

Nosological Inaccuracies in Death Certification in Northern Ireland

A comparative study between hospital doctors and general practitioners

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SUMMARY

We aimed to audit nosological inaccuracies in death certification in Northern Ireland and to compare performance of hospital doctors and general practitioners. Nosology is the branch of medicine which treats of the classification of diseases. 1138 deaths were registered in Northern Ireland in a 4-week period commencing 3/10/94. 195 of these were either registered by HM Coroners (HMC) or required further investigation by their staff; these cases were excluded from the study. The remaining 943 were analysed for wording and formulation inaccuracies according to the revised notes (1974), Northern Ireland Medical Certificate of Cause of Death. These are issued in book form by the Registrar of Births and Deaths. The commonest inaccuracies in death certification occur in the areas of poor terminology, sequence errors and unqualified mode. One or more inaccuracies were found in 317 (33.6%) of cases. In 13 of these (4%) cases, the inaccuracies were serious enough to warrant referral by the Registrar of Deaths to HM Coroner. The numbers of general practitioners and hospital doctors were recorded, with general practitioners being responsible for 122 (38%) and hospital doctors being responsible for 195 (62%) of inaccuracies.

Conclusions:

Many of these inaccuracies could have been avoided by adherence to simple guidelines which are readily available in the death certification booklet (G.R.O. 20). In Northern Ireland there is also undergraduate teaching on the importance of death certification and the avoidance of undesirable terminology. However, this seems to have had little effect on doctors' abilities to perform this vital task.

INTRODUCTION

Death certification is a vital function of medical practice. Its poor implementation leads to erroneous health statistics, inaccurate data of disease prevalence and, perhaps, uneven allocation of scarce resources as a consequence of imprecise assessments of disease patterns. Distress to relatives can also be caused by use of the phrase "cerebro-vascular *accident*" – the last word often being confused with traumatic death at a time of emotional stress. In other areas

mistakes made are not only semantic but conceptual, hence our preference for the word nosological.

Lack of referral to the coroner of relevant cases is another problem which has been highlighted in this and other studies.^{1,2} A study from Rotherham, England³ reported that the inaccuracies found could have been avoided by adhering to the notes for medical practitioners. In Northern Ireland similar information is contained in booklets of death certificates (G.R.O.20) and we concur with

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the view that most of the errors could have been avoided. In Northern Ireland all medical students graduating from Queen's University in Belfast are taught the subject of forensic medicine in the third academic year. This course includes the topic of death certification and the avoidance of undesirable terms. This seems to have had little effect on either hospital doctors or general practitioners in the performance of this vital task. In many cases there seems to be a fundamental misunderstanding of the purpose of death certification. Since August 1995, the Coroner for Greater Belfast and a consultant forensic pathologist jointly have given a refresher course to newly qualified doctors on the importance of death certification. It will be interesting to see if this has any impact on the death registration patterns in Northern Ireland in the future, though a recent study⁴ suggests that this may not be the obvious answer.

METHODS

The General Register Office in Belfast receives the registration returns for all deaths in the Province from the local Registrar's offices throughout Northern Ireland. A four week period in 1994 commencing 3 October was randomly chosen. During this period a total of 1138 registered deaths were recorded and each of these was examined from the original certificates. Some of these registered deaths (195 in number) had

been investigated or registered by HM Coroners and were therefore excluded from this study.

Of the remaining 943 deaths, 460 were registered by general practitioners and 483 by hospital doctors of various grades. It was not possible to confirm the grade of the hospital doctor, because this information was seldom available on the death certificate. Deaths occurring in hospital were certified by hospital doctors in this study. Also, it was not possible to ascertain if the certificate was signed by a general practitioner except by assuming that if the death occurred in the community, the signatory on the death certificate was a general practitioner.

RESULTS

Of the 943 death certificates examined in this study 626 (66.4%) were acceptable. 338 (54%) of these certificates were completed by general practitioners and 288 (46%) by hospital doctors. Further subcategorisation of hospital doctors was a difficult task as many signatures were illegible, qualifications poorly if at all documented and the residence of the doctor often left blank. This often made the Registrar's task more difficult when enquiring about serious inaccuracies. However, in all cases, the place of death of the deceased was documented allowing the differentiation into hospital doctors and general practitioners.

