

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 <0.005-0.9mg/L, median 0.10 mg/L) and causes of death in non-drug related deaths where phenazepam was detected (hangings range <0.05-0.39mg/L, median 0.09mg/L and deaths due to ischaemic heart disease range 0.05- 0.1mg/L, median 0.04mg/L).

KEYWORDS

Phenazepam, benzodiazepine, deaths, medico-legal, South Scotland

Introduction:

Phenazepam (sometimes termed fenazepam), 7-bromo-5-(2-chlorophenyl)-1,3-dihydro-2H-1,4-benzodiazepin-2-one, is a long acting benzodiazepine developed in the former Soviet Union in the 1970's¹ 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 fatalities¹ 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 Database² 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 BMJ³ 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 tea⁴.

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.

Temazepam-d₅ was used at SPA and Diazepam-d₅ 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.

Results:

During the period 2010 to 2014, 228 cases were 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.

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 22mg/dL
2	Phenazepam intoxication	1.6	Diazepam 0.16mg/L Dihydrocodeine 0.16mg/L

Case number 1 was a case from Glasgow and the person died in June 2011, before the drug was criminalised. This was a 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).

Number	Cause of Death	Phenazepam mg/L	Other drugs present
1	Multi-drug toxicity	<0.005	Cocaine <0.025mg/L Amitriptyline 0.08mg/L Morphine 0.06mg/L

			Methadone 0.06mg/L Gabapentin 30mg/L
2	Alcohol, morphine, etizolam and phenazepam	<0.005	Alcohol 294mg/dL Morphine <0.025mg/L Etizolam 0.034mg/L
3	Methadone, heroin, phenazepam, gabapentin, dihydrocodeine, mirtazapine, fluoxetine and diazepam	<0.005	Methadone 0.89mg/L Morphine 0.03mg/L Gabapentin 26mg/L Dihydrocodeine 0.17mg/L Mirtazapine 0.1mg/L Fluoxetine 0.14mg/L Diazepam 0.24mg/L
4	Combined alcohol, amphetamine, diazepam and phenazepam	<0.005	Amphetamine 1.5mg/L Alcohol 298mg/dL Diazepam 0.07mg/L
5	Methadone and phenazepam	0.01	Methadone 0.77mg/L
6	Alcohol and phenazepam intoxication	0.014	Alcohol 56mg/dL
7	Methadone and phenazepam	0.02	Methadone 1.3mg/L
8	Probable alcohol and benzodiazepine	0.02	Alcohol 135mg/dL Diazepam <0.05mg/L
9	Methadone, phenazepam, etizolam , codeine and amitriptyline	0.024	Methadone 0.95mg/L Etizolam 0.12mg/L Codeine 0.06mg/L Amitriptyline 0.99mg/L
10	Phenazepam and dihydrocodeine	0.038	Dihydrocodeine 1.1mg/L
11	Methadone, heroin, phenazepam and amitriptyline	0.04	Methadone 0.7mg/L Morphine 0.05mg/L Amitriptyline 0.57mg/L
12	Methadone and Phenazepam	0.04	Methadone 0.34mg/L Diazepam 0.35mg/L
13	Methadone and phenazepam	0.04	Methadone 0.39mg/L
14	Heroin, phenazepam, methadone, diazepam and mirtazapine	0.043	Morphine <0.025mg/L Methadone 0.90mg/L Diazepam 0.51mg/L Mirtazapine 0.58mg/L
15	Dihydrocodeine, gabapentin, phenazepam and etizolam	0.045	Dihydrocodeine 3mg/L Gabapentin 42mg/L Etizolam 0.073mg/L
16	Heroin, phenazepam and diazepam	0.05	Morphine 0.45mg/L Diazepam 0.45mg/L
17	Buprenorphine, phenazepam, amitriptyline and alcohol	0.06	Buprenorphine 5ng/mL Amitriptyline 0.07mg/L Alcohol 79mg/dL
18	Methadone and phenazepam intoxication	0.06	Methadone 0.41mg/L
19	Phenazepam, etizolam and morphine	0.067	Etizolam 0.38mg/L Morphine 0.17mg/L
20	Methadone and phenazepam	0.08	Methadone 0.29mg/L
21	Heroin and benzodiazepine	0.08	Morphine 0.59mg/L Diazepam <0.05mg/L Etizolam <0.005mg/L
22	Methadone, heroin and phenazepam	0.08	Methadone 0.77mg/L Morphine 0.01mg/L
23	Heroin and benzodiazepine	0.08	Morphine 0.59mg/L Diazepam <0.05mg/L Etizolam <0.005mg/L
24	Heroin and phenazepam	0.09	Morphine 0.31mg/L
25	Heroin and phenazepam	0.09	Morphine 0.56mg/L
26	Methadone, heroin and phenazepam	0.1	Methadone 0.59mg/L Morphine 0.04mg/L
27	Methadone, phenazepam and dothiepin	0.1	Methadone 0.13mg/L Dothiepin 0.58mg/L
28	Methadone, phenazepam and cocaine	0.1	Methadone 1.2mg/L Cocaine metabolite

