

Treatment of stable angina

Use drugs before percutaneous transluminal coronary angioplasty

Angina pectoris is a common manifestation of coronary artery disease. Effective treatment was not available until Brunton introduced nitrate of amyl in 1867.¹ Drugs for the treatment of chronic angina became available much later, first the long acting nitrates, β blockers in the 1960s, and calcium antagonists in the 1970s. At the same time, bypass surgery and, later, percutaneous transluminal coronary angioplasty were introduced.

In this issue of the *BMJ* Bucher and colleagues report a meta-analysis of randomised controlled trials comparing percutaneous transluminal coronary angioplasty and medical treatment for non-acute coronary artery disease (p 73).² The treatment of stable angina aims to reduce chest pain and prevent cardiovascular events.^{1,3} Bypass surgery is more effective than medical treatment, at least according to trials carried out in the 1970s, but it is expensive, is associated with morbidity and mortality, and needs patients to stay longer in hospital.³ Percutaneous transluminal coronary angioplasty can be performed immediately after a diagnostic procedure and is less invasive than surgery, and patients can leave the hospital next day.⁴ However, it has periprocedural complications, and restenosis limits its benefits in certain patients.

Of the drug treatments, there is evidence that only β blockers reduce both angina and cardiac events.⁵ Aspirin, coumadin, and statins have no antianginal properties but do reduce cardiovascular events.^{6,7} Bypass surgery provides a better prognosis than does medical treatment only in high risk patients with main stem disease or three vessel disease. As these trials were performed in the 1970s, when statins were not available and aspirin and β blockers less frequently used, the differences may be less today. Comparisons of percutaneous transluminal coronary angioplasty and surgery suggest that mortality and infarction rates are comparable.

Considering the enormous number of these procedures carried out each year, it is surprising that only around 2000 patients have been studied in six trials which meet modern standards (that is, random treatment allocation, prospective design, proper follow up).⁸⁻¹³ Their major findings, according to Bucher et al, are that percutaneous transluminal coronary angioplasty may reduce angina more than medical treatment, but at the cost of more coronary artery bypass grafting. Unfortunately, the trials considered for the meta-analysis did not include enough patients to give a good estimate of the effect of percutaneous transluminal coronary angioplasty on rates of myocardial infarction or death.

The better antianginal effects of percutaneous transluminal coronary angioplasty than medical treatment are not surprising and go along with clinical experience. A long term follow up of the randomised intervention treatment of angina (RITA) trial confirms that percutaneous transluminal coronary angioplasty substantially improves quality of life, as perceived by

patients.¹⁴ It is a disadvantage of medical treatment that it does not reverse coronary stenosis and often does not completely relieve symptoms. Although nitrates and calcium antagonists reduce vasoconstriction, the effects of medical treatment on structural vascular changes are limited, even with statins. Only bypass surgery and percutaneous transluminal coronary angioplasty restore coronary flow. It is likely that the true antianginal effect of percutaneous transluminal coronary angioplasty is underestimated in trials, as patients with severe symptoms are not randomised. Indeed, randomisation rates of most trials are quite low (in general below 10%).^{8,12} The protocol of the atorvastatin versus revascularisation treatment (AVERT) trial considered only patients with mild symptoms.¹⁵ This may at least in part explain the considerable heterogeneity of the effects among trials and limits the generalisability of the results of this meta-analysis.

In this meta-analysis the power to detect differences in death and myocardial infarction was limited, although a trend not favouring angioplasty was seen. It may seem counterintuitive that restoring coronary blood flow should not lead to a better prognosis. Several factors might contribute: the risks associated with the procedure of percutaneous transluminal coronary angioplasty, restenosis, and the possibility that the stenosis causing angina (dilated by percutaneous transluminal coronary angioplasty) may not be the one causing myocardial infarction or death.

