E-Poster

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Comparison of Spatiotemporal Gait Parameters in Children Operated for Developmental Dysplasia of the Hip (DDH) and Healthy Controls

Topic: Biomechanics

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BACKGROUND

Developmental dysplasia of the hip (DDH) can result in persistent gait abnormalities due to residual biomechanical impairments, even after surgical correction. Understanding these alterations is crucial for optimizing rehabilitation and functional outcomes. This study aims to compare spatiotemporal gait parameters between children operated for DDH and age-matched healthy controls using an objective gait analysis system.

METHODS

This cross-sectional study included 10 children operated for DDH and 10 healthy controls matched by age. Gait analysis was performed using the GAITRite® walkway system, which objectively measures spatiotemporal gait parameters. Each participant completed multiple walking trials at a self-selected speed. The parameters analyzed included gait velocity, step length, stride length, cadence, single- and double-support phases, the Functional Ambulation Profile (FAP) score, and the Gait Variability Index (GVI).

RESULTS

Children with DDH had a significantly lower gait velocity compared to controls (79.1 cm/s *vs.* 108.6 cm/s, $p < 0.05$). Cadence was also reduced in the DDH group (99.0 steps/min *vs.* 121.7 steps/min, $p < 0.05$).

Step and stride lengths were shorter in the DDH group, with an average difference of 6 to 10 cm compared to controls (Mean step length: 50.7 cm *vs.* 58.2 cm, $p < 0.05$).

The double-support phase was significantly increased in children with DDH (24.1% *vs.* 18.3%, $p < 0.05$), indicating a compensatory strategy for increased stability.

The FAP score was lower in the DDH group (83.2 *vs.* 94.6, $p < 0.05$), reflecting reduced gait efficiency. The GVI was also altered, showing increased variability in step timing and spatial parameters, suggesting neuromuscular adaptations post-surgery.

DISCUSSION

These findings confirm that children operated for DDH exhibit residual gait abnormalities, characterized by slower gait speed, increased reliance on double support, and reduced locomotor stability. These results align with previous studies showing persistent gait alterations despite surgical correction.

Targeted rehabilitation strategies, focusing on gait symmetry, lower limb strength, and dynamic balance training, may help optimize functional recovery.

CONCLUSION

Children who have undergone surgical correction for DDH retain functional gait impairments, including slower speed, shorter step length, and prolonged double support time. GAITRite® analysis highlights significant differences from healthy peers, emphasizing individualized rehabilitation. Long-term follow-up studies are needed to assess gait progression and refine therapeutic interventions.

Statement of Disclosures

None

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