E-Poster

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Kinematic Biomarkers of Limb Shortening and Compensations in Hemiparetic Gait: A Systematic Review

Topic: Biomechanics

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BACKGROUND

Hemiparetic gait is characterized by reduced limb shortening during swing, increasing the risk of tripping and leading to compensatory strategies. Despite 3D gait analysis being the gold standard for gait assessment, there is no consensus on relevant kinematic biomarkers for limb shortening and compensatory movements. This study identifies and discusses relevant biomarkers for lower limb shortening and compensatory movements during the swing phase of hemiparetic gait.

METHODS

A systematic review was conducted across five databases on March 31, 2023. Studies were included if they assessed hemiparetic adults with 3D gait analysis and reported at least one kinematic biomarker in the sagittal plane (to assess shortening) and at least one biomarker in the transversal or frontal plane or pelvis in one plane (to assess compensation). Relevant biomarkers during swing phase were selected and analyzed. Interventional studies underwent quantitative analysis to assess biomarkers with significant effect size due to the intervention. Bias assessment used JBI critical tools.

RESULTS

Three hundred eighty five biomarkers were collected from 40 studies and summarized in a Circos-plot, with 15 relevant for limb shortening, 22 for compensations and three for toe clearance. A 12-study quantitative analysis showed that biomarkers of limb shortening and compensatory movements are sensitive to change despite analytical heterogeneity.

CONCLUSION

This review highlights the heterogeneity and lack of comprehensive descriptions for limb shortening and compensations in hemiparetic gait. We propose a list of relevant kinematic biomarkers to improve descriptions of abnormal gait and to standardize data for evaluating therapeutic interventions.

Statement of Disclosures

None

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