assay, which is quantitative, is not complicated by dietary factors other than ingestion of blood, and measures both intact haemoglobin and its degradation products.

When evaluating faecal occult blood loss during exercise variables other than analytical ones must also be considered; these include sampling methods,¹⁰ gut transit time,^{3,8} and the faecal mass and its water content.¹¹ The normal range of daily gastrointestinal blood loss has been established as 0.5-2.0 mg haemoglobin/g by radiochromium labelling methods^{12,13}; by HemoQuant assay we found a similar range (0.10-2.53 mg/g). During prolonged walking we did not show any significant day to day variation in faecal blood loss, and clearly this form of low intensity exercise had no adverse effects on the gastrointestinal tract.

In previous studies of marathon runners tests for faecal occult blood gave positive results in 8% (n=39),⁷ 13% (n=63),⁶ and 22% (n=32)² of runners after the race, but only peroxidase based screening tests were used and none excluded possible interference by medicinal or dietary factors. In our study 13 out of 46 (28%) marathon runners reported taking some form of drug before the race, and in two runners dietary factors invalidated the test results.

In the only previous study that measured actual gastrointestinal blood loss before and after races of between 10 and 42.2 km faecal blood increased in 20 out of 24 (83%) runners, from a mean loss of 0.99 mg haemoglobin/g before the race to a mean peak value of 3.96 mg/g after the race, although this last figure seems to have been biased by the inclusion of one subject with a blood loss after the race of 43.2 mg/g.³ Our study of a larger and more heterogeneous population who completed a marathon found only a minor median increase in blood loss after the race equivalent to 0.4 ml of whole blood a day after we had excluded results complicated by drug or dietary factors. Although this increase was significant, we regard it as having no clinical relevance in healthy athletes. More important, however, we showed that this increase was significantly exaggerated in those who took drugs, especially analgesics, before the race. We

believe that the apparently common practice of taking analgesics before marathon running² should be strongly discouraged.

The mechanism of the gastrointestinal blood loss associated with marathon running has been recently reviewed¹⁴ and variously attributed to gut ischaemia, mechanical factors including "caecal slap"¹⁵ and volvulus,¹⁶ and aggravation of pre-existing occult or overt gut lesions.

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(Accepted 16 June 1987)

SHORT REPORTS

Echocardiography in ischaemic cerebrovascular disease

Despite several studies the indications for echocardiography in ischaemic cerebrovascular disease and its impact on treatment remain undefined. In randomly tested patients the yield has been poor and echocardiography has not been reported as a screening method.¹ On the other hand, liberal use of echocardiography has been encouraged in young patients with cardiac disease, especially when angiograms have been unhelpful.^{2,3}

The purpose of this study was, firstly, to identify useful predictors that would detect patients with embolic cardiac disease and, secondly, to discover the prevalence and type of echocardiographic abnormalities in these patients.

Patients, methods, and results

During September 1983 to December 1985 we examined a total of 97 patients, most of whom were suffering from ischaemic infarction of the carotid territory. All patients were aged under 70 and the 55 patients aged 49 or less accounted for three quarters of all patients of that age in our own hospital's catchment area who suffered ischaemic strokes. Both two dimensional and M mode echocardiography was performed on all patients according to the recommendations of the American Society of Echocardiography.⁴ The type of equipment used was an ATL Mk 300C with a 3.0 MHz transducer.

We chose the following as possible predictors of echocardiographic abnormalities: evidence of cardiac disease reported in the case notes, cardiac murmurs, electrocardiographic abnormalities, and increased size of the heart in radiographs. Carotid angiography of the affected artery was performed in 72 patients and the angiograms classified according to presence or absence of atheromatosis.

Fifty eight of the 97 patients had an abnormal echocardiogram, 11 showing left atrial or ventricular thrombi (table). The prevalence and type of abnormalities in patients under 50 were identical with those in the whole sample. The presence of

one or more of the four predictors was associated with an increased risk of echocardiographic abnormalities ($\chi^2=23.4$; df=4; $p<0.0005$), 31 out of 35 patients positive for two or more of the predictors having an abnormal echocardiogram. On the other hand, 11 of the 34 patients without any of the predictors had an abnormal echocardiogram, in two cases showing left atrial or ventricular thrombi. Carotid angiograms had no predictive value; the echocardiogram was abnormal in 12 out of 20 patients with atheromatous changes in the angiogram and in 32 out of 50 patients whose angiograms either were completely normal or showed occlusions of some of the distal cerebral arteries only.

Echocardiographic findings in 97 patients with ischaemic cerebrovascular disease

	No of patients
Left atrial/ventricular thrombus associated with local hypokinesia (three cases) and hypertrophic obstructive cardiomyopathy, mitral valve prolapse, prosthetic valve, mitral stenosis/insufficiency, and aortic valve thickening (one case each)	11
Left atrial/ventricular dilatation	11
Mitral valve prolapse	9
Aortic cusp fibrosis/thickening	7
Local hypokinesia	5
Hypertrophic obstructive cardiomyopathy	3
Ventricular wall hypertrophy	3
Aortic stenosis/insufficiency	2
Mitral stenosis/insufficiency	1
Mitral insufficiency	2
Intramural calcification, right ventricular hypertrophy, atrial septal defect, fibrous plaque of myocardium (one case each)	4
Normal	39
Total	97

Comment

The prevalence (60%) of echocardiographic abnormalities in every sixth case with left atrial or ventricular thrombi in this comparatively young patient sample was high. Given that three quarters of all patients under 50 in our catchment area who suffered from ischaemic strokes were included in the study, the figures may be regarded as fairly representative of this age group. The association of echocardiographic abnormalities with the predictors used seems proved. The presence of two or more predictors meant a 90% probability of an abnormal echocardiogram. On the other hand, 11 of the 34 patients without a predictor had an unexpectedly abnormal echocardiogram, one in five showing a left atrial or ventricular thrombus. In contrast with earlier findings,³ the carotid angiograms had no predictive value.

