

Deaths of drug addicts in the United Kingdom 1967-81

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Abstract

A search of the Home Office index of notified drug addicts identified 1499 deaths during 1967-81, of which 226 (15%) were of therapeutic addicts—that is, patients who had become addicted during medical treatment with a notifiable drug—and 1273 (85%) were of non-therapeutic addicts. The crude mortality fell from 23.5/1000/year for the period 1968-70 to 18.4/1000/year for 1978-80. Altogether 416 addicts aged under 50 at notification died after 1972, which was 16 times the number of deaths expected in a population with a similar age and sex composition. A more detailed examination of the cohorts of addicts notified each year showed little variation between them in the first two years of follow up. Nineteen addicts (1.6%) had died by 31 December of the year of their notification and 39 (3.3%) one year later. These figures may be an indication of the clinical course of addiction. Most deaths of non-therapeutic addicts in which a drug was implicated (939 cases (74%)) were due to medically prescribed drugs—barbiturates at first and later opiates such as dipipanone hydrochloride and dextromoramide. Heroin was implicated in only 65 (7%) of these deaths.

The Home Office index is a valuable source for identifying drugs of abuse and serious problems of addiction. The fact that prescribed drugs are causing the death of so many addicts demands a response from the medical profession.

Introduction

At a time of increasing concern about illicit importation of heroin into the United Kingdom and about the apparently epidemic nature of use of heroin by young people in certain localities it seemed appropriate to review recent experience of opiate dependence in the United Kingdom. To study deaths of addicts may, at first sight, seem unhelpful—rather like shutting the door after the horse has bolted. Mortality studies, however, are recognised internationally as useful investigative tools for indicating trends in addiction to drugs.¹⁻⁵ Taken in isolation the results may be of limited value, but taken in conjunction with those of other studies—for example, of prescribing trends or problems related to drugs in accident and emergency departments—they give a more complete picture of drug taking behaviour and drug dependence, and, by definition, mortality studies provide data about the most serious forms of drug addiction—that is, those from which the addict has died.

A useful source of information in the United Kingdom is the Home Office index of addicts. Before 1968 this was based on a system of voluntary notification by medical practitioners and of

inspecting the books of dispensing chemists. Since the introduction in 1968 of the Dangerous Drugs (Notification of Addicts) Regulations, however, medical practitioners have had a statutory duty to notify the Home Office of any addict whom they attend; the current index of addicts is derived from these notifications. The Home Office also keeps a separate list of those addicts removed from the current index by reason of death, though there are no statutory obligations requiring that the Home Office should be informed of an addict's death; the information is derived from the returns made every two months by drug dependence treatment clinics to the Home Office and from information from coroners' courts, police, etc.

The usefulness, completeness, and representativeness of the Home Office statistics have been the subject of much discussion and some investigations.¹⁻⁶ Though the statistics are incomplete and probably unrepresentative, they undoubtedly provide useful information about a large number of addicts, and this valuable source of data should not be ignored. We therefore examined, in some detail, the file of deaths of addicts during 1967-81. The starting date of 1967 was chosen because that was the year that the Dangerous Drugs Act was passed and the treatment of drug dependence in the United Kingdom changed direction.⁷ Drugs had been easily obtainable to therapeutic addicts but with a rise in non-therapeutic addiction, restrictions on prescription and on addicts developed.

Method

The Home Office index of addicts who had died was searched and the records of notified addicts who had died from 1967 to 1981 examined. Data were extracted in a standardised manner without revision. The search was carried out twice: once in 1979-80 and again in 1982. In the second search a few additional cases were identified, but none of these deaths had occurred more than four years previously. This implied that notification of death was sometimes delayed, and though the figures for 1980 and 1981 may have been incomplete, those for earlier years were reasonably accurate.

The information obtained was transferred to a specially designed, precoded inventory for statistical analysis. To preserve confidentiality names were not transferred.

Results

NUMBER OF DEATHS

The total number of deaths of addicts during the 15 year study was 1499, and table I shows their annual distribution. The top line of the table shows the number of deaths as derived from the official Home Office statistics that are published yearly. The discrepancy between the published numbers of deaths and those shown by a search of the index amounted to 617 over the 15 years.

