Editorial

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Biomechanical Evidence From Ultrasonography Supports Rigid Foot Orthoses in Children With Flatfoot

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Physiologic flatfoot is common and almost asymptomatic and flexible; however, it can be a source of pain, gait pattern change, or scoliosis [1]. The interest in the flatfoot in children has recently increased. Various management options, including medication for pain, orthoses, stretching, footwear selection, activity modification, and surgical management, have been used. Custom foot orthosis is commonly prescribed with the expectation of normal foot and leg function via arch realignment and stability increment; however, the effect is still controversial [2]. A recent study published by *Annals of Rehabilitation Medicine* demonstrated the clinical improvement in rigid foot orthoses (RFOs) in children with flatfoot [3]. To support the evidence of the effectiveness of RFO, they published new findings as follow-up studies on RFO and the changing muscle properties in this issue of the *Annals of Rehabilitation Medicine* [4].

The authors [4] investigated changes in the cross-sectional area (CSA) of the ankle invertors and evertors using ultrasonographic measurements and symptoms after 12 months of RFO application in children with symptomatic flatfoot. They explained the clinical effects of RFOs with changes in the CSA ratios of the ankle invertors and evertors and provided an interesting clinical reasoning, wherein PFO reduces the compensatory activities of the ankle invertors, thereby increasing the peroneus longus ratio and reducing pain.

Many biomechanical changes have explained the mechanism of flatfoot, including moment and joint motion changes in the lower extremity [5,6]. An imbalance between ankle invertor and evertor has been proposed as another mechanism. Although a previous study failed to reveal the strength of invertors and evertors affects flatfoot, Yalcin et al. [7] revealed that the change in the CSA of the invertor and evertor affects the clinical symptoms for the first time.

For assessment of lower limb biomechanical changes, most studies have used simple radiography and have used computed tomography or magnetic resonance imaging in some cases. Moreover, kinematic or kinetic assessment using a motion capture system, various sensors, or electromyography could provide more detailed information. However, these methods have shortcomings such as radiation-related risks or high cost and require elaborate processes and additional expertise. Therefore, ultrasonography could be a good alternative because it is a safe and painless procedure, especially for flatfoot assessment, which is common in pediatric patients [8].

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Based on this study, RFO might be recommended as a standard option for children with symptomatic flatfoot, with clinical and biomechanical evidence from ultrasonography. Moreover, physiatrists can make good use of ultrasonography, thus this type of trial could broaden the research scope in rehabilitation.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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