29	Dihydrocodeine, methadone and phenazepam	0.1	Dihydrocodeine 1.6mg/L Methadone 0.28mg/L
30	Methadone, morphine, phenazepam and cocaine	0.11	Methadone 0.54mg/L Morphine 0.04mg/L Cocaine metabolites
31	Olanzapine, phenazepam and zopiclone	0.11	Olanzapine 0.42mg/L Zopiclone 0.01mg/L
32	Buprenorphine, phenazepam, and alcohol	0.11	Buprenorphine <5ng/mL Alcohol 159mg/dL
33	Methadone and phenazepam	0.11	Methadone 0.27mg/L
34	Dothiepin, gabapentin, tramadol, phenazepam and fentanyl	0.12	Dothiepin 3.3mg/L Gabapentin 23mg/L Tramadol 1.4mg/L Fentanyl 0.055mg/L
35	Heroin, cocaine, phenazepam and diazepam	0.16	Morphine 0.43mg/L Cocaine metabolites Diazepam 0.98mg/L
36	Heroin, dihydrocodeine and phenazepam	0.2	Morphine 0.36mg/L Dihydrocodeine 0.99mg/L
37	Methadone and phenazepam	0.21	Methadone 0.18mg/L
38	Methadone and phenazepam	0.24	Methadone 0.39mg/L Mirtazapine 0.06mg/L
39	Methadone and phenazepam	0.24	Methadone 0.34mg/L Diazepam 0.35mg/L
40	Methadone, phenazepam and amitriptyline	0.24	Methadone 0.51mg/L Amitriptyline 0.84mg/L
41	Methadone, codeine and phenazepam	0.26	Methadone 0.24mg/L Codeine 1.1mg/L
42	Alcohol and phenazepam	0.28	Alcohol 306mg/dL
43	Methadone and phenazepam	0.28	Methadone 0.25mg/L Pregabalin 8mg/L
44	Heroin, methadone, phenazepam and gabapentin	0.33	Morphine 0.33mg/L Methadone 0.75mg/L Gabapentin 103mg/L
45	Buprenorphine, phenazepam and alcohol	0.33	Norbuprenorphine 13ng/mL Alcohol 249mg/dL
46	Methadone and phenazepam	0.46	Methadone Present
48	Alcohol and phenazepam	0.55	Alcohol 333mg/dL
49	Methadone and phenazepam	0.64	Methadone 1.1mg/L
50	Methadone and phenazepam	0.82	Methadone 0.47mg/L
51	Multi-drug toxicity	0.9	Amphetamine 0.11mg/L Methadone 0.38mg/L Dihydrocodeine 0.73mg/L Diazepam 0.12mg/L
52	Dihydrocodeine and phenazepam	1.7	Dihydrocodeine 4.4mg/L
53	Phenazepam and morphine	1.7	Morphine 0.05mg/L
54	Tramadol, dihydrocodeine, diazepam and possible phenazepam	unquantifiable	Tramadol 7.8mg/L Dihydrocodeine 0.22mg/L Diazepam 0.17mg/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).

