Recognising “painless” heart attacks

C-K Wong, H D White

Heart attacks without chest pain all too often go unrecognised and untreated

Heart attacks without chest pain all too often go unrecognised and untreated. Patients who presented without chest pain were also less likely to be discharged on aspirin (15.8% v 4.6%) or β blocker treatment (45.5% v 17.2%), and had lower participation rates in rehabilitation programmes and fewer follow up consultations.

SILENT MYOCARDIAL ISCHAEMIA

Some studies have reported high rates of silent ischaemia (70–90%) in patients with angina undergoing Holter monitoring, but these rates may have been overestimated in some cases because of under reporting of anginal symptoms in patient diaries. In a study using a microprocessor that continuously analysed ambulatory electrocardiographic recordings and emitted an audible tone whenever ST segment depression was detected, ischaemic episodes occurring during normal daily activities were found to be “silent” in 53% of instances.

Regardless of whether ischaemia is caused by increased myocardial demands (for example, during exercise testing) or a reduced blood supply (for example, during balloon occlusion at angioplasty), wall motion abnormalities develop first, followed by ST segment changes and then anginal pain (if it occurs).

Silent ischaemia in asymptomatic patients has been shown to have negative prognostic implications, but can be reduced by atenolol treatment. The ACIP study screened 1959 patients with coronary artery disease using 48 hour Holter monitoring. Silent ischaemia was detected in 982 patients (49%), and 618 of these were randomised to undergo either angina guided medical treatment, ischaemia (Holter) guided medical treatment, or revascularisation procedures. Most of these patients were men, with a mean age of 61 years, and many had multivesSEL disease (two vessels in 35% and three vessels in 41%) and a normal left ventricular ejection fraction despite a history of prior myocardial infarction. Consequently, 70% of silent ischaemia was detected, ischaemic episodes occurring during normal daily activities were found to be “silent” in 53% of instances.

Regardless of whether ischaemia is caused by increased myocardial demands (for example, during exercise testing) or a reduced blood supply (for example, during balloon occlusion at angioplasty), wall motion abnormalities develop first, followed by ST segment changes and then anginal pain (if it occurs).

Silent ischaemia in asymptomatic patients has been shown to have negative prognostic implications, but can be reduced by atenolol treatment. The ACIP study screened 1959 patients with coronary artery disease using 48 hour Holter monitoring. Silent ischaemia was detected in 982 patients (49%), and 618 of these were randomised to undergo either angina guided medical treatment, ischaemia (Holter) guided medical treatment, or revascularisation procedures. Most of these patients were men, with a mean age of 61 years, and many had multivesSEL disease (two vessels in 35% and three vessels in 41%) and a normal left ventricular ejection fraction despite a history of prior myocardial infarction. Consequently, 70% of silent ischaemia was detected, ischaemic episodes occurring during normal daily activities were found to be “silent” in 53% of instances.

Silent ischaemia in asymptomatic patients has been shown to have negative prognostic implications, but can be reduced by atenolol treatment. The ACIP study screened 1959 patients with coronary artery disease using 48 hour Holter monitoring. Silent ischaemia was detected in 982 patients (49%), and 618 of these were randomised to undergo either angina guided medical treatment, ischaemia (Holter) guided medical treatment, or revascularisation procedures. Most of these patients were men, with a mean age of 61 years, and many had multivesSEL disease (two vessels in 35% and three vessels in 41%) and a normal left ventricular ejection fraction despite a history of prior myocardial infarction. Consequently, 70% of silent ischaemia was detected, ischaemic episodes occurring during normal daily activities were found to be “silent” in 53% of instances.

Silent ischaemia in asymptomatic patients has been shown to have negative prognostic implications, but can be reduced by atenolol treatment. The ACIP study screened 1959 patients with coronary artery disease using 48 hour Holter monitoring. Silent ischaemia was detected in 982 patients (49%), and 618 of these were randomised to undergo either angina guided medical treatment, ischaemia (Holter) guided medical treatment, or revascularisation procedures. Most of these patients were men, with a mean age of 61 years, and many had multivesSEL disease (two vessels in 35% and three vessels in 41%) and a normal left ventricular ejection fraction despite a history of prior myocardial infarction. Consequently, 70% of silent ischaemia was detected, ischaemic episodes occurring during normal daily activities were found to be “silent” in 53% of instances.
Diabetics are known to have a higher incidence of multivessel disease than non-diabetics, and tend to have poorer outcomes.

The relation between silent ambulatory ischaemia and painless myocardial infarction has not been evaluated in detail. It was noted in the EMMACE study that patients with painless myocardial infarction had worse baseline demographics and worse outcomes, and received suboptimal care.

“...It was noted in the EMMACE study that patients with painless myocardial infarction had worse baseline demographics and worse outcomes, and received suboptimal care...”

The EMMACE study has extended the Framingham findings to patients admitted to hospital with “painless” myocardial infarction. About a third presented with shortness of breath, a third had symptoms suggestive of a cardiac problem (for example, collapse, upper body discomfort or resuscitated cardiac arrest), and a third had seemingly non-cardiac complaints (for example, non-specific unwellness or neuropsychiatric symptoms). The sex distribution of the presenting symptoms was not reported, and nor were concomitant illnesses. It is quite possible that these patients would have been diagnosed earlier had they routinely undergone serial ECGs and creatine kinase-MB or troponin tests. However, while the total number of patients presenting with similar symptoms during the three month study was not reported, it is likely that the numbers were substantial, raising the issue of cost effectiveness if such a strategy were implemented.

