



Excited delirium syndrome (ExDS): Situational factors and risks to officer safety in non-fatal use of force encounters



Simon Baldwin^{a,b,*}, Christine Hall^{c,d,e}, Brittany Blaskovits^a, Craig Bennell^a, Chris Lawrence^f, Tori Semple^a

^a Carleton University, Ottawa, Ontario, Canada

^b Royal Canadian Mounted Police, Ottawa, Ontario, Canada

^c Department of Emergency Medicine, University of British Columbia, Vancouver, Canada

^d Faculty of Medicine, Department of Emergency Medicine, University of British Columbia, Canada

^e Faculty of Medicine, Department of Community Health Sciences, University of Calgary, Canada

^f Police Research Lab, Carleton University, Ottawa, Ontario, Canada

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ABSTRACT

Study objective: Police use of force (UoF) encounters include individuals with Excited Delirium Syndrome (ExDS) with some frequency. Situational factors and risks to officer safety associated with these encounters have not been well studied. We examined the likelihood that subjects displaying various concomitant features of ExDS were under the influence of drugs and/or alcohol. We also examined the extent of subject violence, and the impact of this behaviour on the encounter (e.g., the odds of a struggle). Greater understanding of the prevalence of ExDS and the specific risk it represents to law enforcement officers and the subjects they encounter will guide appropriate policy and response strategies.

Methods: A prospective evaluation of a consecutive cohort of subjects involved in UoF encounters with police was conducted. Data were collected from January 2012 to December 2015. Consistent with previous research, the presence of six or more features was used to identify probable cases of ExDS. The odds that subjects in a state of probable ExDS were under the influence of drugs and/or alcohol was calculated and compared against subjects who exhibited less than three features of ExDS. In addition, the violent nature of subjects (e.g., the odds of a subject being in possession of a weapon) displaying various concomitant features of the syndrome was examined. The number of sudden and unexpected arrest-related death (ARDs) was documented.

Results: UoF occurred in 9006 of 10.9 million police–public interactions (0.08%). Of the UoF encounters, 156 (1.7%) subjects displayed six or more features of ExDS. With four recorded sudden and unexpected ARDs of violent and agitated subjects in our cohort, up to 6.3% of these subjects experiencing probable ExDS could be expected to be at risk of sudden death. Logistic regression analyses indicated that there were significantly higher odds that subjects exhibiting more features of ExDS (e.g., six or more) were under the influence of drugs. On the other hand, there were significantly lower odds that individuals exhibiting ExDS were under the influence of alcohol alone. In addition, those displaying a greater number of features demonstrated higher odds of engaging in assaultive behaviour, presenting a threat of grievous bodily harm or death, and being involved in a struggle that went to the ground with an officer. A slight increase in the presence of weapons was observed in encounters with probable ExDS.

Conclusion: Our study provides important information to guide the development of policy and procedure in law enforcement. Police encounter a subject with ExDS 1 in every 58 UoF incidents (1.7%). Those individuals are at higher odds of being intoxicated with drugs according to officers' assessments and at risk of being further exerted during a struggle on the ground, both of which appear to play a major role in deaths associated to ExDS. There is a demonstrable increase in risk to officers and public safety from the violent behaviour displayed by subjects presenting a greater number of features of ExDS. Our data suggests that up to 6.3% of subjects in a state of ExDS could succumb to ARDs; however, we cannot comment on the prevalence of death for persons with ExDS who do not encounter police. Further research is needed to determine which force options optimize outcome for police and subjects. Additionally, research surrounding pathophysiology leading to death should focus on subjects with six or more features of ExDS. Ultimately, a better understanding in this area will contribute to improving the outcomes of these encounters for those suffering from ExDS and those tasked with assisting them.

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* Corresponding author at: Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1S 5B6, Canada.
E-mail address: simonbaldwin@mail.carleton.ca (S. Baldwin).

1. Introduction

Sudden and unexpected arrest-related death (ARD) in the context of police use of force (UoF) encounters has been discussed for >30 years in the modern medical literature. Studies of these deaths began when Wetli and Fishbain (1985) documented noticeable likenesses in the presentation of individuals intoxicated with cocaine who died during police UoF incidents, such that they believed a new syndrome had been identified. They coined this syndrome “excited delirium,” which has since been defined as “...a state of extreme mental and physiological excitement, characterized by extreme agitation, hyperthermia, hostility, exceptional strength and endurance without apparent fatigue” (Morrison & Sadler, 2001, p. 46). Probable cases of ExDS are based on the presence of at least six of the following 10 potential criteria for ExDS: pain tolerance, constant/near constant activity, not responsive to police presence, superhuman strength, rapid breathing, does not fatigue, naked/inappropriately clothed, sweating profusely, tactile hyperthermia, and glass attraction/destruction (American College of Emergency Physicians Excited Delirium Task Force, 2009; Baldwin, Hall, Bennell, Blaskovits, & Lawrence, 2016; Hall & Votova, 2013; Vilke et al., 2012). It has been argued that exhibiting six or more of these features indicates that an individual is in a highly abnormal state, one that could only be described as a medical emergency (Hall & Votova, 2013).

Examination of the observed symptoms across documented cases of ExDS has contributed to the evidence for the development of a case definition of ExDS (Baldwin et al., 2016; Gonin, Beysard, Yersin, & Carron, 2017). However, numerous co-factors are often involved in these deaths, including substance use, mental illness, abrupt cessation of psychiatric medication, poor physical health, psychological and physiological stress, as well as a prolonged struggle (Coyne, Ly, & Vilke, 2017; Vilke, Debard, et al., 2012; Vilke & Payne-James, 2016). As a result, ExDS, with its unknown and varying pathophysiology, has remained a “contested diagnosis” in the medical field (Jutel, 2011). An investigation of common situational factors is required for a greater understanding of the onset of ExDS and one's relative risk of ARD. Importantly, this understanding could also lead to more appropriate response protocols (e.g., in terms of training, interventions, and/or policy development), and ultimately support the recognition of ExDS by the American Psychiatric Association (American Psychiatric Association, 2000) and the World Health Organization (Ranson, 2012; World Health Organization, 2008).

