Hennepin County Medical Center

The Neuro-Endocrine Effects of the TASER X26 Conducted Electrical Weapon

Donald M. Dawes, MD[1,2] • Jeffrey D. Ho, MD[3,4] • James R. Miner, MD[3]

[1]Dept. of Emergency Medicine, Lompoc Valley Medical Center, Lompac, CA
[2]Santa Barbara Police Department, Santa Barbara, CA
[3]Dept. of Emergency Medicine, Hennepin County Medical Center, Minneapolis, MN
[4]Meeker County Sheriff's Office, Litchfield, MN

Introduction

This is the first study to examine the human stress response to a conducted electrical weapon (CEW), oleoresin capsicum, a cold-water tank immersion, and a 60-second defensive tactic drill.

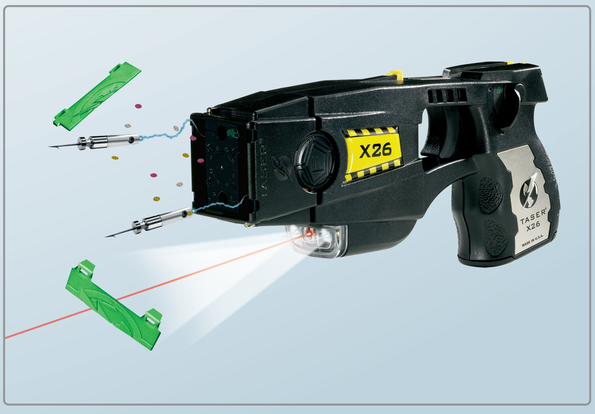
Methods

Subjects received either a five-second exposure from the TASER® X26™ CEW with the probes fired into the back from seven-feet, a five-second spray of Oleoresin Capsicum (OC), a skin and mucous membrane irritant, to the eyes. A 45 second exposure of the hand and forearm in a 0° C cold water tank, or a 60-second defensive tactics drill.

Results

The 60-second defensive tactics drill resulted in the greatest change in salivary alpha-amylase at 10 - 15 minutes with a change of 63.8 U/mL. OC resulted in a change of 37.4 U/mL. The CEW and cold-water tank immersion did not appear particularly activating to salivary alpha-amylase.

The five-second OC had the greatest change in salivary cortisol at 15 - 20 minutes with a change of 0.5 mcg/dL. The CEW resulted in lower levels with a change of 0.38 mcg/dL, and the defensive tactics drill resulted in a change of 0.25 mcg/dL. The defensive tactics drill had the greatest delayed change from baseline in cortisol with a change of 0.47 mcg/dL. The cold-water tank immersion did not appear particularly activating to salivary cortisol.



Conclusions

Our preliminary data suggests that 60-seconds of physical exertion during custodial arrest may be most activating of the human stress response compared to CEW and OC.