THERAPEUTIC AND NON-THERAPEUTIC ADDICTS

Sex—The index card for each addict indicated whether he or she was a therapeutic addict—that is, someone who had become addicted during medical treatment with a notifiable drug. Of the 1499 deaths, 1273 were of non-therapeutic addicts, and the number of non-therapeutic male addicts who died each year consistently outnumbered that of female addicts (fig 1). The average ratio of men to women was 3.5:1. The number of deaths each year of therapeutic addicts remained fairly steady from 1967 to 1981, with a total of 99 men and 127 women dying (ratio 1:1.3).

Age at death—As well as the differing sex distribution there were also

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TABLE I—Deaths of notified addicts in United Kingdom 1967-81 and sources of information

| | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total |
|---------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Official Home Office statistics | 37 | 47 | 64 | 74 | 58 | 65 | 61 | 77 | 68 | 63 | 40 | 60 | 49 | 73 | 46 | 882 |
| Present study | 51 | 65 | 82 | 81 | 78 | 106 | 101 | 114 | 130 | 114 | 102 | 130 | 125 | 129 | 91 | 1499 |

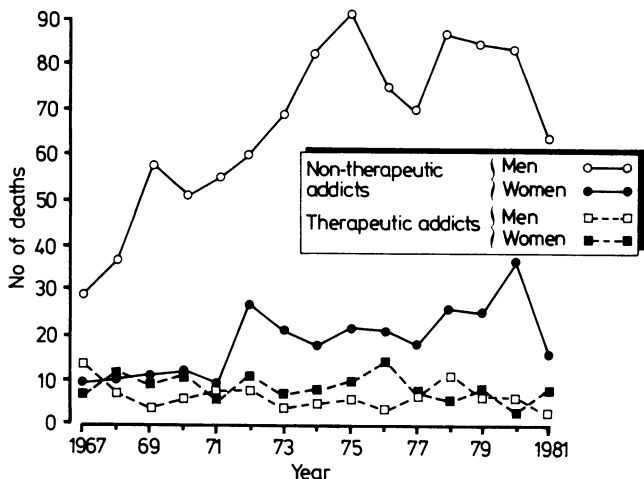


FIG 1—Deaths of notified addicts, 1967-81.

clear differences between therapeutic and non-therapeutic addicts in terms of their age at death. Over half of the therapeutic addicts were aged 50 or more when they died compared with only 5% of the non-therapeutic addicts, two thirds of whom were aged under 30 (table II).

TABLE II—Age and sex of notified addicts who died 1967-81 (n=1499)

| Age (years) | Non-therapeutic addicts | | | Therapeutic addicts |
|-------------|-------------------------|-------|------------|---------------------|
| | Men | Women | Total (%) | |
| Under 20 | 52 | 17 | 69 (5.4) | 3 |
| 20-24 | 316 | 76 | 392 (30.8) | 3 |
| 25-29 | 311 | 88 | 399 (31.3) | 2 |
| 30-34 | 146 | 34 | 180 (14.1) | 4 |
| 35-39 | 48 | 13 | 61 (4.8) | 4 |
| 40-44 | 18 | 8 | 26 (2.0) | 3 |
| 45-49 | 17 | 5 | 22 (1.7) | 7 |
| 50 and over | 40 | 26 | 66 (5.2) | 125 |
| Not known | 44 | 14 | 58 (4.6) | 78 |
| Total | 992 | 281 | 1273 (100) | 226 |

Interestingly, 10% of the addicts who died in 1967 and 1968 and 17% of those who died in 1969 were under the age of 20. By the early 1970s a smaller proportion (6%) of deaths occurred before the age of 20, and by the late 1970s and early 1980s only 2% of deaths occurred in this age group. During this period about 20% of addicts were aged 20-24 and about 30% were aged 25-29 at the time of death. Thus over the 15 years of the study there was clear evidence of a trend towards addicts dying at an older age.

TABLE III—New addicts notified from 1967 to 1981 and mortality among successive cohorts

| | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | Total |
|---|------------|------------|------------|---------|----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|
| New notifications | 799 | 1476 | 1030 | 711 | 774 | 800 | 807 | 870 | 922 | 984 | 1109 | 1347 | 1599 | 1600 | 2248 | 17 076 |
| Deaths among addicts notified after 1966 | 15 | 39 | 58 | 58 | 65 | 80 | 70 | 102 | 102 | 109 | 105 | 117 | 109 | 113 | 40 | 1182 |
| Cumulative notified population* | 784 | 2221 | 3193 | 3846 | 4555 | 5275 | 6012 | 6780 | 7600 | 8475 | 9479 | 10 709 | 12 197 | 13 684 | 15 892 | |
| Duration of follow up (years) | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | |
| No (%) of new notifications who died during study | 115 (14.4) | 235 (15.9) | 118 (11.5) | 71 (10) | 68 (8.8) | 70 (8.8) | 82 (10.2) | 85 (9.8) | 76 (8.2) | 61 (6.2) | 61 (5.5) | 43 (3.2) | 59 (3.7) | 27 (1.7) | 11 (0.5) | |

*New notifications minus those who died.

