

# EFFECT OF LIVE-FIRE TRAINING DRILLS ON FIREFIGHTERS' PLATELET NUMBER AND FUNCTION

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## ABSTRACT

**Background.** The leading cause of line-of-duty death among firefighters is sudden cardiac events. Platelets play a critical role in the formation of an occlusive thrombus during an ischemic event. **Objective.** The purpose of this study was to examine the acute effect of firefighting on platelet number and aggregability. **Methods.** Apparently healthy male firefighters ( $N = 114$ ; age  $29.4 \pm 7.8$  years) participated in 18 minutes of simulated firefighting activity in a training structure that contained live fires. Blood samples were obtained before and after simulated firefighting activity and analyzed for complete blood cell count (CBC), chemistry, and platelet number and function. Platelet function was measured using a PFA-100 analyzer to assess platelet aggregability. **Results.** As expected, performing firefighting activity resulted in significant increases in heart rate ( $75 \text{ b} \cdot \text{min}^{-1}$ ) and core temperature ( $0.7^\circ\text{C}$ ), and significant changes in blood chemistry values. The most important finding in this study is that 18 minutes of simulated firefighting caused a 24% increase in platelet number and a significant increase in platelet aggregability. **Conclusions.** Firefighting resulted in a significant increase in platelet number and aggregability, indicating that even short bouts of firefighting can increase thrombotic potential in apparently healthy firefighters. **Key words:** thrombosis; platelet count; platelet function test; platelet aggregation; firefighter