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## Repeated Thoracic Discharges From a Stun Device.

### Original Articles

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#### Abstract:

**Background:** Little objective laboratory data are available describing the physiologic effects of stun guns or electromuscular incapacitation (EMI) devices, but increasing morbidity and even deaths are associated with their use. We hypothesized that exposure to EMI discharges in a model animal system would induce clinically significant acidosis and cardiac arrhythmia.

**Methods:** Ten Yucatan mini-pigs, six experimental and four sham controls, were anesthetized with ketamine, xylazine, and glycopyrrolate. Experimental pigs were exposed to two 40-second discharges from an EMI device over the left thorax. Electrocardiograms, troponin I, blood gases, and lactate levels were obtained pre-exposure, at 5, 15, 30, 60 minutes, and at 24, 48, and 72 hours postdischarge.

**Results:** No acute or delayed cardiac arrhythmias were seen. Heart rate was not affected significantly ( $p > 0.05$ ). A subclinical increase in troponin I was seen at 24 hours postdischarge ( $0.040 \pm 0.030$  ng/mL,  $p > 0.05$ ). Central venous blood pH ( $7.432 \pm 0.014$ ) and pCO<sub>2</sub> ( $36.1 \pm 0.9$  mm Hg) were not changed significantly ( $p > 0.05$ ) during the 60-minute postdischarge period. A moderate significant increase in lactate occurred in the 5-minute postdischarge group ( $4.9 \pm 0.3$  mmol/L,  $p = 0.0179$ ). All blood chemistry and vital signs were normal at 24, 48, and 72 hours postdischarge.

**Conclusions:** Although significant changes in some parameters were seen, these changes were small and of little clinical significance. Lengthy EMI exposures did not cause extreme acidosis or cardiac arrhythmias. These findings may differ from those seen with other EMI devices because of the unique MK63 waveform characteristics or to specific characteristics of the model systems.

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