Table 3: Drug related deaths with phenazepam detected, but not included in the cause of death

Number	Cause of Death	Phenazepam (mg/l)	Other Drugs Present
1	Heroin	<0.005	Morphine 0.9mg/L
2	Heroin	<0.005	Morphine 0.08mg/l

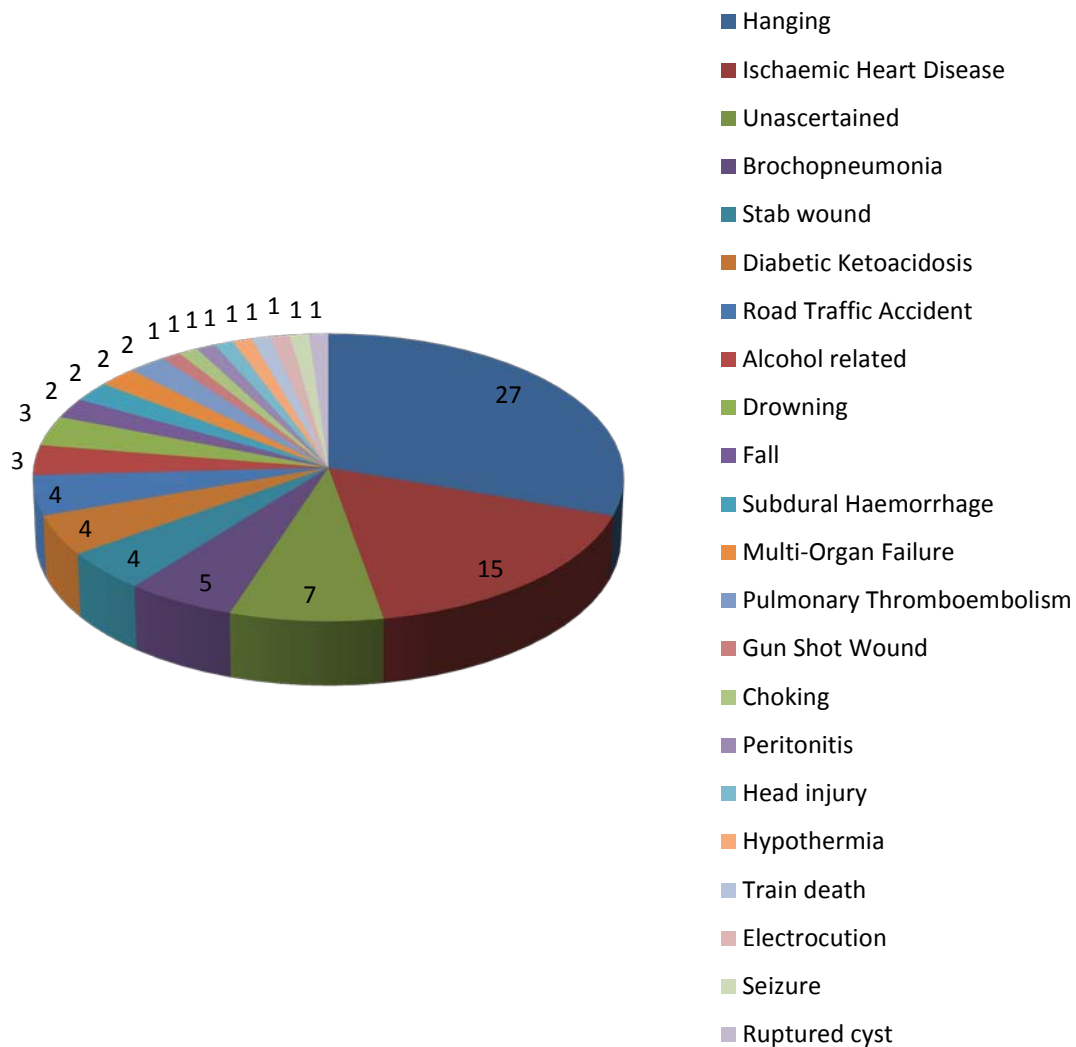
3	Volatile substances	<0.005	Butane 9.0mg/L Propane 1.0mg/L
4	Heroin and alcohol	<0.005	Morphine 0.33mg/L Alcohol 130mg/dL
5	Heroin	<0.005	Morphine 0.35mg/L
6	Heroin, methadone and pregabalin	<0.005	Morphine 0.25mg/L Methadone 0.06mg/L Pregabalin 104mg/L
7	Methadone	<0.005	Methadone 0.23mg/L
8	Heroin and methadone	<0.005	Morphine 0.18mg/L Methadone 0.14mg/L
9	Heroin and sertraline	<0.005	Morphine 0.21mg/L Sertraline 3.3mg/L
10	Heroin, methadone and pregabalin	<0.005	Morphine 0.06mg/L Methadone 2.3mg/L Pregabalin 45mg/L
11	Alcohol, mirtazapine, zopiclone and codeine	<0.005	Alcohol 307mg/L Mirtazapine 2mg/L Zopiclone 0.71mg/L Codeine 3.1mg/L
12	Multi-drug toxicity	<0.005	Cocaine <0.025mg/L Ecgonine Methyl Ester 0.05mg/L Benzoylecgonine >0.05mg/L Amitriptyline 0.08mg/L Morphine 0.06mg/L Methadone 0.06mg/L Gabapentin 30mg/L
13	Alcohol and methadone	<0.005	Alcohol 117mg/dL Methadone 2.2mg/L
14	Methadone and dihydrocodeine	<0.005	Methadone 1.4mg/L Dihydrocodeine 8.9mg/L
15	Methadone	0.005	Methadone 1.5mg/L
16	Dihydrocodeine	0.006	Dihydrocodeine 3.8mg/L
17	Heroin	0.008	Morphine 0.21mg/L
18	Heroin	<0.01	Morphine 0.35mg/L
19	Methadone, gabapentin and diazepam	0.01	Methadone 0.7mg/L Gabapentin 122mg/L Diazepam 0.46mg/L
20	Dihydrocodeine	0.01	Dihydrocodeine 8mg/L
21	Methadone and heroin	0.01	Methadone 0.54mg/L Morphine 0.8mg/L
22	Heroin, buprenorphine and alcohol	0.013	Morphine 0.22mg/L Buprenorphine <5ng/mL Alcohol 154mg/dL
23	Tramadol	0.02	Tramadol 285mg/L Methadone 1.1mg/L
24	Butane	0.02	Butane 1.3 mg/L Isobutane 0.14 mg/L propane 0.21 mg/L
25	Methadone and heroin	0.02	Methadone 0.59mg/L Morphine 0.1mg/L
26	Co-codamol and mirtazapine	0.02	Codeine 4mg/L Paracetamol 181mg/L Mirtazapine 1.2mg/L
27	Methadone	0.02	Methadone 1.4mg/L
28	Alcohol	0.02	Alcohol 471mg/dL
29	PMA, MDMA and cocaine	0.02	MDMA <0.10mg/L PMA 3mg/L Ecgonine Methyl Ester 0.17mg/L
30	Methadone	0.02	Methadone 0.50mg/L
31	Heroin	0.02	Morphine 0.47mg/L
32	Probable alcohol and benzodiazepine toxicity	0.02	Alcohol 135mg/dL Diazepam <0.05mg/L

