



Original communication

Restraint in police use of force events: Examining sudden in custody death for prone and not-prone positions



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ARTICLE INFO

Article history:

Received 22 July 2014

Received in revised form

22 November 2014

Accepted 13 December 2014

Available online 6 January 2015

Keywords:

Sudden in custody death

Prone

Restraint

Conducted energy weapon

Excited delirium

ABSTRACT

Little is understood about the incidence of sudden death, its underlying pathophysiology, or its actual relationship to subject positioning. We report data from 4828 consecutive use of force events (August 2006–March 2013) in 7 Canadian police agencies in Eastern and Western Canada. Consecutive subjects aged >18 years who were involved in a police use of force event were included regardless of outcome. Officers prospectively documented: final resting position of the subject (prone or non-prone), intoxicants and/or emotional distress, presence of features of excited delirium, and the use of all force modalities. Our outcome of interest was sudden in-custody death. Our study has 80% power to detect a difference of 0.5% in sudden death between the positions. In over 3.25 million consecutive police–public interactions; use of force occurred in 4,828 subjects (0.1% of police public interactions; 95% CI = 0.1%, 0.1%). Subjects were usually male (87.5%); median age 32 years; 81.5% exhibited alcohol and/or drug intoxication, and/or emotional distress at the scene. Significantly more subjects remained in a non-prone vs. prone position; but over 2000 subjects remained prone. One individual died suddenly and unexpectedly in the non-prone position with all 10 features of excited delirium. No subject died in the prone position. There was no significant difference in sudden in custody death, in a worst case scenario 99.8% of subjects would be expected to survive being in either the prone or non-prone position following police use of force.

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1. Introduction

A number of subjects succumb to unexpected sudden death following a police use of force event that includes some form of restraint. These sudden in-custody deaths are devastating for the families and communities as well as the police professionals and agencies involved, and they often command wide media attention. Regardless of media interest, sudden in-custody death represents an important medical issue. Yet, despite continued cases of sudden

in-custody death and much postulation about mechanism, little is understood about the incidence of sudden death, its underlying pathophysiology, or its actual relationship to subject positioning.

The role of subject positioning following police use of force events in sudden in-custody death has remained under close scrutiny since the publication of three cases of sudden, unexpected deaths following prone positioning of subjects in the 1990's.¹ In these cases, and in subsequent cases,^{2–6} when a clear cause of death is not evident, medical examiners have often reported that

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the sudden in-custody death was caused by positional asphyxia. Positional asphyxia is usually defined as compromise of ventilation because of sustained interference with the chest and/or diaphragm or occlusion of the upper airway due to sustained abnormal positioning of the body.⁷ Because of this, prone positioning used during or after a police use of force event has been commonly implicated as the causal factor in the subject's death, irrespective of the duration of that positioning.^{3–5,8–10}

Recently, advanced physiologic monitoring has been used in experiments to determine the effects of the prone position on pulmonary function, cardiovascular function and sympathetic nervous system parameters.^{11–16} These studies have looked at effects of position, obesity, restraints, and weight placed on the back of a prone subject. Though small differences in physiologic values can be found, there is little evidence of any clinical significance. There are issues with the translation of laboratory studies, which are primarily conducted on healthy volunteers, to the community setting where subjects' physiology is often complicated by the presence of alcohol, stimulants or acute psychiatric distress, including the state of extreme psychomotor agitation and altered consciousness known as excited delirium.^{17–21}

There remains a deficiency in the systematic collection of high-quality data on the relationship between subject positioning and occurrence of sudden in-custody death under real-world conditions. While several case series exist that document outcomes in proned subjects, the true effect of positioning cannot be examined for its role in sudden in-custody death if only prone positioning is evaluated.^{1–3,5,6,22} To date, ours is the only epidemiologic study to prospectively document the number of individuals who remain prone or not-prone at the conclusion of a police interaction, and to describe the outcome for either position after police use of force. In previous work, we found that no subject had died when in the prone position following a use of force event in 1169 consecutive subjects.²³ The only death in that series of subjects occurred in an individual clearly documented to be in a not-prone position.

