

ジュニアアスリートにおいて足部形態が
運動器機能およびスポーツ動作に与える影響
—新たなスポーツ傷害スクリーニングの確立に向けて—

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Foot Alignment and Musculoskeletal Function in Adolescent Athletes

by

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ABSTRACT

High incidence rate of sports-related injuries is recognized in adolescents. Although flexible flatfoot is a common foot condition in adolescent populations, the association between foot morphology and musculoskeletal function remain unclear in adolescents. Rearfoot angle in the double-limb standing position, isometric muscle strength of the knee and ankle, and morphology of the intrinsic foot muscles were measured in 39 adolescent athletes (19 boys and 20 girls) with a mean age of 13.7 years. Gait assessment during comfortable walking was investigated using plantar pressure measuring system and wearable inertial sensor. The participants were divided according

to their rearfoot angle into control (less than 7°) and valgus (greater than or equal to 7°) groups. An excessive valgus rearfoot angle was detected in 33 feet (48.5%). Although no statistical differences were observed in muscle strength of the knee, and morphology of the intrinsic foot muscles between the control and valgus groups, the valgus group demonstrated greater muscle strength in ankle dorsiflexion, higher dorsiflexion angle at heel contact. In the valgus group, the foot plantar pressure was significantly larger in hallux area, and smaller in metatarsal area and heel area. Our findings suggest that excessive rearfoot valgus affects the plantar pressure distribution and gait patterns in adolescent athletes.

要 旨

可撓性扁平足は思春期年代によくみられる足部変形である。扁平足は体幹・下肢の運動連鎖に影響して運動器疾患リスクを上昇させるが、成長期における足部形態と歩行時の足圧分布や下肢運動器機能の関連は未だ明らかでない。本研究では定期的な運動習慣を有する成長期アスリート39名78足（平均年齢13.7歳，男19名，女20名）を対象とし，足部アライメント異常の発生率，足部形態と体組成，下肢筋力，歩行時の足底圧分布と歩行動作の関連を調査した。下腿踵部軸角（LHA）7度以上の外反群は33足（42.5%），7度未満の正常群は45足であった。外反群では足関節背屈筋力と歩行時の踵接地角度が高値であり，ピーク足底圧は後足部と中足骨頭領域で低く，母趾では高値であった。成長期アスリートの足部アーチは発達段階にあるため，LHAによる足部アライメント評価が有用であり，過度の後足部外反は足関節背屈筋力，歩行時の足底圧分布と踵接地角度に影響することが示唆された。