Expert review of the case of Sheku Bayou

Date of Birth: 30 SEP 1983

Prepared by:

Michael Eddleston MA PhD BM BChir ScD FRCPEdin FBPhS FEAPCCT

Professor of Clinical Toxicology, University of Edinburgh

Consultant Clinical Toxicologist and Pharmacologist, NHS Lothian

Consultant Clinical Toxicologist, National Poisons Information Service - Edinburgh

GMC registration: [redacted]

[redacted]

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I) Preamble

1. In preparing this report I am aware of the role of an expert witness, and of my need to deal with matters within my expertise and to provide a fair and accurate opinion with respect to this case.

2. I am a registered medical practitioner with a licence to practise and a Certificate of Completion of Training in Clinical Pharmacology and Therapeutics. I have over nineteen years' experience as a clinician and fifteen years' experience of treating poisoned patients. I am recognised as a national authority in clinical toxicology and an international authority in my fields of clinical toxicology research.

3. As a consultant clinical toxicologist, I work in the toxicology ward of the Royal Infirmary of Edinburgh where I am responsible for the care of patients who have overdosed on medicines or have recreational drug toxicity. I also review and advise on the care of patients in the emergency department and intensive care unit of the Royal Infirmary. I have cared for patients with stimulant drug-induced psychosis in my clinical practice.

4. I am a consultant clinical toxicologist in the UK's National Poisons Information Service (NPIS) Edinburgh unit of which I was Director from 2012 to 2017. As part of my NPIS work, I edit the NPIS online database TOXBASE that is used across the UK to guide the management of poisoned patients. I also provide an on-call service to the NPIS during which I speak by phone to health care workers from across the UK and Eire to advise them concerning the management of poisoned patients.

II) Instructions

5) I have been requested, and given instructions, by Mr Alasdair MacLeod, Senior Procurator Fiscal Depute of the Crown Office & Procurator Fiscal Service's Office, Hamilton, to produce a report concerning the death of Mr Sheku Bayoh.

6) I have been provided with the following documents:

- 1. copy of redacted witness statements
- 2. copy of redacted police statements
- 3. copy of the A&E notes
- 4. expert witness package
- 4.1 briefing paper
- 4.2 post-mortem report dated 18 June 2015
- 4.2.1 drug control independent analysis report
- 4.2.2 neuropathy report – brain examination
- 4.3 certified disc of CCTV and video footage
- 4.4 certified disc of post-mortem and other photographs of deceased
- 5. Drug control centre independent analysis report
- 6. Copy of deceased GP medical notes
- 7. Use of force Police Scotland Standard Operating Procedure
- 8. Expert witness reports

- 8.1 Dr Stephen Karch
- 8.2 Dr Jason Payne-James
- 8.3 Prof Mary Sheppard
- 8.4 Dr Anthony Bleetman
- 8.5 Dr Maurice Lipsedge
- 8.6 Dr John Parkes
- 8.7 Dr Elizabeth Soilleux
- 8.8 Prof J Crane
- Expert witness report by Dr Nathaniel Cary

III) Query

7) I have been asked the following by Mr MacLeod:

"The Crown wish to instruct you to provide a general opinion on the individual and any synergistic effects of MDMA and alpha-PVP on the brain. In particular, the Crown are seeking to establish what effect the levels and combination of these two drugs may have had on the deceased's mood, cognitive ability, and behaviour"

I was asked to relate these effects explicitly to the case and the reported features he showed.

IV) Background

8) On the morning of the 3rd May 2015, the deceased (SB) was noted by friends and neighbours to be confused, agitated and aggressive, physically attacking people and cars. Phone calls were made to alert the police; Officers A and B were first on the scene, quickly followed by Officers C and D.

Officer A describes SB as walking towards him with his hands at his sides, without a visible knife. He describes SB as ignoring him and looking crazy, as if on a mission. SB ignored instructions from Officer A and continued to walk towards him. When SB did not respond to instructions, Officer A sprayed him with CS gas from about ten feet. Some of the CS spray hit SB but had no apparent effect. The spray however did hit Officer A, causing him to duck away behind the vehicle, putting his hands up to his face.

