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Phenazepam: A review of medico-legal deaths in South Scotland between 2010 and 2014

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ABSTRACT

Phenazepam is a long acting benzodiazepine that is not prescribed in the United Kingdom. In Scotland it has been detected in a large number of post mortem cases, but very little data has been published looking at post mortem concentrations of this drug and indeed concentrations that may be associated with causing death. We looked at all post mortem cases between 2010 and 2014 where phenazepam was found in blood and correlated these with the given cause of death. The data collected shows the variability in reporting of phenazepam deaths and will provide a useful tool for those deciding when phenazepam should or should not be included as a cause of death. Cases discussed include drug related deaths with phenazepam as the sole cause of death (as is), drug related death when the cause of death was noted as being from a combination of phenazepam plus one or more other drugs (range <0.005–0.9 mg/L, median 0.10 mg/L) and causes of death in non-drug related deaths where phenazepam was detected (hangings range <0.05–0.39 mg/L, median 0.09 mg/L and deaths due to ischaemic heart disease range 0.05–0.1 mg/L, median 0.04 mg/L).

1. Introduction

Phenazepam (sometimes termed fenazepam), 7-bromo-5-(2-chlorophenyl)-1,3-dihydro-2*H*-1,4-benzodiazepin-2-one, is a long acting benzodiazepine developed in the former Soviet Union in the 1970s [1] and it is not prescribed in the United Kingdom. Its street names include 'Bonsai' and 'bonsai supersleep' and it can be obtained in liquid, crystal or pill form. We have a huge illicitly produced diazepam market in Scotland and often when phenazepam is found, diazepam is also present suggesting that the illicitly made diazepam tablets have phenazepam mixed in with them rather than the main source being diverted phenazepam tablets from Russia. In addition you could buy phenazepam powder over the internet until it was banned.

This drug has become a concern due to the number of hospitalisations and fatalities [1] it has been involved in and was increasingly being detected in drug related deaths. The definition of a drug related death is outlined in the Drug Related Deaths Database [2] and includes cases where the underlying cause of death is due to a drug listed under the Misuse of Drugs Act (1971).

It was initially being sold as a 'legal high' and available over the internet and in "head shops" before being criminalised in 2012 as a class C drug in the Misuse of Drugs Act 1971. There is little data published looking at phenazepam concentrations in post mortem cases: Firstly, a letter to the BMJ [3] in 2011 describing 9 cases where post mortem blood samples contained phenazepam, but concentrations were not stated and secondly, a case where death was described as being from the ingestion of phenazepam and poppy seed tea [4].

2. Methods

The south of Scotland is served by two forensic pathology departments, one based in Edinburgh and the other in Glasgow. Combined, they undertake approximately 3500 post mortem examinations per year (and serve a population of approximately 3 million people), including natural and non-natural deaths, all carried out under the instruction of the Procurator Fiscal Service. Prior to April 2013, toxicology taken from these cases was sent to different laboratories (Scottish Police Authority Forensic Services (SPA) in the East and the University of Glasgow (UoG) in the West). After this date, toxicology from both departments was analysed by the University of Glasgow. The SPA laboratory began analysing for phenazepam in September 2010 and the UoG in December 2010.

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Temazepam-d_5 was used at SPA and Diazepam-d_5 was used at UoG as an internal standard. The cases undertaken by SPA used a liquid–liquid extraction with LC-MS detection and had a Lower Limit of Quantification (LLOQ) of 0.02 mg/L. In the UoG laboratory, the LLOQ was 0.005 mg/L. Instruments were changed around February 2014 which made analysis more sensitive and reduced the Limit of Detection from 0.005 mg/L to 0.002 mg/L, but did not change the LLOQ. There are no known interfering factors when it comes to this drug.

Using the database for the two departments, all cases where phenazepam was detected in post mortem blood samples from 1st September 2010 to 31st December 2014 were identified. These cases were then looked at individually and the phenazepam concentration present was compared with the cause of death and concentrations of any other drugs present.

3. Results

During the period 2010–2014, 228 cases where identified where phenazepam was detected in post mortem femoral blood.

Two of these cases (Table 1) had a cause of death that was solely attributed to phenazepam.

