



special article

Psychiatric Bulletin (2007), 31, 391–393. doi: 10.1192/pb.bp.106.014175

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Health professionals and the monitoring of Taser use

Although electromuscular incapacitation devices (Tasers or 'stun guns') have been in use for over a decade, concern about potential health effects has not been resolved. Moreover, public policy decisions have expanded the availability of Tasers and require wide consultation with the health sector as well as other stakeholders. In the past 5 years sales of Tasers have grown considerably, with numbers of US law enforcement agencies using the devices growing from 1700 in 2001 to 8700 in 2005 (US Department of Justice, personal communication). Jenkinson *et al* (2006) recently argued, as have the UK Police Federation, that Tasers should be issued to all front line British police, a move that would see a considerable proliferation of Tasers in the UK. A current trial in four districts may pave the way for Tasers to be used nationwide in New Zealand (New Zealand Police, 2006). These developments make it imperative that health professionals monitor the physical and mental health implications of Tasers, and ensure health considerations are part of the public policy debate on their deployment. In this paper we review the existing literature on the use of Tasers, and note that the psychological effects of Taser use have not been investigated.

The currently used model of Tasers, the X26, is a battery-operated unit resembling a hand gun that fires two barbed electrodes on copper wires of up to 35 feet, at 180ft/s (Taser International, 2005). The barbs embed themselves in the victim's skin or clothes and deliver up to 50 000 volts of electricity with 1.76 J of energy in rapid pulses over a period of 5 s, causing uncontrollable muscle contraction and overwhelming pain (Taser International, 2005). Repeated charges of electricity can be administered. Tasers are used for law enforcement in the USA, Canada, Australia and the UK, and were recently introduced for a 12-month trial in New Zealand. Despite reports of concerns about their potential health implications (Bleetman *et al*, 2004; Rappert, 2004a; Bozeman & Winslow, 2005) there is little published scientific research into their effects on physical or mental health. The small body of research into Taser safety suggests that the devices are safe in healthy individuals with no predisposing risks, but is cautious about their use in some at-risk groups. Because mental health consumers may fall into one or more risk categories, any use of Tasers with that group requires a high level of vigilance.

Method

We searched the online databases Web of Science, Medline, CINAHL, PsychINFO and EMBASE. Search terms included Taser, stun gun, electromuscular incapacitation device, neuromuscular incapacitation device, non-lethal weapons AND conducted electrical weapon. In addition, we searched reference lists and relevant websites. The final source of reports was the publications list on the site of Taser International (<http://www2.taser.com>).

Results

The medical literature contains just one published review (Jenkinson *et al*, 2006). Other peer-reviewed literature includes case reports, discussion papers and experimental studies (Bleetman *et al*, 2004; Rappert, 2004a; Bozeman & Winslow, 2005; Dobrowalski & Moore, 2005; Ng & Chehade, 2005; Chen *et al*, 2006). We located numerous unpublished police reports and reviews as well as a number of discussion documents. In this report we refer to peer-reviewed publications and those unpublished documents that contain data not found in the peer-reviewed literature.

Deaths following Taser use

Amnesty International report that between 2001 and February 2006 Tasers were associated with 152 deaths in the USA and Canada (Amnesty International, 2006). A 2005 briefing paper from the US National Institute of Justice puts the figure at 184 (US Department of Justice, personal communication). Numbers of deaths have increased with the increasing availability of Tasers to police. Although the available evidence does not allow for a causal link to be established, there is sufficient concern about the possible contribution of Tasers to deaths for the manufacturer's product warnings to advise caution in groups considered vulnerable (Taser International, 2006). These groups include people with a known history of cardiac arrhythmia, those who are intoxicated on alcohol or stimulant drugs, those who are highly agitated (sometimes referred to as 'excited delirium'), those with mental illness and pregnant women (Bleetman *et al*, 2004; Rappert, 2004a; Bozeman & Winslow, 2005; Taser

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International, 2006; International Association of Chiefs of Police, 2007). Several reports suggest that agitation, drug use, predisposing cardiac problems or restraint technique may explain deaths following Taser use (Erwin & Philibert, 2006; McBride & Tedder, 2006; International Association of Chiefs of Police, 2007; US Department of Justice, personal communication).

In New Zealand, concerns about Taser deployment are compounded by the police identifying people in mental health emergencies as one of the groups who may be subject to Taser response (New Zealand Police, 2006). Among the 184 deaths discussed in the National Institute of Justice briefing paper, 19% were of people with mental illness (US Department of Justice, personal communication). In the USA, police use of Tasers has extended to in-patient mental health services (Erwin & Philibert, 2006). In the small amount of literature available there are no reports on the effects of Taser use on mental health, or on the effects of the device on people with mental illness.