Officer B describes seeing SB walking at normal walking pace, with his hands by his side, without a visible knife. When approached and instructed by Office B, SB continued walking but turned his head in Officer B's direction while not appearing to understand any of the directions given. SB was hit by PAVA spray, sprayed from the side, but he wiped it off without apparent effect. Officer B was himself hit by the PAVA spray causing him to clutch his face in pain.

SB is not reported as showing aggression at this time towards either of these police officers.

Officer C reports that, after being sprayed by Officer B, SB turned away and walked off. Officer C shouted "desist". SB looked around but continued to walk away, followed by Officer C. After a

short time, SB stopped and faced Officer C. The Officer then sprayed CS liquid into SB's face. He reported that there was no reaction from SB.

Officer D reports that 3 police officers now faced SB which caused him to stop moving and speak for the first time, asking 'What'? He then became aggressive and assumed a boxing stance.

SB then attacked Officer D, chasing after her, punching her then stomping on her back as she lay on the floor. To protect Officer D, Officer C and Officer B struck SB with batons, physically pushed him to the ground, and restrained him initially in a face down position. Officer C reports that SB was incredibly strong, able to lift two well-built police officers off the ground.

After a few minutes of restraint, SB was noted to not be moving and then in cardiac arrest on arrival of an ambulance crew. After prolonged cardiac resuscitation, he was pronounced dead in the emergency department of Kirkaldy hospital.

The details of the events of the morning are described in the witness reports and summarised in the Expert Report of Dr Bleetman.

9) Witnesses B, C and D report SB's mood changing after drinking rum at around 04.05 that morning. Witness D thought that SB might have taken a recreational drug. Later that morning, witness B reports that SB handed over purple coloured tablets and a white powder which he then disposed of.

V) Toxicology analyses

10) The Expert Witness pack reports the Toxicology results: α-PVP 0.07 mg/L (70 mcg/L) pre-mortem, 0.29-0.31 mg/L post mortem; MDMA 0.48-0.65 mg/L (480-650 mcg/L) pre-mortem, 0.66 mg/L post mortem, and MDA (a metabolite of MDMA) at concentrations up to 0.23 mg/L (230 mcg/L) pre-mortem but undetectable post mortem.

An analysis of SB's urine performed at King's College London identified nandrolone and metabolites.

VI) Psychiatric diagnosis

11) Dr Lipsedge in his Expert Witness Report of the 16th January 2016 provides a retrospective psychiatric diagnosis for SB. His review of the witness statements, toxicology reports, and CCTV footage causes him to diagnose SB as having psychostimulant psychosis.

This is consistent with my interpretation of the witness statements. Clinical toxicologists would generally use the term 'drug-induced psychosis', in this case refined to 'stimulant or sympatho-mimetic drug-induced psychosis' (either ICD10 F14.5 or ICD10 F15.5, depending on the drug). This is similar to the diagnosis of 'excited delirium' that is used in the USA. The term 'excited delirium' is not used in British clinical toxicological practice, being absent for example from TOXBASE, the NPIS database used by clinicians from primary care, ambulance services, and hospitals across the UK to guide management of poisoned patients.

VII) Effects of α-PVP and MDMA.

12) α-PVP is a relatively new synthetic cathinone stimulant drug, with similar effects to other stimulant drugs such as cocaine, amphetamine and metamphetamine. It blocks the dopamine transporter, increasing dopamine concentrations at synapses. Review of the literature indicates that α-PVP intoxication can cause disorganization, delusional thinking, hallucinations, and in some patients intense paranoia associated with violent aggression [1].

In a case series of 42 patients reported by the Swedish STRIDA project with confirmed isolated α-PVP exposure, 25 (60%) had moderate poisoning, 7 (17%) had severe poisoning and 2 (5%) died [2]. Tachycardia and agitation occurred in 80% and 70% of cases, respectively, while delirium and hallucinations occurred in 18% and 20% of cases. The α-PVP concentration in serum ranged from 4 to 606 (median 64; n = 42) mcg/L.

A large prospective cohort study recently reported from Yekaterinburg, Russia, consists of 161 patients with isolated α-PVP intoxication, 87 patients co-ingesting ethanol with α-PVP, 138 patients taking α-PVP with other drugs (but no alcohol), and 300 control patients who had taken a range of recreational drugs but not α-PVP [3]. Patients who had taken α-PVP were more likely to show psychosis than controls (63.9% vs 35.7%, $P<0.05$); the presence or absence of other agents (including alcohol) did not affect the incidence of psychosis in α-PVP intoxicated patients.

