To the Editor:

We were pleased to read the study by Hisamatsu et al., which has shed some light on this particular subject. The authors propose that J-point elevation on a standard 12-lead ECG is significantly associated with an increased risk of death from cardiac causes, particularly from coronary artery disease (CAD), after adjustment for potential confounders. Their findings corroborate those of different investigators who have shown that patients with early repolarization (ER) syndromes are at higher mortality risk during the acute phase of a myocardial infarction (MI). In fact, the presence of ER has been connected to a higher vulnerability to fatal ventricular arrhythmias during the acute phase of MI. Early J-waves may represent delayed depolarization similar to that seen in peri-infarction block or dispersed heterogeneous repolarization, both of which increase the risk of arrhythmic mortality.

The present study supports the arrhythmic role of ER in patients with additional proarrhythmic triggers. In fact, Hisamatsu et al. show that individuals with J-point elevation had a remarkably elevated risk of cardiac death and death from CAD compared with those without J-point elevation, even after adjustment for confounding ECG findings and classical risk factors. Although the authors did not observe a high number of arrhythmic deaths, this was probably related to misclassification of the cause of death, as mentioned by the authors themselves. Most cases of sudden cardiac death from arrhythmia tend to be described as CAD or heart failure on Japanese death certificates. It is therefore possible that a major proportion of those deaths attributed to CAD were of an arrhythmic etiology. The fact that J-waves were not associated with higher risk for stroke supports this notion, as the arrhythmogenic potential for cerebrovascular disorders is considerably lower. Moreover, an increased risk for cardiac death was reported among individuals with suspected CAD on ECG, reinforcing the notion that further increases in the net repolarizing current (such as those provided by an ST-elevation MI, for example) with subsequent loss of the epicardial action dome and more profound dispersion of repolarization may create an optimal substrate for ventricular arrhythmias.

Some aspects of their study deserve additional comment.

- J-point elevation in anterior leads was the most frequent pattern reported, which was not surprising. However, to the best of our knowledge, this is the first time an association of ER pattern in anterior leads with arrhythmic mortality has been suggested. Most investigators have focused on J-wave patterns in the inferior or lateral leads, but although Hisamatsu et al. did report a higher risk for cardiac death in patients with these variants, ER in anterior leads may not be totally benign after all in the presence of additional proarrhythmic triggers. Olson et al. used a similar definition for ER (including J-point elevation in the anterior leads) and reported ER was significantly predictive of sudden cardiac death, primarily of the atherosclerotic type. However, the latter study suggested the increased risk could be confined to certain subgroups, in particular Caucasians and females, whereas the study by Hisamatsu et al. is peculiar in that the majority of patients with ER were male, suggesting a higher risk in this subgroup. Potential trends based on sex may merit future investigation.

- The arrhythmogenic nature of ER syndrome may not cross the entire spectrum of ethnicities, as some authors have shown that J-waves are not predictive of cardiovascular death in African Americans, suggesting a distinct electrophysiologic mechanism. As these individuals are usually at increased cardiovascular risk (compared with Caucasians and Asians) and have a higher incidence of J-waves, we would expect a stronger association between ER and arrhythmic mortality risk. However, we should consider the possibility that a different threshold for ER definition may eventually be required in different ethnicities if we intend to capture its full predictive performance for cardiovascular mortality.

- A more pronounced association between J-point elevation and cardiovascular outcomes was evident in middle-aged individuals (<60 years) compared with older people (≥60 years). This could be eventually explained by the likely higher percentage of patients from the latter group being treated with drugs known to reduce CAD-related deaths, such as antiplatelet agents, statins or beta-blockers. Furthermore, patients in the higher arrhythmic risk stratum may die sooner and, therefore, the subgroup of patients ≥60 years may actually represent a somewhat proportionally lower arrhythmic risk subgroup.

In conclusion, recent evidence clearly suggests that patients with ER syndrome may be at increased mortality risk in the context of an acute coronary syndrome. Although primary prevention of the arrhythmic risk per se is probably not cost-effective and surely very hard to attain, primary prevention of CAD in these patients seems the optimal strategy. Hopefully, future randomized controlled trials may address this hypothesis.

References


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