A common theme throughout much of the law enforcement and medical literature is that deaths following Taser use involve multiple factors. All incidents involve individuals who show some degree of agitation (an indication for Taser use). Taser operational protocols often include warnings in cases where persons have been unable or unwilling to respond due to use of central nervous stimulants such as cocaine, phencyclidine and methamphetamine (Amnesty International, 2006; McBride & Tedder, 2006; US Department of Justice, personal communication). Most victims have received multiple, and in some cases, prolonged Taser shocks and have been subject to multiple means of restraint (US Department of Justice, personal communication; Amnesty International, 2006). Use of methods of restraint that impair breathing is another common feature. Although these factors are not all present in every case, they appear to represent a cluster of risk factors, different combinations of which are associated with death following the use of Tasers.

Mental health issues

There are no reports specifically addressing the mental health effects of Tasers. This includes the effects of using the Taser on people with a mental illness and those without. It is noted, however, that 19% of deaths discussed in the briefing paper from the National Institute of Justice were of people with mental illness. People in states of acute agitation related to mental illness may experience the high levels of arousal associated with unexplained death in custody (Robison & Hunt, 2005). In addition, people taking prescribed antipsychotic medications are already at increased risk of sudden cardiac death (Straus et al, 2004). In addition to any traumatising effect of Tasers, their use in mental health emergencies is likely to have a deleterious effect on subsequent engagement with mental healthcare owing to an increased perception of coercion (McKenna et al, 1999).

National Institute of Justice study

The US National Institute of Justice has begun a 2-year study into deaths proximal to Taser use (US Department of Justice, personal communication). The study will compare three groups of ten: those who have undergone Taser shocks and where a medical examiner has ruled the Taser was either causative or contributory; those who have undergone Taser shocks and where a medical examiner has ruled the Taser was not a factor in the death; and those whose deaths in custody share features of Taser-related deaths but did not involve Tasers. Although the numbers are small, this study is likely to make a significant contribution to understanding the factors contributing to deaths following Taser use.

Discussion

Tasers appear to be safe when used on healthy individuals (Bleetman et al, 2004; Jenkinson et al, 2006). The rate of mortality and morbidity is low when the number of reported deaths and injuries is considered in relation to the widespread use of Tasers in the USA. However, as Tasers become more widely used health researchers need to monitor their possible health consequences, including effects on mental health (McBride & Tedder, 2006). The question of the contribution of Tasers to unexplained deaths in custody remains unresolved. Inconsistencies and inadequacies in the documentation of Taser-related deaths and injuries mean that there is likely to be under-reporting of these events (McBride & Tedder, 2006). Reports of cause of death are likely limited in the case of Tasers because attributions of cause of death are usually made on the basis of the final failure of vital organs, rather than on the basis of multiple contributing factors (McBride & Tedder, 2006). The multiple factors operating in Taser-related deaths require closer analysis of the sort being undertaken by the National Institute of Justice in order to be more fully understood. In particular, the hypothesis that Tasers may contribute to an already high level of arousal of agitated individuals, and thus to their eventual death, needs to be researched.

We were surprised by the lack of literature on the implications of Taser use on individuals with mental illness, and the lack of attention to the mental health implications of Taser use on all populations. As Jenkinson et al (2006) assert, any use of force has the potential to cause injury. We would add that force is also a source of trauma for both police and for the victim. Tasers may be legal and even necessary from a law enforcement perspective, but as McBride & Tedder (2006) noted, health researchers need to investigate their mental health consequences.

Making an informed decision about whether Tasers are appropriate for police use is a public policy decision (Rappert, 2004a), one factor in which is the health implications of their use. Also relevant are wider issues such as prevention of injury or harm to others and the image of the police. For instance, these issues may well be different if the proposed use is limited to an alternative to lethal force. This cost–benefit argument is different from that involved in issuing Tasers to previously unarmed



police officers, where the Taser becomes an alternative to, for example, pepper spray, as recommended by Jenkinson et al (2006), or is simply used as a means of gaining compliance or deploying fewer police officers. Furthermore, as health professionals are required at times to provide care following the use of Tasers, it is imperative that clinical and ethical guidelines for health professionals are promulgated. This is particularly so when the police are involved in the processes of detaining a person with mental illness under civil commitment statutes. Use of Tasers is a public policy issue that demands the vigilance of health professionals and researchers (Rappert, 2004b).

Declaration of interest

None.

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