

**Subjective evaluation of balance by the Dizziness Handicap Inventory does not predict fall risk in older adults visiting otolaryngology clinics**

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**Statement of grant or other support:**

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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**Word count: 2959**

**Abstract**

*Objectives:* Subjective symptoms of dizziness in older adults are affected not only by objective data such as postural balance, but also by complex psychological factors. Published data analyzing how simultaneous evaluations of both objective and subjective assessments of balance can predict fall risk remain lacking. This study examined how fall risk can be predicted based on both objective data for balance and hearing and subjective symptoms of dizziness among older adults visiting otolaryngology clinics.

*Methods:* Medical charts of 76 patients  $\geq 65$  years old with dizziness/vertigo who visited the otolaryngology clinic were reviewed. Objective data were evaluated by postural balance (posturographic data with eyes open and closed, and one-leg standing test), spontaneous nystagmus, and mean hearing levels. Subjective handicap associated with dizziness/vertigo was assessed using the Dizziness Handicap Inventory (DHI). Subjective mental status of anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS). Information on history (cardiovascular diseases) and fall accidents within the preceding year was collected using an in-house interview sheet.

*Results:* Objective data on postural balance did not correlate with subjective symptoms on DHI or HADS ( $P > 0.05$ , Pearson's correlation coefficient). Adjusted logistic regression modelling with the outcome of incident falls revealed that poor postural balance significantly predicted fall risk ( $P < 0.05$ ; 4.9 [1.4–16.8] per 10-cm<sup>2</sup> increment). Nystagmus tended to be associated with fall risk. In contrast, DHI score did not predict fall risk ( $P = 0.43$ ; 1.0 [0.9–1.03]).

Receiver operating characteristic analysis proposed a cut-off for postural sway with eyes closed  $>6.1 \text{ cm}^2$  as optimal to predict falls in patients with nystagmus (AUC, 0.74; 95% confidence interval, 0.48–0.997).

*Conclusions:* Poor postural balance is associated with increased fall risk after adjusting for subjective symptoms in older adults at otolaryngology clinics. Conversely, the self-perceived dizziness handicap of DHI score is an insufficient tool to evaluate their fall risk.

**Key words:** older adults; risk of falls; Dizziness Handicap Inventory; Hospital Anxiety and Depression Scale; posturography; spontaneous nystagmus