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An Open Letter to the Law Enforcement Community

As members of the Scientific and Medical Advisory Board for TASER International, we have been asked to review a recent medical case report documented in a letter published in the New England Journal of Medicine. In this report, the authors discuss a recent incident in Chicago involving a young man involved in a confrontation with police. Following the confrontation, the youth experienced a medical crisis which later included ventricular fibrillation – a potentially lethal heart arrhythmia.¹

We are concerned that the absence of details, particularly the time course of events, leaves the reader to assume that the ventricular fibrillation occurred as a direct result of the application of the TASER device. The actual details are reportedly much more complex than what was originally printed and we object to the implication that the TASER caused a cardiac arrest in this individual.

Time Course and Medical Analysis

First and foremost, the time course in Drs. Kim and Franklin's letter is not specific. We have learned from EMS reports and the time stamped record from the TASER device which was downloaded by the Chicago police department, there was a period of 14 minutes that lapsed between the time of TASER application and the time when the subject collapsed in a medical crisis. Further, there was a period of 23 minutes from the TASER application until the ventricular fibrillation indicated in the report. Paramedics on the scene reported the subject was awake and responsive and had normal pulse and lung sounds immediately after the TASER application. He was handcuffed, transported down three flights of stairs, and placed in an ambulance during the interval before he entered a medical crisis in the ambulance. This is not consistent with an electrically induced fatal arrhythmia which should occur instantaneously.

Second, it is imperative to note that the subject involved in this case exhibited many classic features of an excited delirium condition for an extended period of time prior to collapse. These features are well described in the literature and include extreme agitation (often noted as delirious or incoherent behavior), exceptional strength, hyperthermia (often noted as sweating and/or inappropriate public disrobement), including disrobing outdoors during a cold Chicago winter day, and inappropriate hostility.² This condition is closely associated with profound metabolic acidosis.³ If left unchecked, it is known that profound acidosis will lead to rhythm disorders and subsequent cardiac collapse.^{3, 4} Additionally, it has been reported that the subject in this case had a history of medical issues which are known to be associated with excited delirium conditions^{5, 6} and is believed to have been on a medication known to have pro-arrhythmic side effects (specifics of these conditions and medications were not released due to HIPPA regulations).

The rhythm strip shown in Drs. Kim and Franklin's letter does indeed show an apparent successful defibrillation.¹ What should have been made clear, however, was the fact that this strip was recorded approximately 23 minutes after TASER application and 9 minutes into the resuscitation attempt after 3 previous shocks. The initial medical problem cannot be diagnosed from the data provided. In fact, the EMS record notes an idioventricular (pulseless) rhythm, which may have been the cause of the initial collapse. This clearly calls into question the association

between TASER application and the ventricular fibrillation rhythm. Idioventricular pulseless rhythms are common hallmarks of metabolic acidosis.³ Of further interest, it is not uncommon for first responders to apply defibrillation shocks in attempts to resuscitate a subject experiencing non-fibrillation type arrhythmias – thereby shocking the subject into fibrillation. This remains a distinct possibility in this case, although it cannot be known until the recordings of the ECG strips from the initial shock are made available. The EMS responders in this case should be commended for a successful rescue, as it is difficult to resuscitate someone from a pulseless metabolic situation, which are fatal in approximately 95% of cases.

Finally, it is important to note that fibrillation resulting from electric shocks is generally treated successfully and expeditiously with one or two shocks from an external defibrillator without complication. The protracted resuscitation in this case involved four shocks over nine minutes in concert with aggressive pharmacologic therapy. The fact pattern seems more consistent with more complex biochemical processes such as those associated with metabolic acidosis.

Conclusions and Implications for Law Enforcement

In conclusion, upon a more complete review of the available facts, it appears that this case is highly likely to be due to an excited delirium condition and resultant metabolic acidosis. The totality of information available at this time does not support a time course consistent with electrically induced ventricular fibrillation, and the author's suggestion that police agencies deploy defibrillators in conjunction with TASER device use is not supported.

From a layman's perspective, one could argue that the suggestion that police only use TASER devices when a defibrillator is present is comparable to the suggestion that police should only use physical force when a trauma surgeon is present. The flaw in this argument is that physical force has been shown to cause significant trauma in some cases. The presently available data on TASER devices indicate a significant margin of safety from causing ventricular fibrillation when used against human sized subjects – and the present case does not appear to contraindicate this safety margin as the health crisis seems more closely related to events other than the TASER application as outlined above.

In our experience reviewing the data related to TASER device usage, we believe the use of the TASER carries a much lower risk of injury or death than virtually any other use-of-force method available. Unnecessary restriction of TASER usage as outlined recklessly in the original letter to NEJ would leave police officers no choice but to use more inherently injurious and dangerous force options, thereby resulting in more unnecessary injuries and loss of life.

Respectfully submitted,



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¹ Kim PJ and WH Franklin. Ventricular fibrillation after stun-gun discharge. *NEJM*, 2005;353:958-959.

² Morrison A and D Sadler. Death of a psychiatric patient during physical restraint. Excited delirium – a case report. *Med Sci Law*, 2001;41:46-50.

³ Hick JL, SW Smith and MT Lynch. Metabolic acidosis in restraint-associated cardiac arrest: a case series. *Acad Emerg Med*, 1999;6:239-243.

⁴ Gerst PH, WH Fleming and JR Malm. A quantitative evaluation of the effects of acidosis and alkalosis upon the ventricular fibrillation threshold. *Surgery*, 1966;59:1050-1060.

⁵ Pollanen MS, et al. Unexpected death related to restraint for excited delirium: a retrospective study of deaths in police custody and in the community. *CMAJ*, 1998;158:1603-1607.

⁶ O'Halloran RL and JG Frank. Asphyxia death during prone restraint revisited: a report of 21 cases. *Am J Forensic Med Pathol*, 2000;21:39-52.