

Editorial

Barefoot Running: Is that different in the implications for running injuries?

Despite the technological developments in modern running shoes, up to 50 % of runners get an injury in a given year. The prevention in the running community is important for sports medicine practitioners. Barefoot running encourages a forefoot strike pattern that is associated with a reduction in loading impact and stride length. As running is a very popular activity, it is important to understand underlying biomechanical aspects in order to provide appropriate intervention and rehabilitation therapies to minimize the risk of injuries and improve the recovery after an injury. Many studies have shown a reduction in injuries to shod forefoot strikers as compared with rearfoot strikers. In addition, barefoot running also let the runner increased sensory feedback from ground contact, as well as increased energy storage in the arch.

One of the techniques utilized for preventing the running injuries is to modify the gait pattern, with one particular contemporary trend increasing amongst runners, i.e., barefoot running or using minimal footwear. There are many evidences to suggest that barefoot running results in changes in kinematics as well as in kinetics. For the runners, barefoot running changes the foot strike pattern from initial rearfoot contact (RFS) to striking the ground with the mid- or forefoot (FFS). This modification typically results in a decrease in the vertical impact force at contact, accompanied by kinematic changes because forefoot strikers are able to eliminate the impact through the eccentric loading of the posterior calf musculature.

Considering specifically the low back while running, there is evidence to suggest that during the loading response and stance phase, there are positional changes in the low back and pelvis. This leads to the notion that a change in initial contact, as a result of utilizing a different foot strike pattern, could change the position of the low back during running.

Injuries to structures have been linked to the propagation of shock throughout the body. The ability to attenuate shock is dependent on passive structures of the body and active

movement, and these factors can be influenced by running speed, stride length, and fatigue. Landing with a forefoot strike results in a shorter stride length, with the foot landing closer to the center of mass of the body. This reduces the moment arm of the ground reaction force to the hip and knee joints. If shock attenuation could change by running a different way, then perhaps injury and pain in the low back could change as well. A concomitant decrease in impact could potentially prevent or delay degenerative changes such as weakening of shock absorbing structures of the body, including the intervertebral discs. It could thus be suggested that FFS running could help prevent or delay such degenerative effects.

At this moment, there is significantly more that we do not know about barefoot running than we do know. In the literature, there is suggestion that, along with reducing the impact transient, being barefoot provides increased sensory input that results in greater static and dynamic stability. There is also evidence showing an improved strength in foot arch and in the ankle musculature.

There is also a paucity of studies describing injuries patterns in this population. There are many questions yet to be answered before medical professionals can make informed decisions about what to recommend to their running patients.

Running is the most natural form of exercise we have. There is some evidence that we are designed to run and we did so as part of our survival. We spend most of our history barefoot. The modern running shoes appeared in the last 50 years. We can argue that running with cushioned shoes is unnatural and may contribute to the high rate of injuries that we see today. Clearly there are biomechanical differences between running barefoot and shod rearfoot. However, the risk of injuries associated with barefoot running is still unknown. Well-controlled prospective injury studies are needed to determine whether shedding our shoes while we run is truly good for the health.

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