Brit. J. Psychiat. (1974), 124, 526–30

Poisoning Cases: Suicide or Accident

By B. M. BARRACLOUGH

The accurate classification of causes of death is fundamental to progress in preventive medicine. Classifying death by poisoning may be specially difficult because the exact distinction between deliberate and accidental poisoning is inherently difficult for the coroner to make. Thus figures for suicidal poisoning are likely to be under-estimated because of ambiguous evidence and because of the stringent legal definition of suicide which coroners must apply. An examination of the drugs involved in poisoning cases, comparing their frequencies in the suicide and accident categories, may throw some light on the validity of coroners' present methods of classifying and provide evidence about the limits of error of under-estimation of the suicide rate.

When someone dies by poisoning the coroner's inquest has to decide, among other matters, how the death is to be classified, as suicide or accident, or whether an open verdict is to be returned.* For suicide, positive evidence of intent is required, and if evidence of intent does not reach the required standard the death is classified as accident or an open verdict is given. The criterion for accidental death, according to the standard *Jervis on Coroners* (7), is as follows: 'Accident would presumably be interpreted in the popular sense as meaning an unlooked for mishap or an untoward event which is not expected or designed'; that for the open verdict decision is 'If there is insufficient evidence to record any of the other suggested verdicts'. In the mortality statistics open verdict poisoning deaths are called, 'Injury undetermined whether accidentally or purposely inflicted'. (8).

Deaths from poisoning classified as accidental should by definition have a strong random element in their cause, and if this is true then the frequency distribution of the drugs causing death should approximate to that of the array of lethal preparations available at home or at work, and therefore should differ from that of drugs used in suicide, where choice will favour the less unpleasant toxic substances available, more especially the psychotropic drugs. This hypothesis will be tested by examining the drugs recorded as the cause of death by poisoning in adults for the years 1968–70.

In England and Wales the names of the drugs causing death are recorded on the death certificates issued after coroners' inquests. Statistics based on these records are compiled by the General Register Office and are published annually, two years in arrears, under the heading of the four 'external' causes of death, namely suicide (E950), accident (E850–869), 'undetermined death' (E980), and homicide (E962) (5). The drugs recorded for the years 1968–70 for deaths of persons aged 15 and over are summarized, using the ICD N-code (11), in Table I. Multiple drug deaths, 10 per cent of the total, were classified according to the first-named in the alphabetical list of two, three, four or five drugs cited (see Appendix).

For the three-year period 8,635 poisoning deaths were recorded, 0·5 per cent of all deaths. Of these, 65 per cent were classified as suicides; the non-suicides were shared equally between undetermined (18 per cent) and accidental deaths (17 per cent).

The frequency distribution of the 27 groups of drugs shows a close resemblance between all three classifications, thus rejecting the hypothesis under test. The proportions of deaths attributed to psychotropic drugs, 83 per cent of suicide deaths, 86 per cent of undetermined deaths and 80 per cent of accidental deaths, is also similar. Psychotropic drugs and analgesics together comprise respectively 94 per cent, 94

* Homicidal poisonings are few; some are decided in the coroner's court, some in other courts and they will not be considered further.

https://doi.org/10.1192/bjp.124.6.526 Published online by Cambridge University Press

