New risk score predicts heart disease in patients with chest pain

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A new risk prediction tool can identify patients at high risk of coronary artery disease who might need further diagnostic work, says a study published on *BMJ* today. The tool is more accurate than existing models and could be easily integrated into electronic patient records or mobile applications.

Coronary artery disease is a major cause of death throughout the world. It occurs when the arteries supplying oxygen and nutrients to the heart become narrowed with fatty deposits.

Chest pain may be the first sign of the condition so current guidelines recommend using one of two prediction tools (the Diamond & Forrester model or the Duke Clinical Score) for patients with chest pain to help doctors estimate their risk and decide if further tests are needed.

However, questions about the accuracy of these tools have been raised.

So a team of European researchers decided to develop an improved prediction model using a range of variables with known links to coronary artery disease. They analysed data for 5,677 patients (3,283 men and 2,394 women) with chest pain but no previous history of heart disease from 18 hospitals across Europe and the USA.

Their basic model predicted coronary artery disease according to age, sex and symptoms. A clinical model included risk factors such as diabetes, high blood pressure, elevated lipid levels and smoking, while an

extended model added the coronary calcium score (a measure of calcium in the coronary arteries that is associated with the presence of coronary artery disease and also determines the risk of a coronary event).

Their results suggest that the Duke Clinical Score (the tool that is currently recommended by the NICE guideline) significantly overestimates the probability of coronary artery disease.

Their clinical model improves these estimates, predicting probabilities between 2% for a 50 year old female with non-specific chest pain and no risk factors and 91% for an 80 year old male with typical chest pain and multiple risk factors.

Adding the coronary calcium score improved the prediction event further.

In addition, their model does not require resting heart (ECG) readings, making it better suited for use in primary practice, while an online calculator, also developed by the team, could be easily integrated into electronic patient records or mobile applications.

Because the implementation of the NICE guidelines requires an accurate estimate of the probability of coronary artery disease, the authors conclude that their model "allows doctors to make better decisions as to which diagnostic test is best in a particular patient and to decide on further management based on the results of such tests."

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