The purpose of this paper is to update and expand on our prospective, consecutive data set to include nearly 5000 consecutive use of force events from the police services in four urban centers in North America, to describe: (1) the nature of the subject and the use of force events; (2) the characteristics and proportion of individuals who remained in either the prone or not-prone position following a police use of force event; (3) the proportion of subjects who died suddenly overall in either the prone or not-prone position; and (4) whether there was a difference in the number of unexpected subject deaths in the prone vs the not-prone position.

2. Methods

2.1. Study design

This prospective, observational epidemiological study was undertaken as part of a larger, multicenter, epidemiologic study surrounding police use of force. Human subjects' committee approval was obtained at the relevant University and Health Authority Institutional Review Boards with approval for enrolment of subjects without consent, including extensive safeguards for subject privacy and the protection of personal information. (Part of the safeguard for subject privacy precludes the identification of the involved police agencies and cities in this report.)

2.2. Study setting and population

This paper reports on data collected from August 2006 until March 2013, representing 4828 consecutive use of force events in seven Canadian police agencies in four cities including Eastern and

Western Canada. In the seven agencies, during the enrolment period there were over 3.25 million police public interactions where a police officer and a member of the public were in the same physical space at the same time (i.e. simple calls without officer attendance are not included).

At each police agency, general duty officers are trained in, and have individual and immediate access to use of all force modalities, including: use of physical strikes, use of oleoresin capsicum (OC) spray ("pepper spray") (i.e. Sabre RED Crossfire – 1.33% major capsaicinoids/10% oleoresin capsicum; Security Equipment Corporation, Fenton, MO), use of handheld baton (i.e. Autolock 21" baton, MONADNOCK, Monadnock Fitzwilliam, NH), application of a vascular neck restraint, (i.e. Lateral Vascular Neck Restraint[®], National Law Enforcement Training Centre, Enforcement Training Center, Kansas City, MO), the deployment of a Taser X26[®] (Taser International, Scottsdale Arizona) conducted energy weapon ("CEW"), and use of firearms. Activities of special teams such as SWAT/Emergency Response Teams, canine officers, bomb squads or dive teams were excluded in this study of general police duty activities.

2.3. Inclusion criteria

Subjects aged 18 years or greater who were involved in a use of force event with police were included regardless of the cause or outcome of that interaction. At all agencies, a use of force event was recorded if any action above the application of a simple joint lock (e.g., a bent wrist or straightened elbow) to gain compliance occurred. Officers were agency mandated to record all use of force modalities specific to that use of force event as a matter of policy and our database was compared to agency records to ensure that 100% compliance occurred.

2.4. Study protocol

Study data were collected by all general duty police officers during the course of their interactions with subjects either via electronic study forms embedded in the police service's standard electronic use of force report forms, or through paper forms completed in the duty room at the end of shift. Only one form per use of force event was recorded, regardless of the number of officers involved in the incident. Completion of all data points on the computerized forms was electronically mandated prior to submission, including indication of "unknown" information. Paper forms were audited regularly by the use of force coordinator at the involved agencies to ensure compliance. Unknown/missing data was investigated, and was not inferred to be a negative response; if the missing data could not be ascertained, it was indicated as "unknown".

2.5. Measurements

2.5.1. Positioning

Officers prospectively documented the final resting position of the subject, once physical control had been achieved and while awaiting disposition at the end of the police–public interaction. The final position of the subject could be indicated as any one of the following: face down, face up, side lying, sitting, kneeling or standing. For analysis, these data were subsequently categorized in a binary fashion as either prone (face down) or not-prone (face up, side-lying, sitting, kneeling or standing).

2.5.2. Officer assessment of intoxication or psychiatric distress

As part of the police assessment of the subject and scene, officers were asked to specifically record their perception of relevant

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