

The morphological look of the plantar surface in the young soccer players

Simone Mantini, Antonello Ciccarelli and Maurizio Ripani

Dipartimento di Scienze della Salute, Unità di Anatomia, Università degli Studi di Roma "Foro italico", Roma, Italy

Introduction. The plantar support and its modifications are widely studied because of their bearing on posture (Eils E et al., 2004). In particular, past studies have focused on the support modification during specific athletic tasks to highlight the eventual correlations between foot type and the most frequent sport injuries, due to intrinsic and extrinsic components that involve the structural and functional dynamics that act on the plantar vault during static and dynamic condition. These studies have been conducted by analyzing the morphological variation of the footprint during the performance (Bruner E et al., in press).

Methods. In the present study the variation in shape of the baropodometrical footprint of young soccer players, has been analyzed using geometric morphometrics (Adams et al., 2004). This approach permits a quantification of the morphological variation of the subjects using Cartesian coordinates placed at specific points on the footprint outline, and to correlate them with physical variables.

Results. In the present study the young soccer players displayed a narrowing of the footprint due to a transversal variation on the isthmus, when compared to children of the same age who did not play soccer. These results suggest a physiological and biomechanical organization of the foot type in soccer due to the specific athletic tasks involved.

Discussions. As the foot type, in sport, is strictly associated to recurrent injuries, the result obtained in this study should be considered as indicative for future analysis. In fact, a clear and univocal knowledge of this phenomenon would be useful in the planning of a training protocol to reduce the incidence of sport related injuries.

References

- Adams et al. (2004) Geometric morphometrics: ten years of progress following the revolution. *Ital J Zool* 71: 5-16.
- Bruner E et al. (in press) Preliminary shape analysis of the outline of the baropodometric foot: patterns of covariation, allometry, sex and age differences, and loading variation. *J Sports Med Phys Fitness*.
- Eils E et al. (2004) Characteristic plantar pressure distribution patterns during soccer-specific movements. *Am J Sports Med* 32: 140-45.

Keywords: Geometric morphometric, soccer players, foot morphology.