“Sudden Death”—What Are We Talking About?

In recent years “sudden death” has come into the focus of the discussion on ischemic heart disease (IHD). At autopsy, this condition has been considered responsible for some 90% of “medically unattended deaths” following the symptoms of a heart attack in an industrialized community. We would like to draw attention to some ambiguities of the concept of sudden death.

At the present time, the meaning of the attribute “sudden” in this context is subject to considerable variation, ranging from death occurring within a few minutes to death within 24 hours of the onset of acute symptoms.

If estimations of the number of cases of sudden death are to provide useful information for decisions concerning facilities for resuscitation of victims of acute heart attacks, death occurring within 15 min, or 1 hour, appears to be more meaningful than death within 24 hours. The latter concept, however, may well comprise a number of cases, where death was not sudden but “unexpected” (which is another element partly inherent in the word sudden).

The accuracy of a statement of sudden death usually depends on the observer. From this point of view, it is important to note whether the preceding attack was witnessed or not (by any observer), and whether or not it occurred “medically unattended.” Many reports from the U. S. dealing with sudden death refer to Medical Examiner cases, most of which appear to belong to the category medically unattended according to the above definition.

With respect to the total population in the community studied, useful information is provided by the Belfast and Edinburgh surveys on the proportion of deaths occurring within certain given intervals of time. Thus, in the former survey, a breakdown was made of the duration of the fatal attack for the following categories: admitted/not admitted to hospital, and death in hospital (IHD not reason for admission to hospital). On the basis of such data it is possible to estimate the proportion of deaths occurring suddenly (within various intervals of time) and of the proportions of these cases occurring medically unattended.

In figure 1, a picture has been made of the different categories of IHD deaths in a given community according to the above reasoning. Death has been considered sudden when occurring within 1 hour of onset of the critical attack. As this definition is not unequivocal, however, other time limits are also indicated. The compartment of sudden death comprises A + B + an unknown fraction of (E + F). Medically unattended death consists of A + C + (E + F), of which, however, only A and an unknown fraction of (E + F) are sudden. “Unexpected” deaths may be found in all compartments, depending on the features of a preexisting medical history.

On the basis of data presented in the Belfast and Stockholm surveys, we have attempted to estimate the relative proportions of the compartments shown in figure 1, using three different “cutoff points” for sudden death, i.e., 15 min, 1 hour, and 24 hours. Figure 2 illustrates the cumulative percentage of deaths within the three groups at 15 min, 1 hour, and 24 hours, respectively. Figure 3 illustrates the estimated proportions of medically unattended deaths (MUD), medically attended deaths (MAD), and unwitnessed deaths (DU) from ischemic heart disease at these time intervals. For the unwitnessed

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Deaths (whether considered medically unattended or not) it was assumed that a comparable proportion of these cases occurred within the time intervals given for the witnessed deaths. It is obvious that factors such as family structure and population density will influence the proportions of witnessed/unwitnessed deaths. Likewise, the organization of medical care and access to it will influence the time intervals for medical attendance. Consequently, the interrelationships among the three compartments are also conditioned by the social structure of various populations.

Figure 1

Categories of death from ischemic heart disease (IHD) in a given community.

Figure 2

Cumulative percentages of IHD deaths by duration of last attack and category. For details see text.

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Figure 3

Estimated proportions of medically unattended, medically attended, and unwitnessed deaths from IHD.

The statements made here are based on theoretical extrapolations of the results obtained from previous studies, adapted to the conditions prevailing in Stockholm, and should only be considered as a model. However, sudden death is a major manifestation of IHD, and we believe that this concept needs more precise definitions, not least in order to facilitate comparisons between materials from different populations. This is why we have submitted these comments.

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