

Committee on Toxicity review of behavioural and other effects of caffeine and alcohol

Fatalities due to caffeine.

Fatalities due to caffeine are not monitored in the UK. Whilst the National Programme on Substance Abuse Deaths is aware of caffeine being used as a 'cutting' agent in street drugs and 'legal highs' (see also Cole et al, 2011), there seems to have been only a few possible cases in the UK where caffeine may have had a role in causing or contributing to death. None of these cases were reported to np-SAD as they do not meet our case definition. However, through searches of Medline and the Internet it was possible to identify several recent deaths where caffeine was thought to have possibly played a part. These are dealt with by date of inquest.

Case 1

In February 2009 Mr Geoffrey Saul, HM Coroner for the East Riding of Yorkshire & Hull, recorded a verdict of natural causes in the case of Chloe Leach, aged 21, who died in September 2008 from cardiac arrhythmia (Long QT Syndrome); she was also epileptic. Media reports suggest that she had consumed 4 cans of Red Bull energy drink before collapsing at a club in Hull, and that the caffeine could have pushed her heart over the 'upper limit of normal' into abnormal. Following a conversation between the compiler and Mr Saul, the latter has now provided us with some details of the case, including the statements from the toxicologist and pathologist involved in the case.

http://www.upi.com/Top_News/2009/02/03/Caffeine-blamed-for-students-death/UPI-47841233720345/

The toxicologist states that the deceased was understood to have consumed 2 'Red Bulls', 2 vodkas, and 2 'Red Bull' and vodka combined. The toxicology results were: blood alcohol level of 153mg/dL on admission to hospital, and 143mg/dL at post mortem (PM). On admission there was a blood Lamotrigine (anti-epileptic) concentration of 3.5mg/l, PM blood concentration of 1.9mg/l and PM gastric concentration of 0.5g/l; these are consistent with therapeutic use. The PM blood caffeine level was 7.2mg/l. This level is likely to indicate the consumption of more than 1 to 2 cans of Red Bull or Coca Cola, and would be consistent with the possible 4 to 6 cans of Red Bull that had been ingested on the evening prior to death.

The deceased's mother suffered from Long QT Syndrome. If the deceased had not been previously tested, there was a possibility she also had undiagnosed Long QT Syndrome. The toxicologist was of the opinion that "caffeine will have had the effect of increasing the risk of arrhythmias". He concluded that:

1. ... [T]he caffeine is likely to have had a more than minimal contribution to the risk of arrhythmias in an individual who may have suffered with Long QT Syndrome.
2. [he] had not been provided with evidence that [the deceased] ... did indeed suffer with Long QT Syndrome, but there is a family history of such a condition.
3. Arrhythmias in Long QT Syndrome may also be precipitated by stressful environments, excessive physical activity and loud noises.
4. [The deceased] also suffered with epilepsy and although her anti-epileptic medication was within the therapeutic range, there was an increased risk of epilepsy with increased stressful response and sudden loud noises.
5. It is therefore [his] ... overall opinion that although there may well be an increased risk of death due to caffeine and possible Long QT Syndrome, [he] ... cannot exclude from the information provided ... that epilepsy has not had a more than minimal contribution to the mechanism of death.

Evidence given by the Consultant Neuropathologist indicated that an earlier ECG performed on the deceased showed a QT interval at the upper limit of normal. Her mother had a similar diagnosis, but

combined with “ventricular bigeminy and unimorphological ventricular ectopics”. There was, in addition, T-wave inversion in the antero-lateral leads”. One of the deceased cousin died at the same age of “myocardial insufficiency secondary to cardiomegaly”. It appears that the deceased had not had a seizure. The pathologist concluded:

“It is not unreasonable to suppose, therefore, that [the deceased] ... was a victim of a familial syndrome of epilepsy in association with a prolonged QT interval. This syndrome can result in polymorphic ventricular arrhythmias (torsade de pointes) and these arrhythmias can result in recurrent syncope, seizures and sudden death. Given the history of sudden death in two cousins at the age of 21, and cardiac arrest in her mother, it may be prudent to refer other family members for genetic counselling to confirm or refute the presence of the long QT or other syndrome in this extended family. Other causes of death are not excluded but, on the basis of probability, it is likely that death was due to a pre-existing cardiac condition known to be associated with sudden cardiac death. The fatal arrhythmia may well have been induced as a consequence of alcohol/caffeine combinations that are known to trigger arrhythmias in this condition. ... I suggest the cause of death be given as:

- 1a: Cardiac Arrhythmia
- 1b: Long QT Syndrome
- 11: Epilepsy”

This wording was accepted by the coroner and recorded as the official cause(s) of death.

Case 2

In May 2009 Mr Peter Watts, assistant deputy coroner for West Manchester, recorded an open verdict in the case of Tyler Johns, aged 11 of Bolton, who was found hanging in his bedroom by his mother, death was later confirmed at hospital as due to hanging. Media reports suggest that his behaviour had become bad after drinking 'energy' drinks, to the extent he had been sent home from school for being disruptive on the day of his death. Apparently an empty 1 litre caffeine drink was found near his body. Media reports suggest that his father thought the drinks had contributed to his son's death.

<http://www.dailymail.co.uk/news/article-1178249/Energy-drinks-killed-son-says-devastated-father.html>

Mrs Jennifer Leeming, HM Coroner for West Manchester, spoke with the compiler on 17 January about this case. She had read through the parents' statement, and concluded that the deceased's intake of caffeine-based energy drinks had at the very least contributed to his bad behaviour. It had set in train a series of events which culminated in his death. As the contents of the energy drink had apparently been poured down the sink, there was probably no toxicology testing for caffeine. The Coroner has promised to provide np-SAD with an appropriate form of words than be used relating to the link (if any) between energy-drink consumption and the death of the deceased.

Case 3

In October 2010, Dr Chapman the then Coroner for Nottinghamshire, recorded a verdict of accidental death in the case of Michael Lee Bedford, aged 23 of Mansfield, who died in hospital on 9 April from toxic caffeine poisoning. He had apparently taken an amount (reported as two

teaspoons) of a product bought legally on the Internet. Apparently the recommendation is not to exceed one-sixteenth of a teaspoon. np-SAD are awaiting further information from the Nottinghamshire coroner.

<http://www.bbc.co.uk/news/uk-england-nottinghamshire-11645363>

<http://healthland.time.com/2010/11/02/a-man-dies-after-overdosing-on-caffeine/>

<http://www.thisisnottingham.co.uk/Strong-caffeine-products-banned-says-grandmother-Notts-boy-overdosed/story-12264014-detail/story.html>

References

Cole C, Jones L, McVeigh J, Kicman A, Syed Q, Bellis M. Adulterants in illicit drugs: a review of empirical evidence. *Drug Test Anal.* 2011 Feb;3(2):89-96. doi: 10.1002/dta.220. Epub 2010 Dec 29.

Compiled by

John Corkery, Honorary Research Fellow and Programme Manager for the National Programme on Substance Abuse Deaths based in the International Centre for Drug Policy at St George's University of London; Research Lead, School of Pharmacy, University of Hertfordshire. j.corkery@herts.ac.uk

3 February 2012

NOTE

The family of Chloe Leach (case 1) have enquired if they can be provided with a copy of the evidence submitted to the Committee. I have indicated to Mr Saul that we could provide a copy of this submission, but am unsure of the status of any other evidence submitted.