Moreover, while previous research has shown that violent behaviour is a common feature of ExDS (arguably too common, in fact, to be distinguishing; Baldwin et al., 2016; Hall & Votova, 2013), the nature of this violence, and the extent to which it varies in severity depending on the presence of ExDS symptoms, has not been studied. The risk to first responders, primarily police officers, who are tasked with engaging and attempting to de-escalate these individuals is important to understand. If officers were more aware of the type of danger that could ensue upon encountering individuals in a state of ExDS, and be better equipped to recognize the features, then ARDs, as well as subject and officer injuries, could potentially be mitigated. For example, if a subject presenting a high number of the features of ExDS is assessed as a potential medical emergency, it will help ensure appropriate emergency medical services (EMS) are immediately requested to attend the scene.

1.1. ExDS and intoxicants

It has been shown that substance use, particularly chronic use of stimulants such as cocaine and methamphetamine, often precedes the onset of, and deaths associated with, ExDS (Coyne et al., 2017; Vilke, Debard, et al., 2012; Vilke & Payne-James, 2016). In fact, a review of the literature indicated that almost nine out of 10 subjects in a state of ExDS were under the influence of some sort of substance (Grant, Southall, Mealey, Scott, & Fowler, 2009; Mash et al., 2009; O'Halloran & Lewman, 1993; Stratton, Rogers, Brickett, & Grunzinski, 2001). Stimulants, particularly cocaine, were the most prevalent (Grant et al., 2009;

Mash et al., 2009; Pollanen, Chiasson, Cairns, & Young, 1998; Ross, 1998; Ruttenger, McAnally, & Wetli, 1999; Stratton et al., 2001). Given that alcohol is a depressant, it is not surprising that there is a much lower prevalence of it in subjects (28% rate of alcohol use was observed across all known studies); although, for the majority of these cases, subjects had ingested both alcohol and stimulants (Mash et al., 2009; Ross, 1998; Ruttenger et al., 1997; Stratton et al., 2001).

1.2. ExDS and physical exertion

A risk factor for subjects experiencing ExDS is strenuous physical exertion. A struggle between an officer and subject, particularly one with a subject who is already agitated and displaying the symptomology of ExDS, would be expected to increase the risk of the subject experiencing ARD. For example, Ho et al. (2010) conducted a study where they simulated physical resistance and fleeing; this led to increased metabolic acidosis (too much acid in bodily fluids) and a catecholamine surge. They concluded that acidosis and/or surges in catecholamines can act as contributing or causal mechanisms in sudden deaths. Vilke, Debard, et al. (2012) have also noted that metabolic acidosis appears to contribute to cardiovascular collapse in fatal cases of ExDS.

Hyperthermia is a distinguishing feature of ExDS (Baldwin et al., 2016), and has been described as a harbinger of death (Hall et al., 2013; Vilke & Payne-James, 2016). Hyperthermia is defined as an elevated body temperature due to failed thermoregulation (Vilke, Bozeman, Dawes, Demers, & Wilson, 2012). A prolonged and strenuous struggle with an overheating subject can contribute to increases in core body temperature and exacerbate a hyperthermic state (Vilke & Payne-James, 2016). An intense struggle would also further delay the administration of treatment, such as sedatives and cooling measures (Vilke, Bozeman, et al., 2012; Vilke & Payne-James, 2016), potentially resulting in even higher risk for the subject.

It has been argued that there is a “period of peril” wherein a spike in both epinephrine and norepinephrine occurs following strenuous exercise (DiMaio & DiMaio, 2006; Dimsdale, Hartley, Guiney, Ruskin, & Greenblatt, 1984). During this period, there is an increased risk of cardiac arrhythmias and ischemia. Individuals with a “higher degree of chronic stress (with higher long-term levels of catecholamines) tend to have higher mortality rates during acute episodes of severe stress” (US Department of Justice, 2011, p. 17). Excessive strenuous movement in combination with heavy drug use, dehydration, or poor nutrition can also cause rhabdomyolysis (Vilke & Payne-James, 2016). This occurs when “...muscle fibers break down releasing chemicals, namely myoglobin, into the blood that are harmful to the kidneys” (International Association of Chiefs of Police, 2014, p. 3). Therefore, even if a subject is resuscitated, the risk of a fatal outcome due to renal failure remains (Mash et al., 2009; Ruttenger et al., 1999).

1.3. Risks to officer safety

Due to the agitated, violent, and erratic state displayed by individuals suffering from ExDS, the police are almost invariably involved in encounters with them. In one study that looked at fatal cases of ExDS within custodial settings, law enforcement represented 66% of the cases (Grant et al., 2009). It is also not surprising that many, if not all encounters, involved some sort of forceful struggle, although only two articles have specifically reported on this (O'Halloran & Lewman, 1993; Stratton et al., 2001). In both studies, a forceful struggle ensued between officers and subjects (100% of cases). Police UoF is often required in order to gain control of individuals suffering from ExDS. However, given the nature of ExDS symptomology (e.g., pain tolerance, constant/near constant activity, superhuman strength), typical UoF interventions (e.g., physical control, oleoresin capsicum [OC] spray) that rely on pain compliance or manual force may be rendered ineffective (Blaskovits, Baldwin, Hall, Bennell, & Lawrence, 2017), which would

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