Sudden Cardiac Death: Do We Know What We Are Talking About?

To the Editor:

The recent article in *Circulation* by Zheng and collaborators reopens an important discussion concerning the definition and incidence of sudden cardiac death (SCD). This event was defined as “unexpected natural death from a cardiac cause within a short time period, generally <1 hour from the onset of symptoms, in a person without any prior condition that would appear fatal.” For practical purposes, this definition was simplified to denote any cardiac death occurring “out of the hospital or in the emergency room as ‘dead on arrival.’”

Such is the nature of the best available SCD-related information: it presumes to account not only for the generic cause of death (it is cardiac) but even for the specific mechanism (it is sudden, implying an arrhythmia). However, when the death certificate is filled out, definitive information concerning the (sudden) mode of death, its (cardiac) cause, and its preventability is rarely available. Therefore, physicians make guesses and, sometimes, mistakes.

In reality, everybody dies with a cardiac arrhythmia (asystole or ventricular fibrillation), even if the original condition that precipitated the final event could have been brain cancer or pneumonia. How can we know the remote cause and the mode of death without necropsy findings or sophisticated pre- and post-mortem studies? If SCD indeed denotes any unexpected, cardiac “electrical” death (which, by inference, would have been prevented by a pacemaker or an implantable defibrillator), it seems unreasonable to assume that SCD accounted for 63.6% of cardiac deaths in 1998, as claimed by Zheng. Population-based studies concerning acute myocardial infarction show that more than 50% of deaths occur before hospital admission. These deaths must have been included in the 46.7% of SCDs that occurred outside the hospital in 1998. Are not such infarcts preexistent and/or nonlethal conditions? If we do not know exactly what SCD is, should we continue to use this term while implying, like Zheng, that SCD is frequent and preventable?

What would indeed be important to identify is “premature arrhythmic death.” Unfortunately, however, without consistent electrocardiographic monitoring and necropsy data, death certificates will not elucidate the true incidence of this event.

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Response

Dr Angelini rightfully points out the current ambiguity in the definition of “sudden cardiac death” (SCD) in clinical and public health practice, as discussed in our study and other articles. There has been considerable debate concerning whether and when an unexpected death should be called “sudden” and how the cardiac origin of the death should be ascertained. However, it is obvious that SCD may not always be “electrical,” even in patients with established life-threatening arrhythmias, because events such as cardiac rupture and massive pulmonary embolism can all lead to SCD.

Consensus should be reached within the basic, clinical, and population science communities to define SCD in an operational manner. Our study provides a national estimate of sudden cardiac death incidence in the United States based on the broader definition using death certificate data, and the limitation of such data has been well discussed. A better estimate of the population burden of SCD may require a national registry, or at least a surveillance system that provides better determination of the time of the onset of symptoms and the time of death on the death certificate and validation of each underlying cause of death by medical record, autopsies, or other means. In reality, however, it is always difficult.

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