Title **Systematic Review and Modeling of the Investigation of Acute and Chronic Chest Pain Presenting in Primary Care**

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Aim

To ascertain the value of methods – including clinical features, resting and exercise electrocardiography, and rapid access chest pain clinics (RACPCs) – used in the diagnosis and early management of acute coronary syndrome (ACS), suspected acute myocardial infarction (MI), and exertional angina.

Conclusions and results

For acute chest pain, no clinical features in isolation were useful in ruling in or excluding an ACS, although the most helpful clinical features were pleuritic pain and pain on palpation. ST elevation was the most effective ECG feature for determining MI, and a completely normal ECG was reasonably useful at ruling this out. Results from 'black box' studies of clinical interpretation of ECGs found very high specificity, but low sensitivity. Point-of-care testing with troponins was cost effective in a simulation of management strategies for suspected ACS. Prehospital thrombolysis based on ambulance telemetry was more effective, but more costly than if performed in hospital. In chronic chest pain, resting ECG features were not found to be useful. In exercise ECG, ST depression performed only moderately well, although this did improve for a 2 mm cutoff. Other methods of interpreting the exercise ECG did not dramatically improve the results. Weak evidence suggested that RACPCs may be associated with reduced hospital admission of patients with noncardiac pain, better recognition of ACS, earlier specialist assessment of exertional angina, and earlier diagnosis of noncardiac chest pain. A simulation exercise of models for investigating suspected exertional angina predicted RACPCs to result in earlier diagnosis of confirmed coronary heart disease (CHD) and noncardiac chest pain than models of care based on open access exercise tests or routine cardiology outpatients, but they were more expensive. The benefits of RACPCs disappeared if waiting times for further investigation (eg, angiography) were long (6 months).

Recommendations

Emergency referral is justified for suspected ACS. ECG interpretation in acute chest pain can be highly specific for diagnosing MI. Point-of-care testing with troponins is cost effective in triaging patients with suspected ACS. Resting ECG and exercise ECG have limited value in diagnosing CHD.

Methods

Searches identified studies on patients with acute chest pain (data on the diagnostic value of clinical features or ECG), patients with chronic chest pain (data on the diagnostic value of resting or exercise ECG), or the effect of RACPC. Likelihood ratios (LRs) were calculated for each study, and pooled LRs were generated with 95% confidence intervals. A Monte Carlo simulation evaluated different assessment strategies for suspected ACS, and a discrete event simulation evaluated models for assessing suspected exertional angina.

Further research/reviews required

Determine the most appropriate model of care to ensure accurate triaging of patients with suspected ACS. Establish the cost effectiveness of prehospital thrombolysis in rural areas. Determine the relative cost effectiveness of rapid access chest pain clinics compared with other innovative models of care. Investigate how rapid access chest pain clinics should be managed. Establish the long-term outcome of patients discharged from RACPCs.

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