Review: important bedside predictors are patient's description of chest pain for CAD and electrocardiography for MI

Chun AA, McGee SR. Bedside diagnosis of coronary artery disease: a systematic review. *Am J Med* 2004;**117**:334–43.

Clinical impact ratings GP/FP/Primary care ★★★★★☆☆ Internal Medicine ★★★★☆☆☆
GP/FP/Emergency Medicine ★★★★☆☆☆ Emergency Medicine ★★★★★☆☆ Cardiology ★★★★★★☆

Q What is the accuracy of bedside findings for diagnosing coronary artery disease (CAD) and acute myocardial infarction (MI)?

METHODS

Data sources: Medline (1966 to January 2003) and reference lists.

Study selection and assessment: English language studies that included patients with symptoms suggestive of CAD, clearly defined clinical findings, had an independent comparison of the bedside finding with an acceptable diagnostic standard, and reported sufficient data to calculate sensitivity, specificity, and likelihood ratios (LRs). Studies were pooled using the random effects model.

Outcomes: detection of CAD (cardiac catheterisation showing substantial stenosis of any major epicardial vessel) or MI (elevated cardiac isoenzyme concentrations, diagnostic changes on electrocardiography [ECG], or both).

MAIN RESULTS

64 studies met the selection criteria. *CAD*. Bedside findings were grouped as chest pain classification, other pain characteristics, risk factors, and physical examination. 4 findings had the best positive LRs: the presence of typical angina, serum cholesterol concentration >300 mg/dl, history of previous MI, and age >70 years (table). 6 findings suggested a low likelihood of CAD: non-anginal chest pain (+LR 0.1), pain duration >30 minutes (+LR 0.1), intermittent dysphagia (+LR 0.2), female sex (+LR 0.3), serum cholesterol concentration <200 mg/dl (+LR 0.3), and absence of classical risk factors for CAD (+LR 0.3). *MI*. Bedside findings were grouped as quality of pain, timing of pain, pain location, associated symptoms, risk factors, and physical examination. ECG findings showed the best positive likelihood ratios (table). 6 findings suggested a low likelihood of MI: normal ECG results (+LR 0.2); age <40 years (+LR 0.2); pain that was pleuritic (+LR 0.2), positional (+LR 0.3), or sharp (+LR 0.3); and chest wall tenderness (+LR 0.3).

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CONCLUSION

In patients with stable, intermittent chest pain, the best predictors of coronary artery disease are anginal pain, high cholesterol concentrations, and previous myocardial infarction (MI). In patients with acute chest pain, electrocardiographic findings are the best predictors of MI.

Commentary

In this day when practitioners often think of using biomarkers to replace the physical examination and history, excellent work like the evidence-based review by Chun and McGee supports the value of the basics of the patient evaluation. The message is simple but scientifically supported: classifying the patient's chest pain by careful questioning is the most important tool for diagnosing CAD, and the ECG is the most important means of recognising life threatening cardiovascular events.

Although the test characteristics of biomarkers are impressive and have added considerably to health care, they should not replace the history and established tests. Physicians still need to be able to take a good patient history and read an electrocardiogram. This excellent meta-analysis should reassure medical educators that emphasis on these skills is still an essential part of medical practice. Furthermore, clinicians should carefully take and record their findings from a chest pain assessment of the patient and interpretation of the electrocardiogram. Rather than changing medical knowledge, this study re-emphasises the long established importance of the basics in patient assessment. These skilled authors deserve kudos for their diligence in performing their literature review and analyses. This article should be part of every medical school curriculum.

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Bedside diagnosis of coronary artery disease (CAD)*

Diagnosis	Finding	Number of studies (n)	Pooled +LR (95% CI)	Pooled −LR (CI)
CAD	Typical angina	8 (11 544)	5.8 (4.2 to 7.8)	–
	Serum cholesterol >300 mg/dl	2 (1585)	4.0 (2.5 to 6.3)	–
	Previous MI	7 (8216)	3.8 (2.1 to 6.8)	0.6 ({0.2}† to 0.6)
	Age >70 years	4 (15 266)	2.6 (1.8 to 4.0)	–
MI	ST elevation	6 (15 287)	22 (16 to 30)	0.6 (0.6 to 0.6)
	Q wave	3 (6733)	22 (7.6 to 62)	0.8 (0.8 to 0.9)
	ST depression	4 (13 848)	4.5 (3.6 to 5.6)	0.8 (0.7 to 0.9)

*MI = myocardial infarction. Diagnostic terms defined in glossary. LRs pooled using the random effects model.
†Data provided by author.