroni Post-hoc analysis showed significant differences between non-fallers and multiple fallers AP (p=0.003), SDAP (p=0.002) and between one time fallers and multiple fallers AP (p=0.041), SDAP (p=0.03).

Discussion/Conclusion
The maximum displacement of movement of the body centre of mass projection and root-mean-square amplitude in anterior-posterior direction showed significant differences between conditions. Furthermore differences between multiple fallers and non-fallers were observable. Future prospective studies should investigate the discriminative and prognostic relevance of this finding in a prospective study design in elderly fall risk populations.

References

Keywords: Balance, Elderly