

Clinical Investigation

1. Physiologic Effects of the TASER After Exercise

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A related commentary appears on page 771.

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KEYWORDS

conductive energy devices • police • cardiac • physical restraint

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ABSTRACT

Objectives: Incidents of sudden death following TASER exposure are poorly studied, and substantive links between TASER exposure and sudden death are minimal. The authors studied the effects of a single TASER exposure on markers of physiologic stress in humans.

Methods: This prospective, controlled study evaluated the effects of a TASER exposure on healthy police volunteers after vigorous exercise, compared to a subsequent, identical exercise session that was not followed by TASER exposure. Subjects exercised to 85% of predicted heart rate (HR) on an ergometer and then were given a standard 5-second TASER activation. Measures before and for 60 minutes after the TASER activation included minute ventilation, tidal volume, respiratory rate, end-tidal pCO₂, oxygen saturation, HR, blood pressure (systolic BP/diastolic BP), 12-lead electrocardiogram, and arterialized blood for pH, pO₂, pCO₂, and

lactate. Each subject repeated the exercise and data collection session on a subsequent data, without TASER activation. Data were analyzed using paired Student's t-tests with differences and 95% confidence intervals (CIs). Statistical significance was adjusted for multiple comparisons.

Results: A total of 25 officers (21 men and 4 women) completed both portions of the study. After adjusting for multiple comparisons, the TASER group was significantly higher for systolic BP at baseline (difference of 14.1, 95% CI = 8.7 to 19.5, $p < 0.001$) and HR at 5, 30, and 60 minutes with the largest difference at 30 minutes (difference of 7.0, 95% CI = 2.5 to 11.5, $p = 0.004$). There were no other significant differences between the two groups in any other measure at any time.

Conclusions: A 5-second exposure of a TASER following vigorous exercise to healthy law enforcement personnel does not result in clinically significant changes in ventilatory or blood parameters of physiologic stress.

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