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Title

Study of military footwear comfort, selected size, and lower leg overuse injuries

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Summary

We assessed n=227 infantry soldiers for a history of overuse injury, footprint length, used shoe size, and footwear comfort. Study results showed that improper boot size was significantly related to comfort ratings but was not associated with a history of lower leg overuse injury.

Introduction/ basics

High rates of overuse musculoskeletal injuries such as plantar fasciitis and stress fractures have been observed among physically active military personnel. During service time, infantry soldiers use issued boots daily that should fit well and provide comfort to prevent injuries and decrease lower extremity pain effectively. The association of military boot comfort with overuse injuries remains unclear. This study investigates the relationship between the chosen military boot size, perceived boot comfort and lower leg overuse injury.

Material method; implementation/ process

During the cross-sectional study, 227 (males, n=213; females, n=14) active-duty infantry soldiers at a mean age of 29.5 years old, and with an average service time of 7.2 years were assessed for a history of overuse injury, footprint length, appropriate shoe size, and footwear comfort. Males with a history of overuse injury (n=32) and non-injured age-matched controls (n=34) were selected for detailed testing and establishing the possible relationship between footwear comfort and lower leg overuse injury. See Flow chart attached for the details.

Results

Footwear comfort rating was assessed for all study participants. Differences in footwear comfort rating between gender groups were independent of the previous history of overuse injury. The highest overall footwear comfort rating was 6.7 in the non-injured males group. The lowest rating of 5.2 was observed for the heel cushioning among the non-injured females group.

In total, n=66 male subjects were additionally tested to assess the relationship between footwear comfort and lower leg overuse injury. For the additionally tested group, self-selected military footwear sizes were converted to millimetres using the Mondopoint system and then compared with the footprint length measurement from the Footscan® software. As a result, 57.6% (n=38) of all study subjects daily were wearing an inappropriate shoe size: 30.3% among subjects with a history of overuse injury (n=20) and 27.3% among subjects without a history of overuse injury (n=18). Only six subjects wore bigger shoe sizes, and others (n=31) used a smaller shoe size than would be recommended according to their foot measurement. Subjects who wore the wrong shoe size in both (injured and non-injured) groups showed lower military footwear perceived comfort ratings across all dimensions.

Discussion/ conclusion; conclusion for the practice

Study results showed that inappropriate military boot size significantly affects footwear comfort ratings. History of previous lower extremity overuse injury was not related to either shoe size selection or footwear comfort ratings. Based on our study results, we recommend footprint length assessment for proper footwear size selection.

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