DRUGS IMPLICATED IN DEATHS

Drugs caused, or were implicated in, the deaths of 939 (74%) non-therapeutic addicts, but the drug was identified in only 745 cases. Figure 2 shows the number of deaths each year according to the drug that was used, and hence the changing importance of the drugs. Heroin was implicated in the smallest number of deaths: only 65 during the 15 year study. Barbiturates were implicated in 287 deaths and were particularly important in the early and mid-1970s. The most recent development was the use of other opiates, which were implicated in 141 deaths, 100 during the last five years. The 107 deaths in which methadone was implicated showed comparatively little fluctuation from year to year.

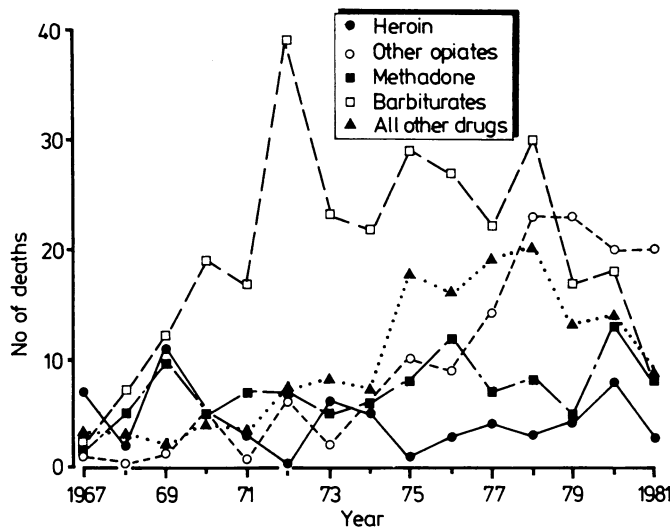


FIG 2—Drugs responsible for deaths of notified addicts, 1967-81.

ANNUAL MORTALITY

Table III shows the annual distribution of deaths of addicts first notified during or after 1967 and the cumulative totals of notifications to give an idea of the population of notified addicts after 1967. These figures do not take into account other reasons for coming off the index of addicts, such as imprisonment, abstinence, or leaving a treatment agency, but from 1967 to 1981 a total of 17 076 addicts were newly notified, of whom 1182 (6.9%) were dead by the end of 1981.

By relating the numbers of deaths of addicts notified to the Home Office to the total years of notification (years at risk) we were able to calculate crude mortalities for periods from 1967 to 1980. Of the addicts notified during the first three years after the clinics opened (1968-70), 126 died giving a ratio of 126:5360, or 23.5/1000/year of whom 21.5

were non-therapeutic addicts. Of the addicts notified during the last three years of this period (1978-80), 117 died giving a ratio of 117:6368, or 18.4/1000/year, of whom 17.1 were non-therapeutic addicts.

ANNUAL COHORTS

The cohort of addicts notified each year was also examined separately to establish the number of deaths at the end of successive calendar years and to calculate the mortalities among successive cohorts. Table III and figure 3 show that 1.9% of addicts notified during 1967 were dead by 31 December of that year (within one year of notification), 3.5% by the end of 1968 (within two years), and so on. There was little difference between successive cohorts for the first two years of follow up. After 1973, however, there appeared to be a steady fall in the mortality among successive cohorts during the third, fourth, and fifth calendar years of follow up. The mean percentage mortality for each year of follow up was 1.6% in the first year; 3.3% in the second; 4.7% in the third; 6.0% in the fourth; and 7.5% in the fifth.

