

TITLE

Motion of the Paediatric Foot during Gait: Associations with Obesity

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Introduction

Childhood obesity is associated with altered gait characteristics. However, little is understood about the impact of obesity on three-dimensional motion of the paediatric foot. The aim of this study was to examine the associations between foot motion over the gait cycle with obesity in 7 to 11 year boys.

Methods

Fifty five boys (mean age 9.56 ± 1.13 years) were recruited into the research. Each participant was measured for percentage body fat (%BF) by air displacement plethysmography (mean %BF $23.78 \pm 9.33\%$, range 9.57 - 42.06%). Three-dimensional foot motion during gait was measured by a 10-camera motion capture system recording retro-reflective markers attached to the foot. Principle component analyse was used to group foot motion measures at gait cycle events and peaks through the stance and swing phases. These components were then analysed for associations with %BF by multilevel linear regression (significance set at $p < 0.05$).

Results

Significant associations were found between rearfoot and midfoot motion with %BF. Participants with higher %BF demonstrated; greater rearfoot abduction throughout the gait cycle; midfoot dorsiflexion in late stance and swing; and, midfoot eversion in early stance.

Conclusion

Findings from this study support the view that obesity is associated with altered motion of the foot during gait. Data from this study suggests obese children have a pronated foot type, a possible precursor to altered function and pathology in later years. Further work is required to understand the long term impact of altered foot motion during gait associated with childhood obesity.

1. Conflict of Interest:

None Disclosed

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