E-Poster

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Age-Related Improvement in Standing Balance Among New Walkers: A Loading Trajectory Analysis

Topic: Specific Target Groups (Children, Women, Elderly, Athletes, Musicians, Refugees, Ethnic Groups, Workers, and Others)

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BACKGROUND

Standing balance is an important developmental stage in early gait, yet its developmental process remains understudied. This study primarily investigates the relationship between age and standing balance stability using the loading measurements in new walkers, with a secondary analysis of the potential influence of neonatal asymmetrical head turning.

METHODS

We retrospectively analyzed data from new walkers who visited the motor development outpatient clinic between August 2021 and August 2024. Subjects were selected based on their initial lower limb loading test using the "Walk-way MW 1000" (Anima Corp., Tokyo, Japan). Data collected included age, sex, gestational age, birth weight, helmet therapy history for the deformational plagiocephaly / brachycephaly, head turn preference, and lower limb loading parameters (total, left, and right trajectory lengths).

RESULTS

Out of 155 new walkers with lower limb loading data, 69 were included in this analysis. The average age was 13.1 months (SD 2.9), with 42.0% female. Gestational age distribution was: full-term 66 (95.7%), and preterm 3 (4.3%). Multiple regression analysis revealed a significant negative correlation between age and lower limb loading trajectory length (coefficient = -1.575, 95% CI: -2.843 to -0.308, p = 0.016), suggesting improved standing balance stability with increasing age. In the secondary analysis of head turn preference (right: 32, left: 11, upward: 9, no preference/no helmet therapy: 14), we found no significant differences in lower limb loading parameters across different head turn preferences. Additionally, no significant differences were observed across gender, gestational age, or helmet therapy status.

CONCLUSION

Our findings demonstrate that standing balance stability improves with age in new walkers. The loading trajectory measurement may serve as a useful quantitative assessment tool for monitoring motor development.

Statement of Disclosures

None

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