Are the results of this meta-analysis still relevant for today's practice? Five of the six trials were published in 1997 or before. Hence, treatment reflects practice of that time. Since then the use of statins has increased, but only one trial in this meta-analysis used aggressive lipid lowering measures.¹⁵ Similarly, today percutaneous transluminal coronary angioplasty is often followed by a stent implantation (with lower restenosis rates), but this occurred only in a minority of the patients of this meta-analysis. Thus, today the antianginal effects of percutaneous transluminal coronary angioplasty are likely to be greater than in these older trials.

The complication rates of percutaneous transluminal coronary angioplasty ranged from 0.01% to 2.8% for myocardial infarction and from 1.5% to 2.8% for immediate bypass grafting; there was only one death.⁷ Today immediate bypass grafting is rare owing to the use of stents and glycoprotein IIb/IIIa inhibitors in high risk patients. Indeed in the arterial revascularisation therapy study (ARTS), presented at the meeting of the European Society of Cardiology, which recruited patients in 1998 and 1999 and compared stenting with surgery, the emergency bypass rate was 0.5% (PW Seruys, Barcelona, 1999). Thus, with improved materials and antithrombotic prophylaxis, complications of percutaneous transluminal coronary angioplasty may be less than they were a few years ago.

Even with improved acute results in the short term, percutaneous transluminal coronary angioplasty is unlikely to improve prognosis. Indeed, patients with

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coronary disease have numerous lesions, but only a few cause angina. The probability of plaque rupture and coronary occlusion is determined by the biological features of a lesion and not by the degree of stenosis. Thus, treatment of a single lesion is unlikely to affect prognosis unless it is located in a proximal dominant vessel (that is, in the main stem or left anterior descending artery).

What can we learn from these data? In patients with severe angina, percutaneous transluminal coronary angioplasty is more effective than medical treatment. However, in patients with mild angina the procedure may not be appropriate. We will not harm patients by using drug treatment first and using percutaneous transluminal coronary only if symptoms persist.

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A "common sense revolution" for UK health care?

The Conservatives unveil their latest plans

For the NHS, just like English football, it's been a salutary month. At home some of us might just convince ourselves that the NHS is the envy of the world. But playing away, where we are compared directly with other nations, our performance is found wanting. Ranked 18th overall in the World Health Organization's worldwide league of healthcare systems, we can argue with the referee about the rules.¹ But the sneaking suspicion must be that the result is about right; indeed it could have been much worse. Other countries may spend more, be less fair and less efficient, have more trouble containing costs, and have messier organisations than the NHS, but somehow they provide a better overall standard of health care. How do they do it?

At a macro level, the difference between the United Kingdom and other European countries is obvious: the United Kingdom spends less on health care and there is far less private financing and private provision. The benefits of more expenditure are comparatively clear: more and better paid staff, more and newer equipment, and better access to the latest treatments. In this respect, the government's plans to boost spending on health care to 7.6% of the gross domestic product by 2004 will be a big help. In contrast, the link between improved performance and either a mixed economy of financing or greater private provision is less clear and, in so far as it exists, highly complex.

Not so in the mind of the Conservative party, as shown in the plans for health care sketched last week in a speech by Dr Liam Fox, shadow health minister.² So much for a Trojan horse smuggling in privatisation by stealth: privatisation is there in bold print. The Conservative party plans to encourage employers and trades unions to provide private health insurance cover for employees and to boost the number of private providers of care. The public will be given a "patient's guarantee" that on the NHS there will be maximum waiting times for patients with "the most serious conditions" and "in defined clinical areas." If treatment cannot be carried out within the patient's own health authority within the guaranteed time, it must be provided in another health authority or in the private sector. The Conservatives claim that because the NHS will be taking care of the most seriously ill patients the insurers be able to offer more affordable insurance to the rest. Employers would be encouraged, not mandated, to offer insurance through new tax incentives.

Ideology aside, these proposals raise more questions than they answer. A recent report by the Institute of Directors suggests that employers would be reluctant to pay for extra benefits even in a buoyant economy.³ Could the definition of "the most serious conditions" be broad enough to make a dent in the rising costs of insurance premiums? How will it be