TABLE

Inaccuracies in the causes of death showing type and number of cases

Type of inaccuracy	GP	Hosp.	GP + Hosp.	% of Total
Mode of dying	13	36	49	5.2
Poor terminology	55	94	149	15.8
Clinical term or symptom	8	26	34	3.6
Sequence error	38	31	69	7.3
Non-existent terminology	2	1	3	0.3
Referred to Coroner:	6	7	13	1.4
• Trauma	2	1	3	
• Industrial lung disease	4	2	6	
• Underlying cause of death unknown	0	4	4	
Total	122	195	317	33.6

One inaccuracy was identified in 317 (33.6%) of cases registered. More than one inaccuracy was identified in 81 (8.6%) cases. (See Table 1). Thirteen cases, 1.4% of the total, were sufficiently serious to warrant referral to the Coroner. This figure is a gross understatement because there are several enquiries from the Registrar of Births & Deaths staff that each Coroner's office handles on the telephone; however, a formal record of these is not maintained. In the 13 cases mentioned above, one certificate referred to "old fracture of left hip" as the underlying cause of death. In one case the immediate cause of death was given as "intracerebral haemorrhage" without qualification. In another the underlying cause of death was given as "pressure sores" following on a period of immobility. In two cases the certificates did not exclude trauma as the underlying cause of death; in six cases the certificates did not exclude industrial lung disease. In the remaining four cases, use of ambiguous terms such as "chest infection," "aspiration pneumonia" (unqualified) "cardiac failure" (unqualified) and "aspiration pneumonia due to bowel obstruction" led to referral to the Coroner.

In 49 (5.2%) cases a mode of dying was stated without qualification. Examples included terms such as left ventricular failure, congestive cardiac failure, acute renal failure, chronic renal failure, respiratory failure and chronic brain failure.

In 149 (15.8%) cases poor terminology was used including many cases labelled "cerebrovascular accident", including the abbreviation CVA; one certificate used the term "CVAfi left hemiparesis". Cerebrovascular *accident* should not be used on a death certificate, even though it conveys a clear clinical event, because it is poor terminology and because the death is not accidental as is suggested by the phraseology; it is in effect a natural death. Others used terms such as "carcinomatosis", "disseminated malignancy" with no reference to the underlying malignant condition, even though "unknown" would have sufficed in those cases where the primary remained unidentified. Other examples of poor terminology were "debility", "lung neoplasm", "circulatory insufficiency", "aspiration pneumonia" (unqualified), "pulmonary oedema" (unqualified) and "septicaemia" (unqualified).

In 34 (3.6%) cases unqualified clinical terms were used including "atrial fibrillation", "chest infection", "anuria", "shortness of breath",

"gangrenous feet", "severe haemoptysis", "stroke", "unstable angina", "atrial tachycardia", "heart block", "haemorrhage per rectum", "melacna" and "bleed from carotid artery." Some of these certificates contained more than one error, usually sequence error and unqualified mode. Three of the terms used were non-existent: "mamacarcinoma", "myocardial ileus" and "secondary carcinomatosis".

In 69 (7.3%) cases there was a sequence error. Often the underlying cause of death which should be either I(b) or I(c) was given as the immediate cause of death. A common example of this error is given below:

I (a) Myocardial infarction

I (b) Congestive heart failure.

In some instances it was difficult to follow the reasoning behind the statements made which bore no causal relationship e.g.:

I (a) Congestive heart failure

I (b) Dilated cardiomyopathy

I (c) Coronary artery disease

In other instances items in category I (c) should have been in category II i.e. other disease processes present contributing to the cause of death but not directly related to the main disease process:

I (a) Bronchopneumonia

I (b) Chronic obstructive airways disease

I (c) *Ischaemic heart disease*

DISCUSSION

This is the first study from Northern Ireland, where the law on death certification is slightly different from that in England and Wales.⁵ Section 7 of the Coroners Act (Northern Ireland) 1959 Ch.15,⁶ states: "Every medical practitioner, registrar of deaths or funeral undertaker and every occupier of a house or mobile dwelling and every person in charge of any institution or premises in which a deceased person was residing, who has reason to believe that the deceased person died, either directly or indirectly, as a result of violence or misadventure or by unfair means, or as a result of negligence or misconduct or malpractice on the part of others, or from any cause other than natural illness or disease for which he had been seen and treated by a registered medical practitioner within 28 days prior to his death, or in such circumstances as may require investigation

(including death as a result of the administration of an anaesthetic), shall immediately notify the Coroner within whose district the body of such deceased person is of the facts and circumstances relating to the death”.