33	Heroin	0.024	Morphine 0.16mg/L
34	Methadone and alcohol	0.026	Methadone 0.4mg/L Alcohol 142mg/dL
35	Heroin	0.03	Morphine 0.19mg/L
36	Heroin, cocaine, alcohol	0.03	Morphine 0.8mg/L Alcohol 128mg/dL Ecgonine Methyl Ester <0.025mg/L Benzoylecgonine 0.04mg/L
37	Alcohol	0.03	Alcohol 441mg/dL
38	Methadone and cocaine	0.03	Methadone 2.1mg/L Benzoylecgonine 0.035mg/L Ecgonine Methyl Ester- <0.025mg/L
39	Methadone and gabapentin	0.03	Methadone 0.9mg/L Gabapentin 38mg/L
40	Buprenorphine and cocaine	0.03	Buprenorphine <5ng/mL Ecgonine Methyl Ester 0.12mg/L Benzoylecgonine 0.18mg/L
41	Heroin and methadone	0.037	Morphine 0.19mg/L Methadone 0.2mg/L
42	Heroin	0.04	Morphine 0.33mg/L
43	Methadone and dihydrocodeine	0.04	Methadone 0.48mg/L Dihydrocodeine 3.1mg/L
44	Methadone	0.04	Methadone 0.47mg/L
45	Heroin and cocaine	0.04	Morphine 0.11mg/L Ecgonine Methyl Ester 0.27mg/L
46	Multi-drug toxicity	0.042	Methadone 0.27mg/L Diazepam <0.05mg/L Morphine <0.025mg/L
47	Morphine	0.045	Morphine 0.44mg/L
48	Heroin	0.05	Morphine 0.64mg/L
49	Heroin	0.05	Morphine 0.22mg/L
50	Heroin and cocaine	0.05	Morphine 0.14mg/L Ecgonine Methyl Ester 0.5mg/L
51	Heroin, tramadol and alcohol	0.05	Morphine 0.11mg/L Tramadol 1.9mg/L Alcohol 255mg/dL
52	Gabapentin, methadone and cocaine	0.05	Gabapentin 189mg/L Methadone 1.1mg/L Benzoylecgonine >0.5mg/L Ecgonine Methyl Ester 0.12mg/L
53	Alcohol	0.053	Alcohol 479mg/dL
54	Heroin and alcohol	0.056	Morphine 0.29mg/L Alcohol 153mg/L
55	Amitriptyline and methadone	0.06	Amitriptyline 1.3mg/L Methadone 1.8mg/L
56	Methadone, morphine and alcohol	0.06	Methadone 0.08mg/L Morphine 0.04mg/L Alcohol 112mg/dL
57	Heroin	0.06	Morphine 0.17mg/L
58	Amitriptyline and methadone	0.067	Amitriptyline 2.4mg/L Methadone 1.4mg/L
59	Heroin and methadone	0.07	Morphine 0.26mg/L Methadone 0.41mg/L
60	Heroin and cocaine	0.07	Morphine 0.49mg/L Benzoylecgonine >0.50mg/L
61	Heroin	0.07	Morphine >1mg/L
62	Methadone, heroin and dihydrocodeine	0.08	Methadone 0.15mg/L Morphine <0.025mg/L Dihydrocodeine 1.6mg/L
63	Methadone	0.08	Methadone 0.57mg/L
64	Heroin	0.087	Morphine 0.32mg/L
65	Morphine and amitriptyline	0.09	Morphine 0.17mg/L Amitriptyline 0.75mg/L

