Sex Differences in the Response of Ankle Joint Flexibility Following Foam Rolling on the Calf

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Abstract:

Foam rolling (FR) has gained popularity as a conditioning method for improving flexibility and is widely used in sports settings. Recent meta-analyses have shown that the extent of FR-induced flexibility improvements may differ between males and females, but few studies have directly investigated these differences. This study aimed to investigate sex differences in changes in ankle flexibility following FR applied to the calf. Ten healthy males (23.4 ± 1.1 years) and ten females (23.6 ± 1.6 years) performed three 60-second sets of FR on the calf of their dominant leg. Ankle dorsiflexion range of motion (DF ROM), passive torque, and the stiffness of the gastrocnemius lateralis, gastrocnemius medialis, and soleus muscles were measured before and after FR. No significant sex differences were observed in the change rates of any measurements ($p > 0.05$). A significant positive correlation was found between DF ROM and passive torque only in females ($r = 0.805$, $p < 0.05$). No significant correlations between DF ROM and changes in muscle stiffness were found in either group ($p > 0.05$). These results suggest that there are no sex differences in FR-induced improvements in ankle flexibility, but the mechanisms for DF ROM improvements may differ by sex.

Keywords:

Foam Rolling; Sex Difference; Flexibility; Dorsiflexion range of motion; Passive Torque; Muscle Stiffness.