

Introduction

Electronic Control Devices (ECDs) are used by law enforcement to control resisting suspects. There has been controversy in the press because these devices have been temporally associated with some sudden in-custody deaths. This is the first study to examine the effects of multiple, simultaneous device discharges in humans.

Methods

Human volunteers were exposed to multiple (2-3), simultaneous five-second discharges from an ECD. Applications were to the chest, back, chest-abdomen and thighs.

Blood was analyzed before and 24-hours after discharge for Troponin I. ECGs before and after discharge were recorded, and echocardiography was used in a subset of subjects to determine the rhythm during discharge.

A blinded cardiologist interpreted the ECGs. Echocardiograms were read real-time by an emergency physician expert in ultrasonography.



Results

There were 16 subject enrolled, Troponin was always within the reference range. The electrocardiogram changes only reflected an increase in vagal tone.

In four of the six subjects who had echocardiograms performed, the echocardiographer was able to determine that the rhythm during discharge was sinus. One of the indeterminate subjects had a heart rate during the exposure of 79, not suggesting electrical capture.



Conclusion

Five-second, multiple (2-3) simultaneous exposures to an ECD device do not appear to have significant deleterious effects on the heart.