

Symmetry of Plantar Pressure Distribution and Center of Pressure Excursion Index in Active Female Adolescents with Foot Pronation: Cross-Sectional Study

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Original Article

Abstract

Introduction: The purpose of the present study was to compare the symmetry of the distribution of plantar pressure and the center of pressure excursion index (CPEI) in active female adolescents with and without foot pronation disorder.

Materials and Methods: This cross-sectional study was conducted on 34 physically active female adolescents with and without foot pronation aging 14 to 17 years. The participants were included through convenient sampling. Dominant leg was determined using blindfolded fall test and Waterloo dominant leg questionnaire. Brody method and foot pressure measurement system were used to measure navicular bone position and plantar pressure distribution, respectively. Data distribution was determined by Shapiro-Wilk test and between-group comparison of parameters concerning plantar pressure distribution was conducted using independent t-test at the significance level of $\alpha \leq 0.05$.

Results: There was no significant difference in the symmetry of the distribution of plantar pressure and maximal plantar pressure between two groups ($P > 0.05$); however, among the symmetry indices of decuple maximal plantar pressure zones, the maximal pressure at first metatarsus ($P = 0.04$) and medial heel ($P = 0.05$) was significantly different between groups.

Conclusion: It seems that the symmetry at first metatarsus and medial heel was less in female adolescents with foot pronation disorders compared to that of healthy group. In addition, these girls showed higher pressures at medial heel and first metatarsus probably because of wider contact between the medial region of their foot and the ground. However, the pattern of distribution of plantar pressure and CPEI was almost the same in both groups without significant difference.

Keywords: Symmetry; Plantar pressure distribution; Center of pressure excursion index; Foot pronation; Female adolescents; Physically active

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