TABLE I
Drugs causing death by poisoning 1968–1970

Drug group	I.C.D. N—Code	Suicide N = 5,637		Undetermined N = 1,547		Accident N = 1,451		Non-suicide N = 2,998		Total N = 8,635	
		%	Rank	%	Rank	%	Rank	%	Rank	%	Rank
Anti-diabetic agents	962.3	0·09	20	0·32	17	0·28	21	0·30	21	0·16	20
Systemic agents	963	0·04	23	0·13	22	0·14	25	0·13	25	0·07	26
Opiates and synthetic analogues	965.0	0·69	12	0·52	14	2·48	9	1·47	10	0·96	12
Salicylates and congeners	965.1	9·53	2	6·46	2	3·86	4	5·20	2	8·03	2
Other analgesics and antipyretics	965.2–9	0·71	11	0·97	9	1·45	11	1·20	11	0·88	13
Anti-convulsants	966	0·21	17	0·19	20	0·14	25	0·17	23	0·19	19
Barbiturates	967·0	67·22	1	68·33	1	60·44	1	64·51	1	66·28	1
'Carbrital'	967.0	2·79	5	3·43	4	2·76	7	3·10	4	2·89	5
Other sedatives and hypnotics	967.1–9	2·32	6	3·17	5	2·55	8	2·87	7	2·51	6
Methaqualone	967.9	3·76	4	2·19	7	3·65	5	2·90	6	3·46	4
Antidepressants	970.0	4·19	3	4·65	3	4·55	3	4·60	2	4·33	3
Tranquillizers	970.1	1·84	7	2·26	6	3·24	6	2·74	8	2·15	7
Phenothiazines	970.1	1·31	10	2·19	7	1·86	10	2·03	9	1·56	8
Amphetamines	971	0·05	22	0·06	24	0·48	18	0·27	22	0·13	23
Agents affecting autonomic nervous system	972	0·62	13	0·84	10	1·24	12	1·03	12	0·76	14
Agents affecting cardiovascular system	973	0·02	16	0·45	15	0·34	19	0·40	18	0·29	17
Agents acting on musculo-skeletal system	976	0·09	20	0·13	22	—	27	0·07	27	0·08	25
Ethyl alcohol	980.0	0·04	23	0·32	17	5·72	2	2·94	5	1·04	10
Other alcohols	980.1–9	0·02	26	0·32	17	0·55	16	0·43	17	0·16	20
Industrial solvents	982	0·04	23	0·19	20	0·55	16	0·37	19	0·15	22
Corrosives	983	1·65	8	0·78	12	0·69	15	0·73	14	1·33	9
Lead and compounds	984	—	27	0·06	24	0·28	21	0·17	23	0·06	27
Other metals	985	0·11	18	0·06	24	0·21	23	0·13	25	0·12	24
Cyanide	989.0	1·35	9	0·45	15	0·21	23	0·33	20	0·99	11
Other non-medicinal substances	989.1–9	0·43	15	0·65	13	0·34	19	0·50	15	0·45	16
Other and unspecified	977	0·59	14	0·84	10	1·03	13	0·93	13	0·71	15
Miscellaneous	961, 964, 968, 969, 975, 981, 987, 988	0·11	18	—	27	0·96	14	0·47	16	0·23	18
Psychotropics	967, 970.	83·43		86·23		79·05		82·76		83·19	
Psychotropics plus analgesics	965.967.970	94·36		94·18		86·84		90·63		93·06	
Multiple drug deaths		9·7		11·2		9·8		10·4		9·9	

per cent and 86 per cent of the totals. The only differences of consequence relate to cyanide, almost exclusively suicide, and alcohols, ethanol and methanol, almost exclusively not suicide; but the number of deaths from these poisons is less than 2 per cent of the total.

These exceptions are probably caused by inferences about intent which can be drawn from the drug. The swallowing of cyanide may be enough in itself for the coroner to infer intent. Alcohol deaths, on the other hand, may be genuinely unintentional, or the coroner may

https://doi.org/10.1192/bjp.124.6.526 Published online by Cambridge University Press

consider that the taking of alcohol has impaired the capacity of the subject to form intent, in the legal sense.

Discussion

What explanation can be suggested for this finding of similar fatal 'drug profiles' for suicide and non-suicide poisonings? A coincidence, caused by availability of lethal drugs may be one explanation; that is, the chosen drug of the suicide and the chance encounter with a lethal preparation are both determined by the same factors of availability and lethality, and the stated hypothesis under test is therefore wrong. The other possible reason may be that real suicides are misclassified as 'accidental' or 'open verdict' cases. From the data in Table I there is, of course, no way of telling which is correct; but there are some facts which tend to support misclassification.*

Non-suicide poisoning cases must be largely recruited from homes in which psychotropic drugs are kept. A national random sample of homes showed that only 20 per cent contained 'sedatives, sleeping tablets or tranquillizers' (4). Now 80 per cent of poisonings classified as non-suicide are in fact caused by 'sedatives, sleeping tablets or tranquillizers', and 85 per cent of poisoning deaths classified as accidents occur at home (9). Thus it appears that people who die by 'nonsuicide' poisoning are likely to be living with family members who are taking psychotropic drugs or to be persons who are themselves being treated with such drugs and in this respect resemble the suicides. Further, in each of the three classifications there are similar proportions of deaths from multiple drug poisoning, and 95 per cent of these in each category are from mixtures of psychotropic drugs. It seems reasonable to assume that swallowing more than one drug is a measure of intent to die, and if this is true then these groups officially classified as suicides, open verdicts and accidents are really similar in their intent. Finally, it seems highly improbable that people should swallow, by accident, in the sense that the coroners used the word, the large numbers of tablets required to produce death from drugs which are so safe in clinical practice. Thus the evidence, interpreted with common sense, supports the view that most deaths from poisoning are in reality instances of suicide though they cannot be classified as such by the coroner.

