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The Effects of Insoles on Loading Rate in Level Running

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Int J Exerc Sci 2(1): S9, 2009. **Introduction:** Running is one of the most popular recreational sports in America with over 250 million regular runners. Recreational and competitive runners often experience over-use injuries including plantar fasciitis, Achilles tendinitis and stress fractures. Previous research has shown that the transmission of ground reaction force through the lower extremity leads to these over-use injuries; however, it is not solely the magnitude of vertical ground reaction forces, but also the rate at which these forces are applied that may lead to lower extremity injury. Many recreational runners will use over-the-counter insoles as a method of treating an injury or as a way of prolonging or renewing an old pair of running shoes. Therefore, the purpose of this study was to examine the efficacy of two insoles on peak vertical ground reaction forces and loading rates. It was hypothesized that no differences in peak vertical ground reaction forces or loading rates would exist with the addition of two insoles during running. **Methods:** Twelve subjects (7 females; 5 males) performed seven trials in each of the following conditions: no insoles, over-the-counter insoles and custom made memory-foam insoles. Over-the-counter insoles were made by Dr. Scholl's while the memory-foam insoles were made of tempur-pedic material. Ground reaction forces were recorded using a force plate (1440Hz; AMTI) while subjects ran across a 15 meter lab. Loading rate was calculated as the quotient of the peak vertical ground reaction force during load response and the time from heel strike to peak vertical ground reaction force in load response. A 2 x 3 (gender x insole) repeated measures ANOVA was used to compare the effects of insoles on loading rate. Alpha level was set at $p < 0.05$. **Results:** The current study found no statistical differences in normalized or non-normalized loading rate between the insole and no insole conditions. Furthermore, there was no effect of gender on loading rate. **Discussion and Conclusions:** The findings of the current study suggest that insoles do not attenuate shock or decrease loading rate. The lack of shock attenuation associated with the insoles suggests they are not effective in prolonging the life of a pair of running shoes by improving shock absorption. Furthermore, these data suggest that insoles will not aid in the prevention or treatment of injury in running.

