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Adoption of stun guns spikes the risk of in-custody death in the first year

January 30, 2009 | [Michael O'Riordan](#)

San Francisco, CA - The rate of in-custody sudden death increases more than sixfold in the first year after the adoption of electrical stun guns in police and sheriff departments, a new study has shown [1]. Moreover, in this first year, the use of the stun guns, the most popular of which is Taser (Taser International, Scottsdale, AZ) did not reduce the rate of firearm-related deaths, despite the devices being marketed as an alternative for reducing the use of lethal force.

"We speculate that early liberal use of Tasers may have contributed to these findings, possibly escalating some confrontations to the point where firearms were necessary," write **Dr Byron Lee** (University of California, San Francisco) and colleagues in a report published online January 21, 2009 in the *American Journal of Cardiology*.

The subsequent decrease in sudden deaths and firearm-related deaths to levels before the adoption of the stun guns likely reflects the recognition of the adverse consequences of the Taser, according to researchers, leading to an adjustment of their use or changes in techniques.

"These deaths come back to baseline in the years two to five," senior investigator **Dr Zian Tseng** (University of California, San Francisco) told *heartwire*. "That finding is supportive of the fact that the Taser might be causing excess mortality in the first year. As police learn to use the weapon, as they start to recognize that there might adverse outcomes with the gun, they would no doubt adjust their techniques or change their policies. It suggests that this excess mortality is preventable."

Commenting on the study for *heartwire*, **Dr Hugh Calkins** (Johns Hopkins University School of Medicine, Baltimore, MD) said the use of stun guns in the law-enforcement community is an important issue, one that needs to be studied further. However, he is critical of the conclusions reached by Lee and colleagues, stating that more than 13 000 police departments worldwide are using the technology, and many of these departments independently tested their safety and effectiveness.

"If you look at the Taser device in particular, it's been about 10 years since it was first introduced, and in those 10 years, it's been subject to intense and critical scrutiny by every law-enforcement body that adopts it," he said. "If this were really causing people to die, if it were not having a favorable impact, it wouldn't be so widely adopted."

Taser use in California

Electrical stun guns, also known as neuromuscular incapacitating devices, are controversial alternatives for subduing prisoners and suspects in police custody. Existing data, the researchers note, are inconclusive on the cardiac and physiologic effects of stun guns. Those with concerns about their use, including **Amnesty International**, say that the devices could cause ventricular tachyarrhythmias in real-world conditions where police suspects may be under heightened physiological, pharmacological, and environmental stress.

In an attempt to gain a better understanding of the safety of devices in the real world, the researchers surveyed 126 police and sheriff departments in California cities, of which only 50 replied with sufficient data on the rates of death before and after the adoption of stun guns. They requested information on the rates of in-custody deaths in the absence of lethal force, firearm-related deaths, and officer injuries requiring emergency-department visits. Annual arrest data per city was obtained from the California Department of Justice.

The researchers obtained data for the five years prior to deployment of Tasers and in the following five years in which they were used. In the first year after Tasers were introduced to the departments, the risk of in-custody sudden death was 5.96 per 100 000 arrests, a sixfold increase over the five years prior, when Tasers weren't used. In years two to five after deployment, however, the in-custody death rate declined to 1.44 per 100 000 arrests, a number that was not significantly different when compared with the predeployment period.

Among 37 departments that provided sufficient data, the rate of firearm-related deaths increased from 6.66 per 100 000 arrests in the years before Tasers were used to 14.1 per 100 000 arrests in the first year of deployment. This rate declined to 9.1 per 100 000 between years two and five, a rate not statistically different from rates observed in the five-year period before Tasers were used.

"Based on this study, further epidemiologic research on the effect of Taser deployment on real-world outcomes is warranted," write the researchers. "Transparency by law enforcement agencies with regard to Taser use and in-custody sudden-death outcomes is critical for future studies by independent investigators."

Lee, who has provided expert medical testimony in two legal cases against Taser, told *heartwire* that he was surprised by the findings and that he had initially thought the group was likely to publish a negative paper, especially since in-custody deaths predate the use of electrical stun guns. Tseng added that the study was not designed to answer the question of whether the Taser causes death but rather to look at what happens when it is introduced in a real-world setting.

Safer than other weapons

Calkins, who serves on the medical advisory board of Taser International, noted that only 50 departments of the 126 surveyed provided data on in-custody deaths, and only 40 of these departments provided data in the first year after the Taser was deployed. The absence of responses in this first year of deployment—there were data from 47 departments in the year prior to deployment and 50 responses in year two—could have skewed the findings to show an increase in in-custody deaths. The survey also did not determine whether the Taser had been deployed in subjects who died. Other cities, including Cincinnati, OH, and Phoenix, AZ, have used the Taser and shown that it decreases the use of lethal-force deaths and reduces officer and suspect injuries without increasing the risk of in-custody deaths, said Calkins.

Dr Jared Strote (University of Washington Medical Center, Seattle), who was not part of the study, told *heartwire* that the findings by Lee et al were interesting but, like Calkins, pointed out the study was observational in nature and hindered by missing data. Along with **Dr H Range Hutson** (Harvard Medical School, Boston, MA), he has recently studied the use of Tasers over five years with Seattle police department and found no deaths within the first 24 hours of Taser use and a low number of injuries.

"In general, I think they are a safer weapon than many of the other weapons police officers have, and in many circumstances they have the potential to save suspects' and bystanders' lives, as well as the lives of

police officers," said Strote. "But I think there are certainly some individuals who are being restrained for whom safety of Tasers is really unclear."

Strote added that the jury is still out on the physiological impact of the Taser.

Calkins told **heartwire** that there have been approximately 300 in-custody deaths with 650 000 applications of the Taser, but the time sequence of these deaths is not consistent with a ventricular arrhythmia during all of these deaths. Patients who die as a result of ventricular fibrillation caused by the Taser would die within the first minute, and not several hours later in custody, as is often the case, he said. A recent US **Department of Justice**-sponsored study of more than 1200 subjects who were Tasered found the weapon to be safe, with just three subjects reporting significant injuries [2]. Two subjects died in police custody, but the stun gun was not deemed by medical examiners to be cause or contribute to the death.

Calkins serves on the medical advisory board of Taser International and is compensated for his work. Lee has provided expert medical testimony on behalf of the plaintiffs in two lawsuits filed against Taser and received compensation for his work. Tseng and Strote report no conflicts of interest.

Sources

1. Lee BK, Vittinghoff E, Whiteman D, et al. Relation of Taser (electrical stun gun) deployment to increase in in-custody sudden deaths. *Am J Cardiol* 2009; DOI: 10.1016/j.amjcard.2008.11.046. Available at: <http://www.ajconline.org>.
2. Bozeman WP, Hauda WE 2nd, Heck JJ, et al. Safety and injury profile of conducted electrical weapons used by law enforcement officers against criminal suspects. *Ann Emerg Med* 2009; DOI:10.1016/j.annemergmed.2008.11.021. Available at: <http://www.annemergmed.com>.



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