What of the difference between undetermined ('open verdict') deaths and accidental deaths? The statistics of poisoning are the result of the combined deliberations of some 230 coroners, their deputies and their assistants. The definitions for verdicts stated in the coroners' handbook could in practice be interpreted with some variation. But there is evidence that common ground may exist in the interpretation given to the suicide definition (2). The decisions given from time to time by the High Court in cases of appeals (10) against coroners' verdicts on equivocal cases of suicide may serve to reinforce a generally accepted standard.

For open verdicts, on the other hand, evidence suggests that an agreed standard is lacking (2), so that variation may exist in the placing of non-suicide cases in the open verdict or accidental categories. No appeals are recorded relating to the distinction between open verdict and accident verdict, and the distinction drawn in *Jervis on Coroners* leaves more room for subjective interpretation than does the advice given for suicide verdicts: 'It should be noted that an open verdict is thus only to be used in the last resort if there is insufficient evidence to enable the coroner or the jury to reach one of the other verdicts. A coroner should not abnegate his duty of reaching a positive verdict merely because there is some doubt on some minor point. In cases of possible suicide the coroner should remember that suicide should not be presumed, and in the absence of evidence pointing to suicide a verdict of accident (assuming that there is evidence of there having been an accident) may seem suitable. There may, however, be cases in which it is impossible to decide whether the death was an accident or suicide, and in such cases an open verdict is legitimate' (7). Since the open verdict category is the one in which doubtful cases of

* There might also be a small contribution to similarity from the very disturbed suicidal person randomly snatching whatever drug is to hand, and from the psychiatric patient, confused by his disease or his drug, being more prone to accidental overdose.

https://doi.org/10.1192/bjp.124.6.526 Published online by Cambridge University Press

suicide can be placed, it is possible to combine it with the suicide category in order to arrive at a truer estimate of suicide incidence than can be obtained from official statistics. It is important, therefore, that accidental poisonings should be as clearly distinguished in definition as are suicides, and that the category should contain only those cases in which chance did play the major part.

What inferences may be drawn from these observations on poisoning cases about the error in the official suicide rate, and the hypothetical true incidence? There can be no doubt that the incidence of suicide by poisoning is underestimated, but the underestimate must be *less* than the non-suicide death rate from poisoning, since at least a proportion of these are certainly caused by chance factors and are not suicides. The average annual poisoning suicide rate for the population aged over 15, for the years 1968–70, is 48 per million; the average, annual poisoning 'non-suicide' rate is 26 per million. If all the poisoning deaths classed as accident and open verdict were really suicides (which they cannot be) the error in the suicide rate from poisoning would be less than 50 per cent and the error in the suicide rate itself less than 23 per cent. Thus a limit can be set, and the argument sometimes advanced that the 'true' suicide rate is two or three times the official one can be refuted as far as death by poisoning is concerned.

Since in most industrialized countries poisoning is such a common method for suicide, differences between national suicide rates may be affected by variations in procedure for deciding the coding of poisoning deaths. The Scottish enquiry, for example, is directed towards establishing grounds for criminal proceedings, and suicide coding is a by-product; in contrast, the English inquest's purpose is to establish the cause of death (6). In 1968, 70 per cent of all drug poisoning deaths were recorded as suicide in England, but only 56 per cent were so recorded in Scotland. The difference between the official national suicide rates for that year tends to disappear when the difference in coding poisoning deaths is taken into account (1).

A further point of interest concerns the opinions of Douglas (3), which have influenced the writings of sociologists concerned with suicide. His conjectures can lead to a conclusion that the reason why suicide surveys find high proportions of the mentally ill among those who take their own lives is because the coroner's pre-inquest enquiries discover the presence of mental illness and use it to decide on a suicide verdict, 'knowing' that suicide is often preceded by mental illness. Thus the association between illness and suicide may be spurious. If English coroners behaved in this way we should expect to see a disproportionate number of psychotropic drug poisonings, more especially with antidepressants and phenothiazines, in the suicide category, but this is not the case.

