

A Novel Electrocardiograph for Analysis of Ventricular Repolarisation

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Introduction The 12 lead ECG can be normal in patients with ischaemic heart disease. Thus, a new approach to analysing ECG repolarization using continuous wavelet transforms has been introduced by HeartSciences in their MyoVista electrocardiograph. It calculates an index of ventricular repolarization (VRI) for right and left ventricular leads before and after maximum T amplitude, and produces an overall repolarization energy (ORE) category of normal, borderline or abnormal which can be linked with LV function. Results and waveforms are output on the machine itself (Figure) together with an automated standard ECG interpretation based on the Glasgow Program. The basic aim of this preliminary study was to determine if the VRIs are age or sex dependent. A subsidiary aim was to compare conventional ECG classification against the ORE.

Methods 75 hospital patients (56 males aged 59.8 ± 16.8 , 19 females aged 69.6 ± 16.6) and a further 75 healthy adult volunteers (34 males 31.8 ± 16.7 , 41 females aged 26.7 ± 12.5) had their ECG recorded. The mean VRIs from volunteers were compared for sex difference. Correlation between VRIs and a) age, b) maximum T wave amplitude from any lead, was assessed. Standard ECG interpretations were compared with the corresponding OREs.

Results Means for each of the VRIs were significantly higher in males than females (e.g. 140.55 ± 40.26 , v 97.74 ± 23.51 for early VRI) but no correlation was identified between VRIs and age. However, correlation between VRIs and maximum T amplitude was significant (e.g. $r=0.621, p < 0.001$ for early VRI). Nine patients had a normal 12 lead ECG, of whom one had an abnormal, and eight a moderate MyoVista ORE.

Conclusion This study demonstrated for the first time that sex differences are present in the VRIs, which do not correlate with age. It also suggested that the MyoVista provides information not found in the conventional ECG.

Figure: One form of display on the MyoVista. Colours represent different energy levels. VRIs are on the right above the automated interpretation of the conventional 12 lead ECG.

