Ability of different balance tests to discriminate between young and elderly subjects

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Abstract
Different balance tests are used to assess age-related decline of movement function. Good basic metric characteristics are in order for a balance test to become a usefull assessment tool for clinical and research practice. By measuring balance of 27 young (22.3 ± 3.6 years) and 23 elderly (82.3 ± 9.6 years) adults discrimination power (ROC curve) of five common and one novel balance test was assessed (maximal lunge, quick step, leaning forwards and backwards, star excursion balance test, forward reach and centre-of-pressure (CoP) tracking, respectively). In all of the tests at least one parameter had high discriminating power (ROC area > 0.8, $p < 0.05$; $d > 0.8$). CoP displacement derived parameters in the star excursion balance test had high discrimination power and had the potential to give additional information on balance, besides the outreach distance. The interaction effect between age and direction of reach or lean proved to be insignificant, with the frequency of CoP direction changes in anterior-posterior direction during star excursion balance test being the only exception. The results of this study add to the methodological ground base in clinical balance assessment protocols by identifying parameters with the highest discriminating power of the most commonly applied balance assessment tests.

Keywords:
Balance, assessment, elderly, young, fall prevention.