

Autonomic Nervous System Balance of Firefighters Across a 24-hour Shift

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Abstract:

Shift work is understood as work outside of typical daytime hours, and is known to have adverse health effects such as fatigue and increased risk for obesity, cancer, and diabetes. Firefighters are at a known increased risk for cardiovascular disease (CVD) through their intense physical work and exposure to high-stress situations. Heart rate variability is a way to measure autonomic nervous system balance and understand physiological stress with continuous monitoring. The purpose of this study was to evaluate autonomic nervous system balance in firefighters during a 24-hour shift in firefighters and better understand physiological changes that occur while at work. Firefighters from Hanover Park, IL wore a Zephyr biomodule for the entirety of their 24-hour shift, and were asked to fill out the Stanford Sleepiness Scale at three time points during the day (coming on-shift, 3 pm, coming off-shift). There was a significant time effect for all variables when compared to coming on shift. The data showed that firefighters came off shift expressing greater parasympathetic tone than when they came on shift. In addition, heart rate was significantly lower during sleep and going off shift when compared to coming on shift. Lastly, older and more experienced firefighters had lower heart rates and greater heart rate variability than younger firefighters.