66	Multi-drug toxicity	0.09	Amphetamine 0.11mg/L Methadone 0.38mg/L Dihydrocodeine 0.73mg/L Diazepam 0.12mg/L
67	Methadone	0.09	Methadone 0.15mg/L
68	Methadone	0.10	Methadone 1.9mg/L
69	Tramadol, methadone and morphine	0.10	Tramadol 6.6mg/L Methadone 12mg/L Morphine 0.04mg/L
70	Dihydrocodeine	0.13	Dihydrocodeine 16mg/L
71	Dihydrocodeine and codeine	0.14	Dihydrocodeine 5.7mg/L Codeine 0.73mg/L
72	Alcohol	0.16	Alcohol 503mg/dL
73	Heroin and methadone	0.16	Morphine <0.025mg/L Methadone 0.09mg/L
74	Codeine and alcohol	0.16	Codeine 2.4mg/L Alcohol 258mg/dL
75	Multi drug toxicity	0.17	Methadone 1.8mg/L Dihydrocodeine 0.79mg/L Olanzapine 0.13mg/L
76	, Butane	0.18	Butane 3.3 mg/L Isobutane 0.36 mg/L Propane 1.7 mg/L
77	Buprenorphine	0.19	Buprenorphine 72 ng/mL
78	Methadone	0.20	Methadone 0.42mg/L
79	Heroin	0.23	Morphine 0.28mg/L
80	Heroin	0.42	Morphine 0.03mg/L
81	Dihydrocodeine and amphetamine	0.46	Dihydrocodeine 6.3mg/L Amphetamine 3.1mg/L
82	Heroin	0.47	Morphine 0.26mg/L
83	Methadone and morphine	Present	Methadone 1.3mg/L Morphine 0.03mg/L

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).

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



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 pathologist in deciding how integral this drug was to the cause of death.

It is hoped that this series of data will be of some assistance in determining whether or not phenazepam has played a significant role in an individual's death.

In our series, the two cases where the highest levels of phenazepam were present (1.2 and 1.6mg/L) were the cases that phenazepam was considered to be the sole cause of death. These cases did have other drugs present, albeit at low levels; however given the high level of phenazepam present, it was

felt that it alone would account for death. Interestingly one of these cases occurred prior to the drug being criminalised and the after the legislation was introduced.

