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Assessment of Balance During a Single-Limb Stance Task in Healthy Adults: A Cross-Sectional Study

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- [Abstract](#)
- [References](#)

Abstract

Single-limb stance (SLS) is a demanding postural task, widely used for balance assessment in both research and clinical practice. Despite extensive data on elderly and clinical populations, less is known about younger and healthier adults. Our aim in this study was to assess balance during a SLS task among a cohort of healthy adults to determine whether there are age or sex group or testing condition differences in performances. In this cross-sectional study, we involved 120 participants aged 30–65 years and divided them into four age sub-groups with equal numbers of males and females in each. We assessed balance during a 45-s SLS task on a] the Delos Postural Proprioceptive System for both lower limbs in two conditions – open eyes (OE) and closed eyes (CE). We calculated stability (SI) and autonomy (AU) indices and used analysis of variance to determine that there was no significant effect of limb dominance or sex on balance parameters. However, there was a significant interaction effect between age group and testing condition for both SI and AU ($p < .001$ for both), with balance worsening as age increased only in the CE condition. These results highlight a pattern of balance decline with age when vision is eliminated from balance performance, underscoring the critical relationship between sensory input and postural control as people age.

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