Opiate-related deaths in Dublin

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Abstract

Background Intravenous drug misuse, principally heroin, occurs primarily in the Grater Dublin area. Methadone maintenance treatment has been an important part of the response to opiate misuse in Dublin since 1992.

Aims To determine the number of opiate-related deaths in Dublin City and Country during 1999, to establish the number of methadone-related deaths and determine the proportion of deaths associated with methadone prescribed according to guidelines.

Methods A retrospective review of all coroners' inquest files in Dublin City and County during 1999 was undertaken.

Results There were 84 opiate-related deaths. Seventy-eight (92.9%) were male. Seventy-three (86.9%) had two or more drugs identified toxicologically. There were 45 methadone-related deaths, of which 15 (33.3%) were receiving methadone prescribed according to guidelines.

Conclusion Opiate-related deaths occur primarily in males in the 25-34 year age group and are associated with a high level of polydrug use. Diverted methadone accounted for the majority of deaths involving methadone.

Introduction

The reported number of drug-related deaths in Ireland in the 1990s is increasing faster than in any country in the European Union.[1] Most involve opiate, which are an important cause of premature mortality.[1,2]

Methadone maintenance treatment in associated with reduced mortality among opiate addicts,[3,4] and has been a major part of the response to heroin use in Dublin since 1992. However, like heroin, a methadone overdose in dangerous.[5] Diverted methadone contributes to 50% of opioid-related deaths in England and Wales.[2]

In Ireland, heroin use occurs predominantly in Dublin and consequently this study was undertaken in this region. This study examined all inquest files for deaths in Dublin City and Country during 1999 documenting inquests for drug-related deaths, recording the demographic distribution of these deaths, and determining the number related to methadone and those to diverted methadone.

Methods

Unexpected, unexplained and unnatural deaths are reported to the coroner. Two coroners have responsibility for the investigation of all such deaths in Dublin City and Country. The files of all inquests carried out in this region during 1999 were examined. These files contain police reports, witness statements, autopsy reports and toxicological analyses. A standardized data collection form was developed to record information on demographic characteristics, circumstances of death, toxicological findings and history of drug use.

Information on results of toxicological analysis was obtained from reports of analyses of blood, urine and other tissue specimen taken at autopsy. Information on history of drug misuse was obtained from depositional information such as known history of opiate misuse, circumstances of death or a history of treatment for dependence. Information on history of admission to methadone maintenance treatment was obtained from the Central Methadone Treatment List. In describing the cause leading directly to death, the lowest line on the coroner's certificate (part 1) which described the underlying pathological cause of death was used. The cause of death was coded using the ninth revision of the International Classification of Diseases (ICD-9).[6] The data collection was carried out between January and June 2000. Data were analysed using Epi Infor version 6.1.[7]

Results

There were 732 inquests carried out in 1999, 462 by the Dublin City coroner and 270 by the Dublin Country coroner. Ninety-six (13.1%) were identified as drug-related deaths. As five occurred in people with addresses outside Dublin they were not included in subsequent analysis. An additional seven drug related deaths were non-opioid deaths. Thus, the total number of opiate-related deaths in the region was 84.

Demography

Victims ranged in age from 17 to 48 years (mean 30.3 years). There were 78 (92.9%) male deaths and six (7.1%) female deaths (see Table 1). There areas of residence of the victims were coded to their District Electoral Division. In all, 63 District Electoral Divisions had at least one death. The areas with three or more deaths per District Electoral Division were Merchants Quay F, Ballymun C, Crumlin D, and both Fetercairn and Jobstown in Tallaght.

Table 1. Age and sex of opioid-related deaths in inquests in Dublin in 1999 and death rate per 100,000

Age group	Males No	Rate/ 100,000	Females No	Rate/ 100,000	Total No
15-24	25	25.8	1	1.0	26
25-34	29	34.4	4	4.4	33
35-44	20	28.8	1	1.3	25
45-54	4	7.1	0	0.0	4
Total	78	-	6	-	88

Classification of deaths

The types of evidence used to classify deaths as drug-related are presented in Table 2.

Toxicological findings

Toxicological examination was performed on 82 (97.6%) victims. Methadone and/or morphine were detected in 72 (85.7%) at autopsy. The second most frequent class of drug were benzodiazepines which were detected in 52 (61.9%) victims, with alcohol in 26 (30.9%). Cannbis, codeine, cocaine, amphetamines and ecstasy were detected in 14 (16.7%), 14 (16.7%), 8 (9.5%), 2 (2.4%) and no victims, respectively.

Two or more drugs were identified by toxicological analysis in 73 (87%) victims (see Table 4). Of the nine cases where there was one drug identified, heroin and methadone were identified in two (2.4%) and one (1.2%) case respectively. In the remaining six (7.2%) cases, alcohol or benzodiazepines only were identified. In these cases and the two in which there were no drugs identified by toxicology, there was adequate depositional information to designate the death as opiate-related.

The cause of death was coded as drug dependence in 75% of deaths, but there was a substantial minority of deaths caused by violence (see Table 3).

Source of methadone

The ‘Misuse of Drug (Supervision of Prescription and Supply of Methadone) Regulations’ was introduced on 1 October 1998. From this date, in effect, methadone could only be dispensed to people who were on the Central Methadone Treatment List. Fifty-two (61.9%) opiate-related deaths occurred after this date.

