Coronary Anatomy in Acute Myocardial Infarction Patients With Sudden Out-Of-Hospital Death

The recent article by Gheeraert et al. (1) was interesting and thought-provoking. The authors suggested that acute occlusion of the left-side coronary vessels (left anterior descending [LAD] or left circumflex [Lcx] arteries) increases the risk of out-of-hospital ventricular fibrillation (VF) in acute myocardial infarction (AMI) patients. The study was designed so that they compared patients who were successfully resuscitated from VF found to be due to AMI and AMI patients without VF. Their conclusions, however, raise points of criticism.

The resuscitated patients they studied with angiography were those in whom there was a reasonably short period from the loss of consciousness to the beginning of resuscitation to assure that these patients had a chance of surviving without major neurologic deficits. The authors also discuss the possible limitation by selection bias because a great majority of patients with out-of-hospital VF fall short of reaching their series (2). However, they hypothesize that there is no bias without referring to previous studies on sudden cardiac death (SCD) victims.

The authors found that only 15% of occlusions in those AMI patients successfully resuscitated from VF were situated in the right coronary artery (RCA). This finding is contradicted by the fact that numerous studies on SCD victims with AMI have shown that RCA is the culprit occluded artery in 40 to 50% of cases (2–5). One study even addressed the issue of coronary and myocardial findings in SCD victims compared with hospital AMI patients (3) and found that inferior infarctions and RCA occlusions were more frequent in SCD victims.

It is, thus, highly likely that the results of Gheeraert et al. (1) are the consequence of selection bias. Their conclusion that RCA occlusion is associated with decreased risk of arrhythmia is also highly speculative in light of the patient selection and the results of previous studies on SCD. In asymptomatic individuals who suffer AMI, the degree of the underlying coronary disease is the most severe in the left-sided vessels, especially LAD (6). Thus, collaterals are possibly more frequently supplying the myocardium normally fuelled by LAD, and the total occlusion of RCA is likely to be associated with severe arrhythmic response in the absence of significant collaterals (7).

The major conclusion from the results presented in the study by Gheeraert et al. is that left-side coronary occlusion may, in fact, be associated with decreased risk of dying suddenly in the acute phase of AMI and select individuals who are more likely to be resuscitated successfully by the paramedics and ultimately reach the hospital and qualify for study series, such as the one commented on here.

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REFERENCES


REPLY

We thank J. Mikkelsson for his comments on our article (1). The authors would like to take this opportunity to discuss the effects of patient selection and points of interest in more detail when our results are compared with studies on sudden cardiac death (SCD).

We studied out-of-hospital ventricular fibrillation (VF) in the early phase of acute myocardial infarction (AMI). To compare our study with studies on SCD, two main points deserve attention. First, we focused on the early phase of AMI. In victims of SCD identification of subjects that were in the early phase of AMI is extremely challenging. Standard histologic techniques underestimate the true frequency of early AMI. The articles on SCD cited by Mikkelsson confirmed that only 5 to 21% of victims were in the early phase of AMI. Presence of a fresh coronary occlusion or ruptured plaque also varied between 23 and 82%, reflecting heterogeneity of methodology or studied populations. Diagnosis of