Case number 1 was a case from Glasgow and the person died in June 2011, before the drug was criminalised. This was 46 year old man with a history of chronic alcohol abuse, but no other medical history. He was found dead at home. He had no significant injuries and early bronchopneumonia histologically. Case number 2 was a case from Edinburgh and the person died in December 2012, after the drug had been criminalised. This was a 26 year old man with a history of amphetamine, ecstasy and alcohol abuse, but no other medical history. He was found dead at home. He had no significant injuries or natural disease. 54 of these cases were classified as a drug related death and the cause of death was noted as being from a combination of phenazepam plus one or more other drugs (Table 2).

Table 1
Drug related deaths with phenazepam as the sole cause of death.

Number	Cause of Death	Phenazepam (mg/L)	Other drugs present
1	Phenazepam intoxication	1.2	Alcohol 22 mg/dL
2	Phenazepam intoxication	1.6	Diazepam 0.16 mg/L Dihydrocodeine 0.16 mg/L

In 83 cases, death was thought to be drug related and phenazepam was detected, but not included in the cause of death (Table 3).

In 89 cases death was not drug related but phenazepam was present but not included in the cause of death i.e. hanging, ischaemic heart disease (Chart 1).

4. Discussion

In general, interpretation of post mortem toxicology can be a very complicated and challenging task, made more difficult by the lack of a good evidence base. When phenazepam was first found in post mortem samples, and indeed even to this day, there was very little evidence-based information available to aid a forensic

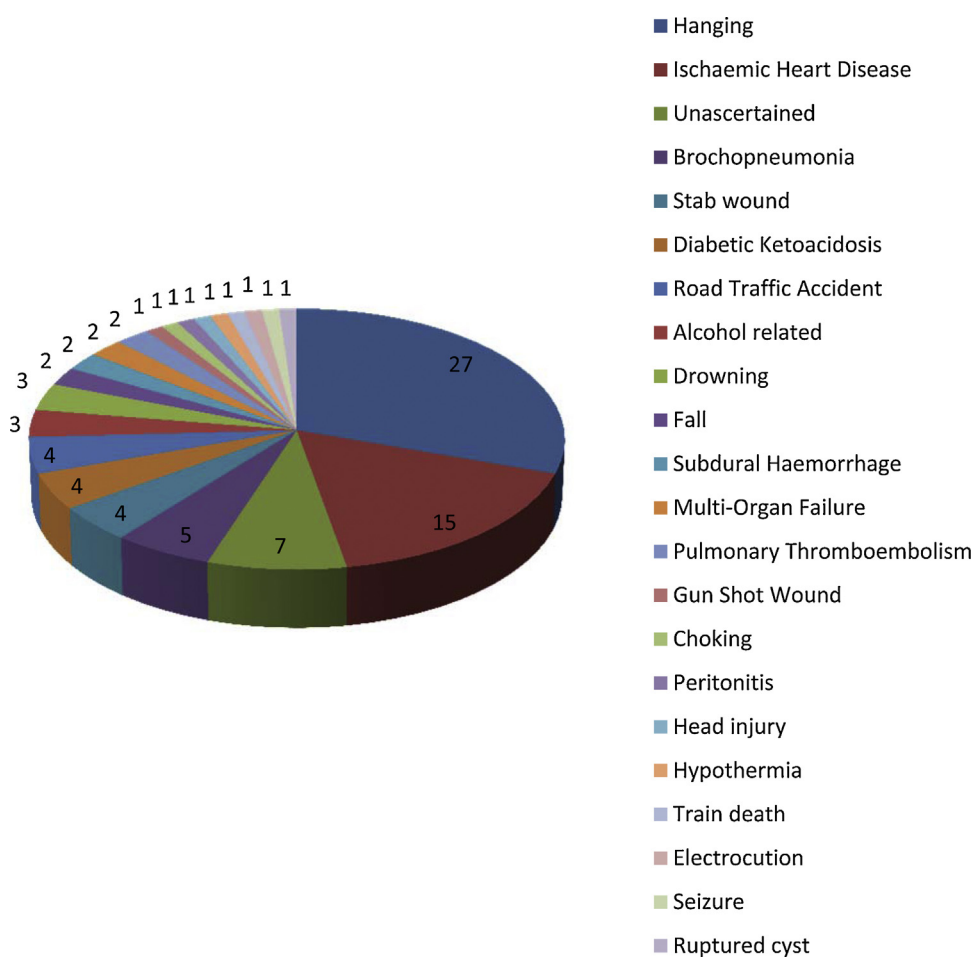

Chart 1. Causes of death in non-drug related deaths where phenazepam was detected.