

IMPAIRED BALANCE AND GAIT AND INCREASED RISK OF FALLING IN FEMALES WITH THE EHLERS-DANLOS SYNDROME

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Purpose: It has been mentioned that people with the Ehlers-Danlos Syndrome (EDS) experience difficulties in postural control and activities of daily living such as walking. Decrement in postural control and gait has been considered as an important factor in the incidence of falls. The aim of this study was to investigate balance, gait and risk of falling in patients with EDS hypermobility type (EDS-HT).

Materials and methods: A sample of 22 female patients with EDS-HT (mean age $40 \pm 10,6$ years) were individually gender and aged matched with a healthy control group (N=22). Each subject performed the modified Clinical Test of Sensory Interaction on Balance (mCTSIB), Tandem Stance (TS), and Unilateral Stance (US) on an Accugait force platform to assess balance by COP-based postural sway measures. The GaitRite® walkway system was used to record spatial-temporal gait variables. Each subject performed 3 walks per condition (walking single task, walking counting task, and walking tray-carrying task) at a self-selected comfortable speed. Data about fall frequency and circumstances were collected from a specific form developed for the study and fear of falling was assessed by the Falls Efficacy Scale (FES).

Results: Compared with the healthy subjects, EDS-HT subjects showed significantly impaired balance, reflected by increased sway velocity, length of sway path, medio-lateral and anterior-posterior excursion during mCTSIB and TS. Step length and stride length were significantly smaller in the EDS-HT group compared to the control group during all walking conditions and a significant dual-task-related decrease was found for gait velocity, stride velocity, step and stride length in the EDS-HT subjects. More than half of the EDS-HT patients fell at least once a month and bumped into things every day, 45,4% nearly fell or stumbled more than once a week, and a considerable fear of falling was observed.

Conclusions: This study is the first to establish that balance and gait are impaired in women affected by EDS-HT and that EDS-HT is associated with increased fall frequency and substantial fear of falling, implying a decrease in their safety of standing in everyday life situations. Future research is required to determine whether appropriate exercise programs can improve stability in this population.

Keywords: Ehlers-Danlos syndrome, hypermobility, balance, gait, fall.