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Acute effects of firefighting on arterial stiffness and blood flow

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Abstract

Sudden cardiac events are responsible for 40–50% of line-of-duty firefighter fatalities, yet the exact cause of these events is unknown. Likely, combinations of thermal, physical, and mental factors impair cardiovascular function and trigger such events. Therefore, the purpose of this study was to examine the impact of firefighting activities on vascular function. Sixty-nine young (28 ± 1 years) male firefighters underwent 3 hours of firefighting activities. Carotid, aortic, and brachial blood pressures (BP), heart rate (HR), augmentation index (AIx), wave reflection timing (TR), aortic pulse wave velocity (PWV), forearm blood flow (FBF), and forearm reactive hyperemia (RH) were measured before and after firefighting activities. Paired samples *t*-tests revealed significant ($p < 0.05$) increases in aortic diastolic BP, HR, AIx, PWV, RH, and FBF, and significant decreases in brachial and aortic pulse pressure and TR following firefighting activities. In conclusion, these results suggest that 3 hours of firefighting activities increase both arterial stiffness and vasodilation.

Keywords

arterial stiffness; blood flow; firefighting; vitamin C