Enhancing the Acute MI Criteria in the Glasgow ECG Analysis Program to Include ST Depression

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Aims Extending the ACC/ESC criteria for STEMI to include new lead pairings has resulted in improved accuracy in some studies. The aim was to investigate if the age and sex dependent acute MI criteria in the University of Glasgow ECG analysis program (Uni-G) could be similarly enhanced.

Methods 912 prehospital 12-lead ECGs (601 male, 311 female, age 65.38 $\pm$ 13.89 years) from patients with acute coronary syndrome were recorded in Zealand, Denmark. 406 ECGs were randomly allocated to a training set and 506 to a test set. Both the ACC/ESC criteria and the Uni-G program were modified to include lead pairings -aVL,III, aVL,-III and -V2,-V3. The training set was used for evaluation. The hospital discharge diagnosis was the gold standard.

The training set was also used to explore alternative enhancements to the Uni-G criteria based on STEMI equivalence. The resulting extended criteria were evaluated on the test set.

Results For the training set, the original ACC/ESC criteria gave sensitivity (SE) 66.4% and specificity (SP) 89%; Uni-G criteria gave SE 74.8% and SP 93.9%. For the extended pairings, the ACC/ESC criteria gave SE 72% and SP 85.9% while Uni-G had SE 77.6% and SP 92.3%.

Using STEMI equivalent criteria to enhance the basic Uni-G criteria, the results were: for the training set, an increase in SE from 74.8% to 76.9% and no change in SP (93.9%); for the test set, SE was unchanged (80.1%) and SP decreased (93.2% to 92.9%).

Conclusion The improvement found by other investigators when using new lead pairings was evident using the ACC/ESC criteria but not the Uni-G criteria. The already sensitive Uni-G program gave better results than the expanded ACC/ESC criteria and all attempts at extending the criteria to other leads gave minor improvement in sensitivity at the expense of minor decrease in specificity.