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Barefoot walking/running and the use of shoe inserts

A common opinion expressed by health care professionals is that if you use a cervical collar or a back brace for too long a period of time, you will become dependant on the brace and your muscles will get weak. Interestingly, this is not an opinion often heard concerning the use of shoe inserts. More often shoe inserts are dispensed with the expectation that you will need to use them the rest of your life.

When working with patients, I have often used the analogy of an eye patch and eye glasses to explain how shoe inserts are used. An eye patch is used until the eye injury is healed. Eye glasses are used forever. Sometimes, shoe inserts are needed for a brief period of time until an injury is healed. Under some circumstances, shoe inserts are prescribed to be used for the rest of the patient's life.

The challenge is: how to distinguish individuals needing a temporary shoe insert from those who need a permanent one. Additionally, if a temporary shoe insert is chosen, what is the appropriate amount of time to use the temporary shoe insert?

Barefoot Theory

There is a growing body of literature with anecdotal evidence, as well as controlled scientific studies, advocating the benefits of barefoot running. This literature has relevance to the use of shoe inserts.

The theory behind barefoot walking/running is that the nerve endings on the bottom – when stimulated cause reflex muscle contraction to avoid the irritation. Stepping on a something sharp or rough is painful – the muscles in the foot and leg contract in order to get off the irritation. This constant cycle of sensory stimulation and reflex muscle contraction is thought to improve the strength of the foot and leg muscles. Conversely, wearing a cushioned shoe and shoe inserts diminishes the ability to feel irritations from the ground and the reflex muscle contractions are diminished. Over time, the muscles weaken.

Evidence

The Tarahumara Indians in Mexico are famous for running as much as 200 miles over hilly, rocky terrain at high altitudes while wearing sandals made of pieces of rubber tires and a leather thong. Several Olympic track athletes have competed successfully up to the marathon distance while running barefoot, most notably Abebe Bikila, the Ethiopian athlete who competed in the 1960 Olympic marathon. An unknown contender in the race, he abandoned his shoes because they hurt his feet and ran barefoot over Rome's cobblestone streets. With a time of 2:15:12 Bikila not only won the race, but set a new world record.

Barefoot running forces you to run with good technique. Can you image running barefoot and striking the ground with the heel first? It hurts to think about it. Running

barefoot results in a foot strike with the ball of the foot or the entire foot strikes the ground (mid foot strike) first. Running in shoes with cushioned heels can facilitate running in a heel-toe gait pattern which is not an efficient way to run.

An interesting experiment using subjects with normal feet artificially reduced the ability to feel with their feet. This was done by numbing their feet with ice. When they were walking under experimental conditions, significant changes occurred in the foot mechanics. Changes occurred in how the pressure/stress was distributed across the foot and in the timing and amount of muscular activity.

Studies comparing running shod and walking barefoot have shown that the timing of activation of the muscles on the front of the shin changes significantly. Perhaps using shoes contributes to the development of shin pain. Shin splints are not a common injury of individuals who participate in modern dance, which is often done barefoot.

There is little research available which looks at shoe inserts and their effect on muscle strength. Research looking at shoe inserts measures mechanical factors and outcomes related to pain. Once the pain is alleviated the data collection is stopped. In order to determine the effect of long term shoe insert use, individuals need to be followed for much longer periods of time.

Questions

There is evidence to suggest barefoot walking/running has merit and should be investigated further. However the concept of barefoot walking/running is still relatively novel, and raises many questions.

Does the use of cushioned walking/running shoes over an extended period of time lead to weakening of foot muscles? Is this an escalative process that leads to the need for shoes with greater cushioning leading to the need for shoe inserts? What type of injuries could barefoot running prevent? What are the negative consequences of barefoot walking/running? Should barefoot walking/running be part of a therapeutic exercise program to be used in the rehabilitation of foot and leg injuries? Is it better to run in a shoe that feels hard as opposed to a shoe that feels “cushy”? After many years of running in shoes, how do you go about safely learning barefoot walking/running?