 QT dispersion in ischaemic heart disease

See page 446 for the article to which this Editorial refers

Almost a century after Einthoven’s invention of the string galvanometer, the surface electrocardiograph retains its central place in cardiological diagnosis. In seeking to extract yet more information from the standard 12 lead ECG, much attention has been given to QT dispersion. In this issue, Ikonomidis and colleagues report a collaborative overview of randomised trials of antiplatelet therapy — I: Prevention of death, myocardial infarction, and stroke by prolonged antiplatelet therapy in various categories of patients. Br Med J 1994; 308: 101–106.

References


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consequence, the haemodynamic changes were rather small. Their main findings were that the presence of viable myocardium (as assessed by echocardiographic criteria) was associated both with a smaller QT dispersion at rest, and a greater increase in QT dispersion during dobutamine stress, than was seen in its absence. Optimum QT dispersion criteria were found to predict the presence of myocardial viability with 67% sensitivity and 96% specificity. Patients with viable myocardium were more likely to have a patent infarct-related artery and to have ventricular arrhythmias during dobutamine infusion. Occurrence of arrhythmias was also associated with higher measured QT dispersion during dobutamine infusion.

Schneider and colleagues\(^7\) have also related QT dispersion at rest to myocardial viability as assessed by F-18 fluorodeoxyglucose (FDG) positron emission tomography (PET) in patients with past myocardial infarction. QT dispersion was lower in patients with substantial amounts of viable myocardium than in those having little or no residual viability in the infarct zone. This study had the added strength of follow-up after revascularization. QT dispersion of $\leq 70$ ms predicted improvement in left ventricular function with 83% sensitivity and 71% specificity.

Should measurement of QT dispersion now be included in the diagnostic assessment of patients being considered for coronary revascularization after acute myocardial infarction? The literature indicates that there are grounds for caution in both the technical procedure and its conceptual basis. Although the technique is non-invasive and readily available, a sizeable minority of patients are unsuitable because of atrial fibrillation, left bundle branch block or ambiguous T wave termination in multiple leads. Measurement error is large in proportion to the parameter being estimated (particularly where ST-T amplitude is low), whether performed manually or by computer\(^3\). The postero-inferior ventricular myocardium is not well represented in the standard 12-lead ECG. Because of the physics of their derivation, the standard limb leads provide two and not six independent measures of QT dispersion\(^7\).

The biophysical basis of QT dispersion, and the pathological processes which affect it, are not well understood. The literature in this area therefore depends heavily on empirical observations of QT dispersion in groups of patients defined by existing diagnostic tests and/or by outcome. Large numbers of small studies will from time to time produce ‘statistically significant’ associations by chance, and the test of replication is particularly important. Even real differences between groups may not yield predictive information for the individual patient. The two studies cited have usefully given estimates of sensitivity and specificity for detection of viable myocardium. However, these are derived from training sets of relatively small numbers of patients and need to be validated prospectively in larger studies using clinically important outcome measures.

Although our understanding of QT dispersion has progressed in the last decade, the technique is not yet ready for clinical application outside research. As with any new diagnostic test, we need first to know its effectiveness and cost-effectiveness in comparison with alternative management strategies. Can its use improve clinical outcome? If so, in which groups of patients? What are the full costs and benefits of its general adoption — including the consequences of false positive and false negative results? This is a demanding research agenda, but it must be considered even when the test in question looks at first sight to be easy, simple and safe.

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References