The proportion of methadone-associated deaths in people on prescribed methadone declined from 38% before the introduction of the new regulations to 29% after the introduction of the regulations, although this decline was not statistically significant (see Table5).

Of the deaths which occurred after the introduction of the Methadone Regulations, eight (17.8%) had previously been on the Central Methadone Treatment List, while nine (20%) had never been on the Central Methadone Treatment List. The corresponding number of deaths which occurred prior to the introduction of these regulations on the prescribing of methadone were four (8.9%) and nine (20%).

The source of this diverted methadone was not documented.

The mean time on the Central Methadone Treatment List prior to death for those who died while receiving methadone prescribed according to guidelines was 44 weeks (range 1-248 weeks).

Table 2. Type of evidence used in classifying death as opioid-related

Evidence	Number	Percentage
Death certificate + toxicology + depositional	61	72.6
Death certificate + depositional	4	4.8
Toxicology + depositional	10	11.9
Depositional only	9	10.7
Total	**84**	**100.0**

Table 3. Cause of death (ICD-9) as recorded on death certificate

Description	ICD code	No (%)
Drug dependence	304.0-304.9	63 (75)
Poisoning by opiates and related narcotics	965 (.0, .01,.02,.09	2 (2)
Violent and accidental (hanging, gunshot wound, falls etc)	994.7, E922.0, E888	13 (16)
Miscellaneous (not established, vasculitis, alcohol dependence, liver disease)	799.0, 447.4, 303.0571	6 (7)
Total		**84 (100)**

Table 4. Number of drugs implicated in each drug-related death

Number of drugs	Frequency	%
0	2	2.4
1	9	10.7
2	32	38.1
3	25	29.8
4	15	17.9
6	1	1.2
Total	**84**	**100.1**

Table 5. Relationship between date of death and the methadone status of all methadone-positive deaths

Date of death	Currently on Central Methadone Treatment List	Previously or never on Central Methadone Treatment List	Total
After methadone regulations	7	17	24
Before methadone regulations	8	13	21
Total	**15**	**30**	**45**
Chi-square = 0.4; d.f. = 1; p>0.5			

Discussion

In this study, opiate-related deaths occurred overwhelmingly in males. Similar results have previously been reported for heroin related deaths in other countries.[8,9] The five areas with three or more deaths were all in local drug task forces areas, which were established to provide a co-ordinated response to the drug problem at a local level.

A striking finding from the toxicological data is the very small number of deaths, three (3.6%), in whom methadone or heroin alone was identified. Most people died with two or more drugs in their system, with benzodiazepines being identified in over 61% of cases and alcohol in almost one-third. Both of these drugs act as central nervous system depressants and can enhance and prolong the depressant effects of opiates.[9]

Forty-five (53.6%) opiate-related deaths in this study were associated with methadone. This has to be seen in the context of increased risk of death for addicted heroin users, which is 20 to 30 times higher than in the general population of the same age.[10] From mid-1998 to mid-1999 (the period in which most of the deaths occurred), 1,369 new patients were entered on the Central Methadone Treatment List. Studies in several countries have consistently shown that methadone maintenance treatment reduces heroin use and criminal activity. It is also associated with a substantial reduction in mortality.[3] Concerns have been expressed about a dramatic increase in fatal methadone deaths, particularly in the UK. However, a large recent study in England and Wales did not support such concerns.[5]

The actual contribution of methadone to methadone-positive deaths is difficult to determine accurately. The fatal concentration varies widely with tolerance and the blood concentration increases after death.[11] A further factor confounding interpretation is that blood methadone concentrations at different sites at necroscopy may differ by three times in a single subject and that no relation exists between the concentrations at different sites.[12]

The risk of fatal methadone toxicity is greatest in the first two weeks of admission to a methadone maintenance programme. The risk later in maintenance is estimated at approximately one hundredth this risk. This ‘danger period’ is associated with the difficulty in determining a safe and effective dose.[5] This study did not demonstrate a higher mortality in the early stages of the maintenance programme, possibly due to appropriate prescribing and supervision of new addicts.

The use of methadone by persons other than those to whom it has been prescribed is a concern. The change in the practice of methadone prescribing, in operation since 1 October 1998, should reduce the number of deaths in methadone users. However, this study would need to be repeated to verify this. The drug history of methadone-related deaths is often unavailable. However, diverted methadone is usually bought by heroin users to manage withdrawal symptoms. Ensuring that take-home doses are only dispensed to patients who have responded well to treatment can reduce methadone diversion.[3] Methadone diversion continued in the immediate aftermath of the new regulations.

Although not originally intended for epidemiological research, death certificate review is useful in obtaining demographic and epidemiological data.[13] Limitations to the use of coroners’ records include the fact that they depend on appropriate referral of cases and records are limited to subjects who die within the catchment area.[11] Deaths due to opiates occurring in Dublin residents, but who die elsewhere, are not including in this study. Coroners vary in their practice of obtaining toxicological information in suspicious deaths and in how such deaths are classified.[2] In the Dublin area, toxicological samples are usually submitted to the hospital laboratory in which the victim dies. Subsequently, further analysis and estimation of the quantities of opiates is performed at the State laboratory.

In conclusion, this study found that the majority of opioid-related deaths were in young males and involved benzodiazepines or alcohol co-abuse. Deaths due to opiate overdose are potentially preventable. Education on the hazards of polydurg use to heroin users may help reduce these deaths.

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