Lastly, if we do assume that misclassification is responsible for the similarities in drug profiles, which aspect of misclassification is it? It could be that coroners misapply the rules by using a too stringent definition of suicide so as to spare the feelings of the surviving family. On the other hand coroners are well acquainted with the results of appeals made by insurance companies on the grounds of misclassification of suicides. Besides, coroners are lawyers and without doubt respect the law they administer. It seems unlikely, therefore, that large-scale misapplication of the rules can be the explanation. Perhaps the rules for classifying violent deaths are not suited to the data, at least for medical purposes. The unease expressed by doctors at some open or accidental death verdicts, particularly in cases with histories of mental illness, even when on legal grounds evidence of intent is weak or absent, and the decision therefore correct, is a manifestation of that aspect. Intent may be present but if it is unexpressed or unobserved the coroner cannot make use of it. The medical interest, in other words, is more in the relation between mental disease and violent death in which there is a component of self-infliction than in the results of applying a stringent legal definition to ambiguous evidence. The present classification of deaths from drug addiction seems a useful innovation to further that interest. These deaths can be classified to the I.C.D. code number for that disorder and not as suicide, accident or indeterminate (8). A similar approach might be considered for violent deaths associated with

https://doi.org/10.1192/bjp.124.6.526 Published online by Cambridge University Press

serious psychiatric illness such as alcoholism, schizophrenia and manic-depressive psychosis. Certainly as a first step the mental illness present could be entered on the death certificate, and the resulting mortality statistics published in the Registrar General's Annual Review.

Summary

The distribution of fatal drugs recorded for suicides, accidents and undetermined deaths is similar, with some minor exceptions. The error in the suicide rate by poisoning must be less than 50 per cent and the contribution to the error in the suicide rate from all causes, less than 23 per cent. English coroners do not appear to use their knowledge of the fatal drug in reaching a verdict.

Acknowledgements

I wish to thank the following for useful criticisms: Mr. P. Fayer, Dr. D. Pallis, Miss D. Shepherd, Dr. G. Thurston.

The General Register Office deserve thanks for publishing the poisons analysis in such detail.

References

1. Barraclough, B. (1972) Are the Scottish and English suicide rates really different? *British Journal of Psychiatry*, 120, 267–73.
2. —— (1970) The effect that coroners have on the suicide rate and the open verdict rate, in *Psychiatric Epidemiology* (eds. Hare, E. H., Wing, J. K.). London: O.U.P.
3. Douglas, J. (1967) *The Social Meanings of Suicide*. Princeton U.P., Princeton N.J.; London: Routledge.
4. Dunnell, K. Cartwright K. (1972) *Medicine Takers, Prescribers and Hoarders*, p. 84, Routledge, London.
5. General Register Office (1970, 1971, 1972) Poisoning cases in 1968, 1969, 1970. *Pharmaceutical Journal*, 703, 422, 530.
6. Home Office (1971) *Death Certification and Coroners* (The Brodrick Report). H.M.S.O.
7. *Jervis on Coroners* (1957) pp. 86, 181, 229 (ed. Purchase, W.B., Wollaston, H.W.). 9th edition. London: Sweet and Maxwell.
8. Office of Population Censuses and Surveys. Personal communication.
9. *Registrar Generals Statistical Review of England and Wales for 1970*, Part 1, Medical Tables, Tables 18A. London: H.M.S.O.
10. *The Times*, 31.1.67, re D.
11. World Health Organization (1969) *International Classification of Diseases*, Volume 2. Geneva: WHO.

Appendix

The 10 per cent of deaths associated with more than one drug, psychotropic drugs in 95 per cent of the mixtures, have been classified according to the first-named in alphabetical order of the drugs cited. The alternative, of classifying according to combinations, was rejected because it resulted in frequencies so small as to be useless. Thus the drug which actually caused death may not always be the one used to classify, but as it is impossible to be certain which it is, and in any case the procedure is standard for each of the three groups, valid comparisons may be made. However, it may be argued that the alphabetical method will tend to overestimate deaths from aspirin and barbiturate, because their two initial letters are the first two in the alphabet. As a check on this possibility the mixtures for one year were reclassified using the highest ranking drug in the mixture, the rank being decided from the frequency of single drug deaths. In this new classification there were 2 per cent more deaths in the barbiturate group, balanced by small reductions in the frequency of the other psychotropics. Ranking was unchanged. The chosen method of classification does not, therefore, affect conclusions based on ranking and on the proportions of deaths attributed to psychotropic drugs.

A synopsis of this paper was published in the January 1974 *Journal*.

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(*Received 29 June 1973*)

https://doi.org/10.1192/bjp.124.6.526 Published online by Cambridge University Press