13) Death is recognised to occur after α-PVP exposure [1]. A 28 year old man died after cardiac arrest in the community [4]; his post mortem α-PVP blood concentration was 174 mcg/L. In the above Russian study [3], five patients died, one from cardiac arrest after exposure to α-PVP alone (four after mixed exposures). In the STRIDA case series reported above, a patient died from intracerebral haemorrhage with a blood α-PVP concentration of 304 mcg/L in [2].

Death following restraint has been documented. A man in his mid-20s who developed psychosis died from sudden cardiac death after prolonged restraint from his roommates; α-PVP blood concentration was 411 mcg/L [5]. Death occurred in a man in an agitated and delirious state who was arrested, and restrained, and had a cardiac arrest in the police car [2]. His α-PVP blood concentration was 62.6 mcg/L 36 hrs after hospital presentation.

14) MDMA is a widely used entactogenic phenethylamine drug. It causes hyperstimulation of the central and autonomic nervous systems via increased release and reduced uptake of serotonin as well as dopamine and norepinephrine. Severe toxicity is relatively rare, with a poor dose-response relationship perhaps due to individual variation in metabolism of the drug. Hyper-thermia is well recognised, resulting sometimes in disseminated intravascular coagulation, multi-organ failure and death.

Psychosis appears to be relatively uncommon after MDMA use. In a case series of 5,529 cases of recreational drug intoxication presenting to hospitals across Europe in 2013-14, psychosis was diagnosed in 348 (6.3%) patients [6]. Drugs associated with the highest incidence of psychosis were tryptamines, MDPV, and methylphenidate (each between 23 and 57% of cases). MDMA was associated with psychosis in only 4.3% of cases.

VIII) Role of α-PVP and MDMA in causing SB's drug-induced psychosis

15) It seems likely that α-PVP was primarily responsible for SB's drug-induced psychosis since this feature is a common consequence of α-PVP exposure resulting in presentation to hospital [3]. It is possible that exposure to MDMA increased the risk of drug-induced psychosis; however, the same study showed no clear increase in the incidence of psychosis in patients taking other recreational drugs as well as α-PVP, compared to those taking α-PVP alone. This evidence makes MDMA unlikely to be the primary or secondary cause of the psychosis.

IX) Addendum – Police Scotland. Use of Force Standing Operating Procedure (PS UoF SOP).

16) I would like to make an additional comment on the PS UoF SOP which may be relevant to this case. I was provided with this document as background reading for my opinion.

17) The document provides, in Section 8, useful advice on the features of psychosis (8.1 – due to an error with numbering, this is the 2nd 8.1) and how to deal with patients suffering from mental health disorders including psychosis (8.7). Of note, only psychosis associated with schizophrenia is mentioned in section 8.1. Psychosis due to drug exposure is not included within this section.

Section 8.7.2 (p.17) provides suggestions to help officers deal with persons with mental health issues such as psychosis. For example: "do not approach from the rear as it may be deemed to be an attack (#1)", "stay calm and give the person the space they require so as not to put them under pressure" (#2), and "... express empathy" (#5). Both this and the next (8.7.3) section encourage speaking to the person to establish what is happening and their interpretation of the situation.

This advice is consistent with standard clinical practice for the management of psychotic patients, whether due to schizophrenia or to drug exposure.

Of note, there is little practical guidance to police on the diagnosis of schizophrenia or psychosis and it is not clear that police officers will be sufficiently confident of recognising such patients.

18) Within the PS UoF SOP, drug-induced psychosis is considered in a separate section (21.3), under the title 'Excited Delirium' (p27). The guidance offered to officers dealing with patients with mental health issues, including schizophrenic psychosis, is not provided to officers dealing with patients with drug induced psychosis. This is unfortunate since the principles are the same.

There can be differences between psychosis due to stimulant drugs and psychosis due to schizophrenia in that the sympathomimetic effect of stimulant drugs (often amphetamines, cathinones, cocaine) can cause transient increased energy, strength, and stamina, directed into struggling and violence. Because patients cannot understand what is happening, they will struggle forcefully for as long as they have the strength. They are unlikely to understand that they cannot win and calm down voluntarily. During restraint, stimulant drug users are at risk of dysrhythmias such as ventricular fibrillation.

