Influence of educational biomechanics for correcting the plantar pressure pattern of recreational runners

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Introduction: Changes in dynamic foot loading, high or low plantar arch and shoe cushioning have been risk factors associated with many overuse injuries in lower limbs of runners1,2,3,4. Foot alignment is another important risk factor, which may alter plantar distribution pattern of the foot5. However, the literature is still a lack of evidence on educational strategies of these risk factors to change plantar pressure, especially as prevention of the risk of injury. Further studies are needed to investigate the strategies to dynamic plantar pressure change in runners based on the risk factors most associated with foot injuries. Therefore, the purpose of this study was to investigate the influence of educational biomechanics strategies for correcting the plantar pressure pattern in feet regions different of recreational runners.

Materials & Methods: Twelve recreational runners were evaluated: 24 feet total assessed (45.4±8.1 yr, 69.6±14.0 kg, 1.68±9.2 m). The plantar pressure was evaluated by pressure platform system during static posture. All runners exhibited a heel strike pattern of running. Soon after this evaluation, the runner was invited to participate in 2 lectures with biomechanical themes of the risk factors associated with lower limb injury. The first lecture is on pain and impact overload in feet and the second on foot posture and shoe types. Each lecture with 20 consecutive minutes was followed by 10 minutes for questioning with the speaker. Two weeks after the lectures, all the runners were re-evaluated. Maximal force, peak pressure and contact area were evaluated over the lateral and medial rearfoot, midfoot and forefoot. The data were processed in a custom written Matlab function. Dependent variables, pre and post lecture, were compared by paired t-test ($p<0.05$).

Results: Variables related to maximum force in midfoot was reduced post lecture (pre: 19.4±15.2; post: 15.2±11.4, p=0.04), peak pressure increased over forefoot (pre:1409.0±264.6; post:1508.2±208.2, p=0.03) and the lateral (pre:276.7±50.1; post:309.6±58.7, p=0.01) and medial (pre:287.1±53.8; post:316.9±61.5, p=0.01) rearfoot. Contact area showed no significant difference over the lateral and medial rearfoot, midfoot and forefoot (pre and post lecture).

Conclusion: The educational biomechanics lecture for correcting the plantar pressure pattern in feet regions different of recreational runners was not effective, leading to increased peak pressure on the forefoot and rearfoot (medial and lateral). These findings help to understand the need of the physiotherapist to train with exercise the better distribution of plantar load.

Biography

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