Editorial

Assessing risk in FRISC

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This editorial refers to ‘Quantitative T-wave analysis predicts 1 year prognosis and benefit from early invasive treatment in the FRISC II study population’† by M.D. Jacobsen et al., on page 112

‘Proverbial wisdom counsels against risk and change, but sitting ducks fare worst of all’

Mason Cooley

Jacobsen et al. suggest that T-waves on the admission electrocardiogram (ECG) of patients presenting with non-ST-elevation acute coronary syndromes deserve another look. In particular, using a variation of quantitative T-wave analysis, initially derived from observations in the TRIM study, they report that patients in the non-invasive arm of FRISC II with ≥6 ECG leads containing abnormal T-waves and concomitant ST-segment depression are at a higher risk of death or new myocardial infarction (MI) at 1 year of follow-up. Some what surprisingly, they indicate that according to their definition, the finding of abnormal T-waves present in ≥6 ECG leads was almost as powerful as ST-segment depression in predicting adverse outcomes amongst the 826 patients randomized to non-invasive therapy in FRISC II. They then go on to suggest that quantitative T-wave analysis further refines future risk scores in this important and expanding group of patients. However, the prognostic contribution of the T-wave abnormalities vs. ST-segment depression and other clinical variables to the 1 year adverse outcomes is not provided in this study. Before accepting this study’s suggestion of the prognostic utility of T-wave abnormality, it is relevant to return to the original FRISC II population recruited in Scandinavia during the 2 years ending May 1998. Eligible patients were required to have symptoms within the 48 h prior to presentation and have ECG findings of ST-segment depression, T-wave inversion, raised creatinine kinase MB, or cardiac troponin. Patients over the age of 75 years were excluded, as were premenopausal women, and a further 35% of the FRISC II population were excluded from the ECG substudy because of other ECG abnormalities.

An important omission from the report of Jacobsen et al., is a discussion of whether their findings pertain equally to women and men. Since there was a higher frequency of T-wave abnormalities on the admission ECG in women (72% of 749 women vs. 64% of 1708 men, P < 0.001) this issue is especially key given that women in the non-invasive arm had a better prognosis than men: moreover, the early invasive strategy employed in FRISC II not only failed to reduce the risk of future events amongst women, but may even have been associated with harm as has been suggested by others. In contrast to those with concomitant ST-depression, the T-wave abnormalities, as defined in this study, had no significant prognostic value in the non-invasive assigned group of patients without ST-depression. Are there data within the FRISC II study that might have yielded additional insight into the general applicability of quantitative T-wave analysis? It is now well recognized that quantitative ST-segment analysis provides further partitioning of risk amongst patients with non-ST-elevation acute coronary syndromes and use of this approach might well have attenuated or removed any incremental effect of T-wave analysis given that the ST-depression in this study was defined as ≥0.05 mV in any two contiguous leads and was not further quantitatively analysed. It is also surprising that we are not provided with the data acquired from baseline and subsequent cardiac troponins in this population since such measurements have become an accepted component of risk assessment and have recently been shown to provide incremental value over that afforded by quantitative ST-segment analysis alone.

The assessment of risk in the expanding non-ST-elevation acute coronary syndrome population has become an extraordinarily important point relevant not only to the issue of triage to early interventional
therapy but also to the application of a variety of evidence-based therapies.\textsuperscript{7} The work of Jacobsen \textit{et al.}\textsuperscript{1} is welcome in attempting to extend the capacity of simple 12-lead electrocardiography towards this cause. Notwithstanding this however, the panoply of additional biomarkers that have emerged since the FRISC II study was completed will require assimilation in any novel approach to the enhancement of risk assessment in this population. Hence, high sensitivity C-reactive protein, brain natriuretic peptide, and markers of platelet aggregation and thrombosis are appropriate additional contenders.\textsuperscript{8} In this context, the hypothesis generating observations in the current study are worthy of prospective validation.

\section*{References}