This information is reiterated on page 1 of the book on death certification.⁷ Despite this, and despite a list of 82 indefinite or undesirable terms listed at the front of the same book, including terms like bedsores, debility, coma, renal failure, haemoptysis, haematemesis and cardiac and respiratory failure, these terms still regularly occur on death certificates. Slater³ considered that the most likely explanation for many of the inaccuracies was inadequate medical education. In Northern Ireland, Queen's University Medical School teaches the subject of forensic medicine to third year students and this includes the subject of death certification. In addition a refresher course is given to recently qualified doctors by a consultant forensic pathologist and the Belfast Coroner just prior to the commencement of the pre-registration year. The majority of hospital doctors and general practitioners working in Northern Ireland are UK graduates, overseas/EU graduates forming a very small minority. We concur with Slater³ that comprehension of the English language is not the problem. We think that the problems in death certification are more complex than the lack of medical education. The problem would appear to be one of attitude towards the writing of the death certificate and a failure to understand its significance. Very often the task of writing the death certificate is delegated to a junior clinician.⁸ This practice still continues despite a report from the Royal College of Pathologists and the Royal College of Physicians which recommended that provisionally registered house-officers should not complete death certificates.⁹ In Northern Ireland social mores demand that the funeral be held within three days, hence there is a certain amount of pressure on nursing and medical staff to complete the death certificate before the final result of the autopsy. Of the 943 death certificates examined in this study none used the information box (A) on the back of the death certificate form which asks if additional information may come to light for a more precise statistical clarification e.g. results of a post-mortem. If the deceased is the subject of a Coroner's investigation, a death certificate cannot be issued by a doctor; instead the Coroner will issue appropriate documentation.

In this study we verified the certifying doctor as a hospital doctor or general practitioner. This study showed that 460 (49%) of all deaths registered in this period were certified by general practitioners. Therefore there was no significant difference between the two groups regarding actual numbers of cases registered. However, general practitioners were responsible for less inaccuracies than hospital doctors (38% compared to 62%). This figure for general practitioners is much higher than a previous study¹⁰ where a figure of 6% was reported. This conclusion, however, should be taken in context as hospital doctors tend to deal with a higher proportion of unnatural deaths. Hence the number of potential cases to be referred to the coroner is greater in the hospital environment. The main inaccuracies by general practitioners reported in this study were due to poor terminology $n=55$ and sequence errors $n=38$. The former was mainly due to the use of the term “cerebrovascular accident”. In the cases referred to the coroner in this group one mentioned trauma as the underlying cause of death, another did not exclude trauma as pressure sores were given as the underlying cause of death, and the remaining four did not exclude industrial lung disease. Hospital doctors on the other hand performed less well than their colleagues in the community; again most of their errors were due to poor terminology.

In this study we have illustrated a similar number of inaccuracies which have been documented in other studies,^{3,11} but it must be noted that a higher percentage was identified (33.6%). Slater³ noted inaccuracies in 29% cases and Leadbeatter¹¹ 25.5%. Similar problems have been described in the USA by Kircher and Anderson.¹² This higher inaccuracy rate has been found despite undergraduate medical education in Northern Ireland. This implies that the issuing of an accurate death certificate is a more complex matter than medical education alone.¹³

We suggest a number of reasons why these inaccuracies still occur:

- (1) The subject of death certification is taught relatively early in the student's course (i.e. year 3). By the time these students reach final year (i.e. year 5) a lot of information is poorly remembered.¹⁴ A refresher course to newly qualified doctors is now taught prior to pre-registration year and hopefully this will have some effect.

- (2) It is possible that students and medical practitioners do not understand the purpose of death certification. In Start's study one of the mock examples revealed that 24% of hospital doctors would have issued a death certificate despite a clear history of violence or trauma and a possible murder/manslaughter case.¹
- (3) The writing of a death certificate is not seen as an important task by medical practitioners, and the consequences of inaccurate death certification are not appreciated.
- (4) Death certification is often delegated to the most junior medical graduate available at the time. In many instances this leads to incorrect assignation of the cause of death; a misuse of concepts of modes of death and underlying disease processes, and general misuse of category II of the death certificate.

CONCLUSION

In spite of instruction in writing of death certificates provided in this region to medical students and newly qualified doctors, this study revealed more inaccuracies than other such studies in death certification. This is also the first time general practitioners and hospital doctors' ability to issue an accurate death certificate has been compared. We found the use of poor terminology predominated in both groups. The importance of accurate death certification is obviously not grasped by students, hospital doctors and general practitioners, and the subject is more complex than appreciated. We fear that often it is not seen as an important task by clinical staff and that doctors' ability to categorise coroners' and non coroners' cases is poor.² In spite of every medical practitioner having a legal duty to report certain categories of cases to the coroner, they still fail to do so on a significant number of occasions.

We propose additional instruction to final year students and pre-registration house officers, preferably at the commencement of the apprentice year. It will be interesting to observe if the newly instituted instruction to pre-registration house officers, commenced in the Belfast teaching hospitals in 1995, has any effect on medical practitioners' ability to perform this vital task and bring about a change in attitude to the writing of death certificates.

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