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Title: Interest of Locometrix compared with others clinical tests to assess gait's profile in some specific old populations

Abstract:

Introduction: Global assessment is essential in geriatric situations. Cognitive decline is associated with a larger risk of falling. Furthermore, alterations of gait appear early with cognitive decline. A new instrumental method (Locometrix°) is tested to assess gait modifications in old subjects with cognitive decline and is compared with usual clinical tests to assess the risk of falling.

Material and method: 47 patients were evaluated: 21 normal subjects (NS), 14 mild cognitive impairment patients (MCI), and 12 Alzheimer patients (AD).They were 65 years or older, living at home, had no fall or hospitalisation history in the last 6 months. They walked easily, without prosthesis, walking aid or pain.

Pull test, One leg balance and Timed get up and go were applied. Furthermore, subjects walk 40 meters with accelerometric device (Locometrix°). All procedures were realized in simple (ST) and dual task (DT).

Neuropsychological evaluation (MMSE, Mattis scale, Grober and Buschke test, Rey complex figure, divided attention test and Lawton scale) was performed to determine cognitive profiles. Petersen criteria were used.

Results: Pull test and One leg balance test do not show a difference in the three groups. Time get up and go identifies, in DT, a difference ($p < 0.05$) between AD and others. Locométrix shows that NS and AD subjects are different for speed in ST and DT, stride frequency in DT and stride length in DT with a p value <0.05. MCI are different from NS by the frequency in TS ($p < 0.05$).

Conclusion: In simple and dual task, Locometrix° identifies abnormal parameters in correlation with cognitive profile. This method is effective to detect gait abnormalities but, is not correlated with the risk of falling; nevertheless, this specific assessment seems to be an interesting method to complete the usual clinical tests in the management of patients with mobility disability.