The only practical advice offered to officers is that "the use of handcuffs, batons and CS Spray are all likely to be ineffective" (21.3.5) and that such patients should "be taken directly to hospital

once control has been established" (21.3.8), However, this transfer may be too late for some patients.

19) Psychotic patients from either cause are often confused, deluded and/or paranoid about the circumstances, and unable to understand instructions. As advised by the PS UoF SOP, psychotic patients need to be treated considerately with an awareness that they have difficulty understanding the situation.

20) Patients with acute psychosis are frequently assessed and cared for in emergency departments across the UK. Doctors are familiar with how to manage these difficult and sometimes dangerous encounters.

Initially, attempts will be made to speak to the psychotic patient, to reassure and calm him/her down. If the person appears to understand, and becomes calmer, s/he will be encouraged to take oral medicines such as benzodiazepines or anti-psychotic drugs to allow control of the situation. With ongoing conversation and discussion, an intramuscular injection of the anti-psychotic haloperidol might be offered and given with consent of the patient as well as necessary additional doses of oral medicines.

Sometimes the agitation is too great for this approach to work and the person cannot understand the situation or calm down. In this case, the person must be physically restrained to allow rapid and safe administration of intravenous or intramuscular sedative drugs, such as diazepam or ketamine. Duration of physical restraint is kept to an absolute minimal to reduce the risk of complications. As soon as the patient is sufficiently sedated with medicines, physical restraint is withdrawn. Although complete sedation and control of the situation may take a short while, intravenous or intramuscular medicines will start to have an effect quickly, calming the situation. The process of physical restraint followed by sedation with medicines should ideally not be started until sufficient skilled staff are ready, roles known, and drugs drawn up.

21) The situation in Kirkaldy on the morning of the 3rd May was stressful for the police officers. They believed that it might be a terrorist attack targeting them during their work. SB had already attacked one of his friends and been seen with a large knife while attacking cars.

However, SB is not reported to have been aggressive towards, or attacked, any of the police officers until he had been sprayed three times (a level 5 response to level 3 resistance, Use of Force Framework, p13)) and had three police officers facing him in a group. At that point, he seemed to believe that he was being threatened and then unfortunately attacked Officer D. He was not seen to be bearing a knife, although it was not possible for the police to exclude the possibility that he had it hidden on his body.

22) If the first police officers on the scene had realised that My Bayoh was psychotic, consistent with their observations that he was ignoring them and looking crazy, and had followed Police Scotland advice for dealing with psychotic patients, the outcome might have been different.

Ideally, open empathic questioning, while offering space to SB to keep walking, might have calmed the situation and prevented the attack or the need to restrain him physically until submission. In the meantime, an ambulance could have been called to help take SB to hospital.

If this conservative approach had been ineffective, a combined physical and chemical restraint approach would have been necessary. At the very least, an ambulance and paramedics should have been present when physical restraint was initiated. This would have allowed paramedics to rapidly gain intravenous access to administer sedative diazepam and/or haloperidol under the guidance if necessary from the local emergency department. At best, the restraint could have been delayed until a doctor had come urgently from the emergency department to help control the situation, allowing the administration of fast-acting ketamine.

23) Overall, the situation on that morning was difficult and fast moving. A powerfully built psychotic man had been violent to people and cars. He did not respond to clear police instructions.

Unfortunately, his psychosis prevented him from understanding the situation or the instructions. His paranoid thoughts caused him to attack the police, resulting in physical restraint until submission, without the aid of medicines to induce sedation administered by paramedical or medical staff. At the point physical restraint was started, his prognosis was poor.

24) Psychosis is a well-recognised complication of stimulant drug use with a poor prognosis when public safety requires physical restraint without medical support. However, revision of the PS UoF SOP, to present psychosis from schizophrenia and stimulant drugs together, as well as additional training in the assessment and management of such patients, may reduce the risk of further deaths from stimulant drug toxicity while under restraint.

A joint discussion between police and emergency medicine physicians in Scotland and UK might increase understanding of how to manage these complicated patients and refine the current guidance for the benefit of the psychotic patients and police officers.

Signed

[redacted]

Michael Eddleston

15 June 2017

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