The presenting ECG

Patients with silent infarction may present with a non-diagnostic ECG—for example, left bundle branch block. The fibrinolysis trialists' collaborative overview of patients presenting with typical symptoms of cardiac ischaemia confirmed that thrombolytic treatment was beneficial in those with bundle branch block. Patients with bundle branch block had the highest mortality rates at 35 days (18.7% in those not given thrombolytics). The EMMACE study did not report the proportion of patients with left bundle branch block and their outcomes.

Troponin concentrations

The observed frequency of silent infarction will increase with the growing usage of troponin tests to diagnose myocardial infarction. Troponin concentrations remain raised for up to 14 days after myocyte injury, permitting a “delayed” diagnosis of myocardial infarction. Troponin testing may therefore be particularly useful for diagnosing painless myocardial infarction, as these patients generally present late.

When interpreting troponin tests, it should be borne in mind that while raised concentrations indicate myocardial damage, this can also be caused by factors other than myocardial ischaemia resulting from coronary thrombosis. In the absence of a history of ischaemia, other causes needed to be ruled out, such as renal disease, stroke, subarachnoid haemorrhage, pulmonary embolism, myocarditis, and heart failure.

A study from the Cleveland Clinic prospectively evaluated the utility of troponin T and troponin I concentrations for predicting in-hospital and six month outcomes in 153 patients with suspected acute coronary syndromes, including 51 with and 102 without renal impairment (mean creatinine 3.83 mg/dl and 1.12 mg/dl, respectively). The sensitivity and specificity of troponins T and I in predicting adverse outcomes were found to be reduced in patients with renal disease. The EMMACE study did not report creatinine concentrations, but it is likely that they were higher in patients with painless acute myocardial infarction because they were older.

“In patients with ST segment elevation but no chest discomfort, the decision as to whether to administer thrombolytic treatment or not is a difficult one...”

MANAGEMENT

Patients with painless myocardial infarction should be treated according to standard guidelines. In patients with ST segment elevation but no chest discomfort, the decision as to whether to administer thrombolytic treatment or not is a difficult one, as the duration of ischaemic symptoms is unclear. All patients should receive aspirin and β blockers unless contraindicated, and patients with heart failure or impaired left ventricular function should be given ACE inhibitors. In those without ST segment elevation, aspirin and heparin should be given as standard treatment.

The roles of glycoprotein IIb/IIIa inhibitors and revascularisation have not been assessed in patients with painless infarction. However, the use of such treatments is recommended in patients with electrocardiographic evidence of ischaemia and raised troponin concentrations. Treatment with abciximab has been shown to reduce ST segment shifts. In patients who are stable, tests for inducible ischaemia should be performed for the purpose of risk stratification, and continuous ambulatory ST segment monitoring can provide further information. Patients identified as having recurrent ischaemia after infarction (whether spontaneous, induced, silent or symptomatic) should undergo angiography with a view to revascularisation, as this strategy has been shown to result in better outcomes.

The EMMACE study has highlighted the fact that presentation with painless myocardial infarction is more common than many of us realise. This is an important finding because “painless” myocardial infarction all too often goes unrecognised by both patients and physicians, leading to inferior care and poorer outcomes. These patients are at high risk of unpredictable ischaemic events, and have much to gain from the aggressive use of evidence based treatments.

Authors' affiliations
C-K Wong, H D White, Cardiovascular Research Unit, Green Lane Hospital, Private Bag 92 189, Auckland 1030, New Zealand

REFERENCES
1 White HD. Moving cardiology to the front of the hospital [editorial]. Heart 2000;84:573-4.
Cardiac risk factors

Healthy eating, physical exercise, and routine medical examinations have all been promoted on stamps. The 1994 stamp from Israel promoting healthy eating was part of a set of three stamps advertising “health and well-being”, the other two stamps covering regular exercise and non-smoking. Physical fitness was the theme of the 1983 stamp from the USA showing joggers superimposed on an ECG tracing. Community health and routine medical checks were the subject for the 41 cent Australian stamp from 1990 where heart and breast diseases were emphasised in the design of the stamp.

M K Davies
A Hollman

STAMPS IN CARDIOLOGY

Cardiac risk factors

Editorial


www.heartjnl.com
Recognising "painless" heart attacks

C-K Wong and H D White

*Heart* 2002 87: 3-5
doi: 10.1136/heart.87.1.3

Updated information and services can be found at:
http://heart.bmj.com/content/87/1/3

**Supplementary Material**

Supplementary material can be found at:
http://heart.bmj.com/content/suppl/2002/02/27/87.1.3.DC1

**References**

This article cites 26 articles, 10 of which you can access for free at:
http://heart.bmj.com/content/87/1/3#BIBL

**Email alerting service**

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

**Topic Collections**

Articles on similar topics can be found in the following collections

- Drugs: cardiovascular system (8842)
- Acute coronary syndromes (2742)
- Pacing and electrophysiology (266)
- Clinical diagnostic tests (4779)
- Epidemiology (3767)
- Interventional cardiology (2933)

**Notes**

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/