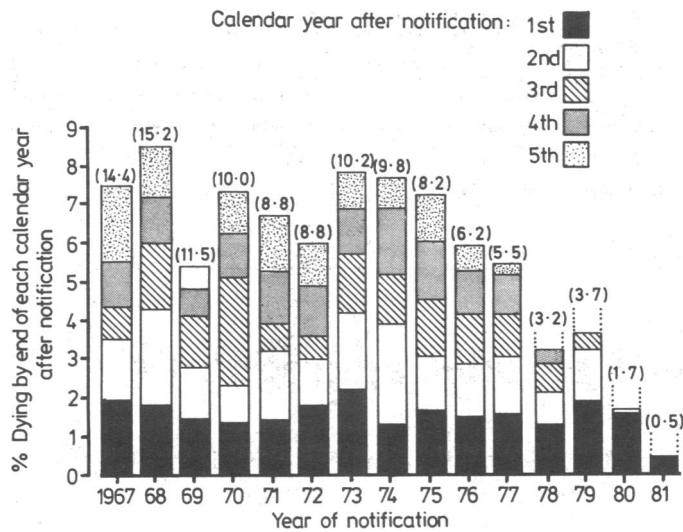


FIG 3—Mortality among cohorts of addicts notified each year. Figures in parentheses are percentages of each annual cohort dead at follow up (1982).

Discussion

Before discussing the results of this study and their implications we would emphasise that the information refers only to addicts known to the Home Office and is not necessarily applicable to others, and that all notified addicts who died from 1967 to 1981 were included whatever the cause of their death.

The discrepancy between the number of deaths of addicts shown by the search of the index of deaths and the number reported in official Home Office statistics was unexpected. How could there be any dispute about such an indisputable diagnosis? In fact, the Home Office states precisely what its figures are—namely, “the number of addicts removed from the index by reason of death”; they do not include those addicts removed from the list for any other reason—for example, if they stop attending a drug dependence treatment clinic and are no longer included on the returns every two months—even if they subsequently die while addicted to drugs. Such an addict would be included in the statistics under another heading: “removed from the index for other reasons.” The published statistics about deaths of addicts are therefore limited in their meaning and are misleading if the method of their compilation is not fully understood. Nevertheless, they are often used in the analysis of trends in addiction both nationally and for international comparisons.

Although the sex distribution of addicts who died again showed the longstanding preponderance of men among non-therapeutic addicts, there was clear evidence over the 15 years of a trend towards addicts dying at an older age. One possible interpretation

of this, of a static but aging population of addicts, is contradicted by the large number of new notifications each year. The mean age at notification also increased, however, particularly from 1973 to 1979, after which it remained more or less constant. Whether an older age at notification implies a longer period of drug abuse before notification or just a later start cannot be deduced from this study.

Perhaps the most important aspect of this inquiry was the opportunity to study so many annual cohorts of addicts, and the fairly constant early (first and second year) death rates for these cohorts over such a long period are of great interest. The 15 year study encompassed a range of different enthusiasms and policies for treating addiction: in the early years clinics opened and started prescribing heroin; then injectable methadone was substituted, and then oral methadone. Clinics have recently become more reluctant to prescribe opiates and may do so only as part of a therapeutic contract. None of these measures seems to have had any impact on early mortality, and the uniformity of the results over 15 years suggests that these death rates are perhaps the elusive “natural history” of addiction. In other words, just as x% of patients with carcinoma of the stomach die within five years after notification so 1.6% of addicts die within one calendar year after notification, 3.3% within two years, and so on. Interestingly, this 3.3% is nearly identical with the comparable figure calculated by Bewley *et al* for a 1965 cohort before the clinics opened.⁸

We should perhaps point out that the choice of calendar years for follow up periods was dictated by the system used at the Home Office for collecting and recording data. In fact, some addicts who were dead by the end of the calendar year in which they were notified may have been known to the Home Office for only a few weeks before death. The true death rate for the first year therefore approaches 3%, for the second year 1.9%, and for the third year 0.7%.

The apparent reduction in mortality over the longer periods of follow up from 1974 onwards is encouraging. The cause cannot be ascertained from this study, but one factor may have been the reduced availability of barbiturates. By this time too the clinics, which in the early years had been feeling their way, were becoming more settled and new treatment and rehabilitation policies were more effective. Evidence suggests that the outpatient clinic system in the United Kingdom contributes to a higher incidence of abstinence than elsewhere.⁹ Further evidence of the downward trend in mortality comes from the figures for crude mortality. Using data from a similar inquiry carried out by Bewley *et al* in 1968⁸ it is possible to calculate that the mortality in 1964-6 was roughly 29/1000/year, falling, as we showed in this study, to 23.5/1000/year in 1968-70 and to 18.4/1000/year in 1978-80.

