

INDIVIDUAL STUDIES

Sudden death in coronary thrombosis

A study of the accuracy of death certification

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THIS is a study of 142 patients who died suddenly and were signed up as dying of coronary thrombosis. The object of the study was to find out how their practitioners knew they had died of coronary thrombosis, and if they didn't actually know, what reasons they had for giving coronary thrombosis as the cause of death. This is a matter of some importance to statisticians because it is accepted that about 40 per cent of coronary deaths are sudden, and it is probable that the figure may be nearer 50 per cent; so that if the statistics relating to the cases who die suddenly are suspect, then suspicion is bound to fall on coronary mortality figures as a whole.

Defining sudden death as being death before the doctor can reach the patient, in a small personal series, 13 out of 27 deaths were sudden. Sleet (1968) reported death to be sudden in 24 out of 50 coronary deaths in his general practice. Kinlen (1969) found that 141 out of 220 coronary deaths were sudden; his study was confined to patients of under 70 years of age. McNeilly and Pemberton (1968) found that 48.7 of 998 patients dying of coronary thrombosis were either found dead or were dead before an ambulance could reach them.

This is a retrospective study of 142 patients whose death was sudden and who were certified as dying of coronary thrombosis. Sudden death was defined as death before the doctor reached the patient. Patients already under treatment for coronary thrombosis were excluded. Hospital patients were included only if they were in hospital for some other condition and died unexpectedly from a supposed coronary thrombosis.

Eleven general practitioners took part. They were responsible for the care of approximately 30,000 patients, and the number of doctor-years covered was seventy-three. These practitioners were widely scattered throughout the country and urban, suburban and rural practices were all represented.

This is obviously not a random sample of general practitioners because the number keeping good records in a form suitable for retrospective research is extremely small; nevertheless, there is no reason to suppose that these doctors differ in their certification habits from other practitioners. Nearly all the doctors taking part were members of the Retrospective Survey Group of the Royal College of General Practitioners—a group of practitioners keeping careful records intended to be used for retrospective research.

Place of death. Sudden death as defined above occurred as follows:

At home	114
In hospital	8
Elsewhere	20
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	142
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Accuracy of death certificate. As well as being asked to give the basis for certifying coronary thrombosis as the cause of death, doctors were asked to make an estimate of how accurate they thought each certificate was. They were asked to allot each patient to one of three groups:

- Group 1. 100 per cent accurate.
- Group 2. Probably fairly accurate.
- Group 3. A 'toss-up'. No good evidence one way or the other.

They allotted their cases to the three groups as follows:

Group 1. One hundred per cent accurate: 60 cases. Of these, 46 were proved by necropsy, eight had had previous coronary thromboses, five had a past history of angina and the remaining certificate was based on the onlookers' description of the mode of death.

Group 2. Probably fairly accurate: 40 cases. Practitioners gave the following reasons for certifying coronary thrombosis as the cause of death:

Previous angina	19
Previous coronary thrombosis	6
Onlookers' description of death	6
Previous hypertension	3
Previous heart failure	3
Sudden death	2
Previous cerebrovascular accident with diabetes	1
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	40

Group 3. A "toss-up": 42 cases. In this group the cause of death given on the death certificate was by definition little more than guesswork. The reasons for writing coronary thrombosis on the death certificate in this group were as follows:

Sudden death	13
Onlookers' description of death	13
Previous hypertension	6
Known atherosclerosis	3
Family history	2
Previous cerebrovascular accident with diabetes	1
Obesity	1
Previous angina	1
Previous heart failure	1
Not stated	1
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	42

Examination of the above tables shows that in over one third (57 out of 142) of sudden deaths certified as being due to coronary thrombosis, not only was there no apparent antemortem evidence of coronary disease but no necropsy was performed either.

There is no doubt that provided that they are satisfied that the patient died from natural causes, many practitioners in this country, to spare the relatives, are disinclined to insist on knowing the exact cause of death and are prepared to certify all sudden deaths as being due to coronary thrombosis unless there is a positive indication of their not being due to this cause. If we accept that about 50 per cent of all coronary deaths are sudden, these figures could mean that about one fifth of all death certificates giving thrombosis as the cause of death are based on little more than guesswork. The guess of course is bound to be right in a good many cases, and Spain *et al.* (1960) found in a necropsy study of 463 white males dying within one hour of the fatal episode that advanced coronary atherosclerosis accounted for 91 per cent of deaths. But they also found that in white women of the same category, coronary disease accounted for only 52 per cent of the deaths. Furthermore in a series of autopsies on white patients of both sexes dying unexpectedly whose deaths were *unwitnessed*, coronary disease accounted for only 61 per cent of male deaths and 35 per cent of female.

To assume without post-mortem confirmation that these sudden unexpected deaths are due to coronary disease, which is what our figures show that we in general practice are doing, is to introduce into the coronary mortality statistics of this country a considerable though unquantifiable error.

The general practitioners taking part in this study were: Drs W. Blair, D. W. Cammock, G. K. Hodgkin, Marjory Hogg, R. Horn, Una Kroll, A. A. A. McCall, J. C. L. Rawes, J. L. Tasker, P. A. Walford, and G. Watt.

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 McNeilly, R. H. and Pemberton, J. (1968). *British Medical Journal*, 3, 139.
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Recollections of Past Life

The large extension of physical science in all its branches has not been without influence, even on the literary society of the day. The numerous attempts to popularize it are ever indeed left behind by its unceasing progress; and much illegitimate science has grown out of the effort to reconcile its results with old opinions, or with the fanciful theories and delusions periodically arising in the world. But still the general increase of physical knowledge may be said to have brought a new and valuable element into the ordinary intercourse of life. Few may know, or care to know, the particular metals and gases discovered in the Solar envelope; but it is profitable even simply to understand that there are material elements in the Sun, Planets, and fixed Stars, identical with those most familiar to us on earth. And the effect of knowledge of this kind must be progressive, since science is ever advancing, while other learning lingers behind—investing itself in new contexture of words, or finding at intervals new channels and modes of development, but in its material essentially the same from one generation to another.

SIR HENRY HOLLAND, BART, M.D., F.R.S., D.C.L., &C., &C.
Recollections of Past Life, 1873. P. 262.

The Barber-Surgeon's Pole

The chirurgical or surgeon's pole ought to have a strip of blue paint, another of red, and a third of white, winding round its length in a serpentine form—the blue representing the venous blood, the more brilliant colour the arterial, and the white thread being symbolic of the bandage used in tying up the arm after withdrawing the ligature. The stick itself is a sign that the operator possesses a stout staff for his patients to hold, continually tightening and relaxing their grasp during the operation—accelerating the flow of the blood by the muscular action of the arm. The phlebotomist's staff is of great antiquity. It is to be found amongst his properties in an illuminated missal of the time of Edward I.

JOHN TIMBS, F.S.A.
Doctors and Patients. 1873. P. 115.