

H83 The Sudden Death of a Firefighter: A Look at On-Duty Coronary Heart Disease Fatalities

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Learning Overview: After attending this presentation, attendees will better understand the interaction of personal and work-related factors in precipitating on-duty coronary heart disease fatalities in firefighters.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by raising awareness of the prevalence of sudden cardiac death in the United States Fire Service and of the importance of adhering to the Firefighter Autopsy Protocol established by the United States Fire Administration.

Firefighting has been described as one of the nation's most hazardous occupations, as firefighters are subjected to many uncommon workplace stressors.¹ According to the National Fire Protection Association (NFPA), 4,593 firefighters have lost their lives while on duty in the United States since 1977.² People outside of fire service mistakenly assume that the majority of on-duty deaths result from burns or smoke inhalation; however, in the United States, the leading cause of line-of-duty fatality is sudden cardiac death, with cardiovascular disease accounting for approximately 45% of all firefighter duty deaths.¹⁻⁶ In contrast, such events account for 22% of deaths among police officers on duty, 11% of deaths among on-duty emergency medical services workers, and 15% of all deaths that occur on the job.²

Various explanations for the increased mortality from cardiovascular events among firefighters have been proposed, but it is ultimately thought to be from a combination of personal and work-related factors.^{3,5} Personal factors associated with the development of heart disease are well known and include age, gender, family history, smoking history, and lack of exercise.⁵ Not as widely known, however, are the ways in which specific firefighting duties can lead to, and even trigger, coronary events.^{3,5} Therefore, whether these deaths are truly precipitated by the job and, if so, from which duties, remains an important area of concern.³ Determining the cause of death of firefighters via autopsy has significant implications in providing improved understanding of fire scene hazards and the effectiveness of firefighting equipment.¹ It is for this reason that the Firefighter Autopsy Protocol was established by the United States Fire Administration.¹ It is important for those involved in death investigation to become familiar with these protocols so as to better assist in improving the health and safety of future firefighters.

A 44-year-old female firefighter with a past medical history of familial hypercholesterolemia, hyperlipidemia, major depressive disorder, and laparoscopic total hysterectomy went into cardiac arrest in front of co-workers while on the job. Earlier that morning, she completed annual physical ability testing and subsequently responded to two emergency calls. Upon returning to the fire station, she complained of severe chest pain and collapsed. She was transported to a local hospital, but resuscitation efforts were unsuccessful. In the emergency room, she was diagnosed with non-ST elevation myocardial ischemia.

Autopsy findings were significant for a complete blockage of the left anterior descending coronary artery in its proximal segment. The remainder of the autopsy was essentially unremarkable. Toxicological analysis revealed the presence of her psychiatric medications and an antihistamine, all of which showed concentrations within therapeutic limits. Vitreous electrolyte studies were non-contributory. Her cause of death was certified as "Occlusive coronary artery disease due to atherosclerotic cardiovascular disease." The manner of death was certified as natural.

Given the team dynamics associated with being a firefighter, on-duty adverse health events can jeopardize job performance and the safety of co-workers.⁶ These events also have the potential of compromising public safety and impose significant economic burden on fire departments and local communities.⁶ Because of this, it is important to understand the interaction of potential firefighting-related triggers of sudden cardiac death with underlying heart disease prevalent among firefighters.⁶ With over one million firefighters currently working in the United States, this knowledge is important for reducing the incidence of cardiovascular events, which is of major importance to fire departments, the medical community, and society as a whole.⁶

Reference(s):

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Firefighters, On-Duty Death, Firefighter Autopsy Protocol