There were 54 cases where the cause of death was drug related and phenazepam was included in the cause of death along with one or more other drugs. The level of phenazepam noted in these cases ranged from <0.005-0.9mg/L (median 0.10 mg/L), many being significantly lower than that seen in the two cases where the drug was considered as the only cause of death. In 13 of these cases (24%), methadone was the only other drug stated in the cause of death and the levels of this drug present varied from 0.8-1.1mg/L. A further 29 cases (54%) had phenazepam, methadone plus one or more other drugs in the cause of death. Interestingly, of the 83 cases where phenazepam was present but not included in the cause of death, the range of phenazepam present was not dissimilar (0.005-0.46mg/L) but the median of the concentration was half at 0.05 mg/L. In this cohort there were 9 methadone only deaths, with the level of this drug present ranging from 0.15-1.1mg/L. Obviously, each case has to be assessed individually taking into account the circumstances surrounding the death and drug tolerance, but it would appear that there is a degree of reporting variability which will at least partly be related to the lack of evidence available to the forensic pathologist when attempting to attribute cause of death in these cases.

Alcohol is a drug that is present frequently in drug related deaths. In 9 of the 54 cases where phenazepam was included in the cause of death, alcohol +/- other drugs were also present (range 56-333mg/dL) (median 213mg/dL). When phenazepam was not included in the cause of death, 15 cases named alcohol +/- other drugs as playing a role the death (range 112-503mg/dL) (median 252mg/dL). Again the concentrations of alcohol recorded in cases where phenazepam is and is not included in the cause of death was similar indicating differing practices in reporting these cases.

In a high proportion of the cases, morphine was detected (most with heroin metabolites). In 18 of the cases where phenazepam was included in the cause of death morphine was found (range <0.025-0.59mg/L) (median 0.23mg/L). Almost half of the cases where phenazepam was present, but not included in the cause of death, also showed the presence of morphine (range <0.025- >1mg/L) (median 0.27mg/L). Some of these cases did show morphine present at a higher level, but there was a reasonable number that showed a similar concentration of the drug as that seen in cases where phenazepam was not included in the cause of death.

A number of other drugs were also identified, the majority in cases where phenazepam was and also was not included in the cause of death. Again the concentrations of these drugs in both types of death were very similar and it has to be assumed that the variability in the reporting of the case by the pathologist is due to the background circumstances of the case and/or the lack of available evidence base.

Notably 89 cases were identified where phenazepam was detected, but definitively did not play a role in causing death. Numerous other causes of death were reported in these cases including hanging, ischaemic heart disease and trauma-related deaths. A high proportion of these cases (30%) were death due to hanging and the phenazepam concentration noted in these deaths ranged from <0.05-0.39mg/L (median 0.09mg/L). Ischaemic heart disease was the second commonest cause of death in these cases (range 0.05- 0.1mg/L) (median 0.04mg/L). The ranges and medians in these cases, in particular those related to ischaemic heart disease, is not dissimilar to those recorded in the cases where phenazepam was present but not included in the cause of death. In contrast, albeit the

case number is lower, the median in the cases where phenazepam was included in the cause of death is almost identical to that is the deaths due to hanging. This suggests that again each case has to be looked at individually, especially with regards to the circumstances surrounding death.

Care should be taken when comparing statistics from different areas due to differing practices between pathologists and the in-house data available to aid the pathologist in making a decision about the drugs named in the cause of death. In addition, it should be noted that two different toxicology laboratories were used in the testing of these cases. The limits of detection and quantification were similar; however, testing for phenazepam began at slightly different times, namely October 2010 (East) and December 2010 (West). Another consideration is that the additional drugs tested for and detected were case and laboratory specific, and not necessarily consistent throughout all cases.

The main purpose of this paper was to correlate data that hopefully will be of benefit to those who are attempting to decide if phenazepam should or should be included in the cause of an individual's death. It is clear that, based on the cases where phenazepam has been detected and was or was not included in the cause of death, there is a variation in how these deaths are reported and it is likely one of the main reasons for this is the lack of any available evidence base to date.

No conflict of interests are declared.

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