We were unable to compare the observed number of deaths in 1967-80 with the number that would be expected in a non-addicted population as formerly the Home Office did not publish figures on the age and sex composition of notified addicts. Since 1973, however, it has done so, and 470 addicts died between January 1973 and December 1981. The expected number from a general population with the same age and sex composition would be 39, a ratio of about 12:1. These figures, however, are heavily influenced by the over 50 age group, for which the Home Office data gave no further details. If we make the crude assumption that notified addicts who are aged over 50 are therapeutic addicts and exclude them from calculations there were 416 deaths of notified addicts, whereas the expected number of deaths for a similar population would be 26 (ratio 16:1). The often quoted ratio from the study of Bewley *et al* was 28:1,⁸ but it is not clear how their figures for observed mortality were derived.

Throughout the 15 year study there was anxiety and publicity about illicit heroin imported at different times from different places, such as the “golden triangle” of South East Asia, post-revolutionary Iran, and, latterly, north west Pakistan. Interestingly, heroin had a role in only 7% of the deaths in which a drug was implicated, and some of this heroin may have been medically prescribed rather than illicitly imported. In contrast, most deaths

of addicts in which a drug was implicated were due to medically prescribed drugs: barbiturates in the earlier years of the study and more recently "other opiates," mostly dipipanone hydrochloride and dextromoramide. This in no way minimises the problem presented by illicitly imported drugs. Their easy availability may provide the stepping stone into drug abuse and addiction for a large number of young people, and it is essential that as far as possible these drugs should be kept out of the country.

These findings are not confined to the deaths of notified addicts as they are similar to the results of studies carried out in coroners' courts into deaths due to addiction. In one such study 41% of the deaths were of addicts not known to the Home Office.¹

By definition, mortality studies deal with the most serious forms of addiction, from which the patient dies. What is apparent from our findings is that prescribed drugs rather than illicitly imported drugs are at the core of this aspect of the problem. Far from being a new phenomenon, prescribed drugs have always played a large part in addiction in Britain, and this may be the inevitable consequence of a medical, rather than a criminalising, response to addiction. Whatever the underlying reasons, the fact that prescribed drugs are causing so many deaths of addicts demands a response from the medical profession from whom these drugs originate. An active system of monitoring is the first requirement to identify new drugs of abuse before they have become entrenched in the black market.

This study has shown the value of one particular source of information, the Home Office index, in investigating and identifying serious problems of addiction.

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Epidemiological characteristics of platelet aggregability

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Abstract

The epidemiological characteristics of platelet aggregability were established in 958 participants in the Northwick Park Heart Study. The main analyses were based on the dose of adenosine diphosphate at which primary aggregation occurred at half its maximum velocity. Aggregability increased with age in both sexes, was greater in whites than blacks (particularly among men), and tended to decrease with the level of habitual alcohol consumption. Aggregability was, however, greater in women than men and in non-smokers than smokers. There was no relation between aggregability on the one hand and obesity, current or past oral contraceptive use, menopausal state, or blood cholesterol and triglyceride concentrations on the other. Aggregability was somewhat, though not significantly, higher in men with a history of ischaemic heart disease and in those with electrocardiographic evidence of ischaemia than in those without. There was a strong association between the plasma fibrinogen concentration and aggregability.

The widely held concept of platelet aggregability and its implications is probably an oversimplification. In the prevention of thrombosis it may be as useful to consider modifying external influences on platelet behaviour, such as plasma fibrinogen concentration or thrombin production, as it is to rely solely on platelet active agents.

Introduction

The role of platelets in thrombosis has been the subject of numerous studies for many years, especially over the past two decades. There is, however, no established measure of in vivo platelet function by which those at high risk of thrombosis can be characterised. In 1962 Born described a method for studying platelet aggregation that was based on changes in the optical density of a suspension of platelets.^{1,2} This method, or modifications of it, has since been widely used in laboratory and clinical studies on the assumption that ready aggregability is an index of susceptibility to thrombosis. Here we describe the epidemiological characteristics of platelet aggregability seen in the Northwick Park Heart Study, a prospective study of the role of the haemostatic system in the pathogenesis of arterial disease.

Subjects and methods

SUBJECTS

Fuller details of the Northwick Park Heart Study have been published elsewhere.³⁻⁷ In summary, 3500 participants were recruited

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