VASCULAR CHANGES FOLLOWING EXERCISE-INDUCED HYPERTHERMIA

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The combination of hyperthermia and heavy exercise/exertion encountered during firefighting may impair vascular function, increasing risk of sudden cardiac events. **Purpose**: To isolate the effect of exercise-induced hyperthermia on arterial stiffness and coronary perfusion. **Methods**: Vascular measures were collected in 12 healthy men (age 22 ± 3yr; BMI 24.6 ± 2.8kg·m^{-2}; VO$_2$max 60.3 ± 4.44mL·kg^{-1}·min^{-1}) pre and post 100-minutes of intermittent exercise (3 bouts) in 2 randomized conditions: hyperthermic (HYT; wearing personal protective equipment), and normothermic (NOT; wearing a cooling shirt and weight equivalent to PPE). **Results**: Hyperthermic mean core temperature was significantly higher than NOT during the third exercise bout (peak 37.82 ± 0.22 vs 37.21 ± 0.40 °C) and into recovery ($p<0.05$). Measures related to coronary perfusion (subendocardial viability ratio, backwards wave pressure) were significantly lower for HYT-Post compared to other times/conditions (Table 1; $p<0.05$). No significant changes were found in arterial stiffness (forward wave pressure or pulse wave velocity). **Conclusion**: Exercise-induced hyperthermia reduces indices of coronary perfusion without affecting arterial stiffness.

Table 1: Vascular and hemodynamic variables pre and post exercise (mean ± SE; N=12)

	NOT-Pre	NOT-Post	HYT-Pre	HYT-Post
Subendocardial viability ratio	208 ± 9	232 ± 13	200 ± 9	150 ± 11*
Forward pressure wave (mmHg)	33 ± 2	33 ± 2	33 ± 2	33 ± 2
Backwards pressure wave (mmHg)	16 ± 1	16 ± 11	16 ± 11	11 ± 1*
Pulse wave velocity (m·s^{-1})	4.9 ± 0.1	4.9 ± 0.2	5.0 ± 0.1	4.9 ± 0.1

* HYT-Post < NOT-Pre, NOT-Post, HYT-Pre ($p<0.05$)