We conclude that echocardiography is worth while in ischaemic cerebrovascular disease. Because of the low incidence of cerebral ischaemia in patients aged under 50 (around 10 cases/100 000 a year) all these patients may be examined without undue demands on resources. Older patients may be selected for examination by using the predictors listed above. Echocardiography may be a decisive factor in choosing treatment, though the place of anticoagulants remains controversial.

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(Accepted 15 April 1987)

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Transcutaneous electrical stimulation for ischaemic pain at rest

Patients with critically ischaemic legs often develop severe continuous pain at rest. Pain relief is often provided with intramuscular injections of opiates, which can lead to excessive drowsiness and respiratory problems before major surgery. Transcutaneous electrical stimulation can provide effective relief in several chronic pain syndromes¹; furthermore, electrical stimulation of the nervous system may affect blood flow to the extremities.² We report our initial findings of electrical stimulation on pain in patients with severe peripheral vascular disease.

Patients, methods, and results

Twenty consecutive patients who had had two weeks' continuous severe pain at rest in a critically ischaemic foot were allocated randomly (from a table of random numbers) to one of two groups within two hours of admission. One group received transcutaneous electrical stimulation for 48 hours and the other received sham stimulation. Both groups had equal access to intramuscular morphine 10 mg on demand if pain relief was inadequate. An index of ankle brachial systolic arterial pressure was measured with a Doppler probe before treatment. Pain was assessed every 12 hours on a standard 100 mm linear analogue scale³; patients were asked to record the average amount of pain experienced over each 12 hour period, and morphine requirements were noted. Two pregelled six inch electrodes were applied longitudinally to the thigh of the ischaemic leg, and transcutaneous stimulation was provided by a Wright Care transcutaneous electrical stimulation system (Dow Corning Wright, Berkshire). All patients had a short demonstration on the use of the device and were told that they might experience a tingling sensation. The light indicator on the stimulation device was covered by an opaque material, and the polarity of the batteries in the device was reversed for the patients receiving sham treatment.

Ten patients (mean age 64, range 44-75) received sham treatment and 10 (mean age 68, range 62-82) transcutaneous stimulation. There were four men and nine smokers in the control group and six men and seven smokers in the treatment group. Four patients in each group had had vascular surgery. In the control group (mean pressure index 0.16, range 0.0-0.54) eight patients had severe ischaemic changes in the feet while seven patients in the stimulated group had ulceration of

Mean (range) linear analogue pain scores in millimetres

	Initial	12 h	24 h	36 h	48 h
Sham group	70(30-100)	53(15-100)	58(20-99)	52(12-83)	49(10-91)
Stimulated group	72(43-100)	44(27-71)	29(5-55)	35(10-55)	30(3-48)
Mann-Whitney U test	NS	NS	p<0.02	p<0.05	NS

the toes or gangrene (mean pressure index 0.29, range 0.0-0.54; no significant difference). There was no significant difference in mean analogue scores for pain before randomisation (table). The mean of the four pain scores for each patient during treatment was 52.9 mm (range 15.5-82) in the sham group compared with 34.3 mm (range 11.3-53.5) in the stimulated group ($p=0.06$, Student's *t* test; 95% confidence interval -1.2 to 38.4). Patients receiving stimulation showed a trend towards lower linear analogue scores, which was significant at 24 and 36 hours (table). Six patients in the sham group compared with two in the stimulated group required supplementary analgesia ($p=0.1698$, Fisher's exact test). The mean morphine requirements were 3 mg (range 0-20 mg) in the group receiving stimulation compared with a mean of 23 mg morphine (range 0-60 mg) in the control group ($0.05<p<0.06$, Mann-Whitney U test). No untoward side effects were noted. All patients underwent arteriography at the end of the study and reconstructive surgery during their admission.

Comment

Urgent revascularisation is essential in patients with critically ischaemic feet. While they are awaiting angiography and assessment of fitness for vascular reconstruction pain relief is often provided by the intramuscular injection of opiates, with the attendant risks of respiratory depression, drowsiness, and bronchopneumonia. Alternative methods of providing analgesia without these side effects—for example, epidural morphine⁴—have not gained widespread acceptance because of the technical skill that is often required. In our study transcutaneous stimulation was found to be simple, safe, non-invasive, and acceptable to both patients and nurses. It may be of value in the treatment of rest pain, producing good pain relief and reducing narcotic requirements for patients awaiting reconstructive surgery.

We thank Messrs D P Leiberman and D G Gilmour for allowing us to study patients under their care. Dr Gordon Murray, Lecturer in Medical Statistics, University of Glasgow, kindly gave statistical advice.

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(Accepted 29 April 1987)

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Discovery of occult legionella pneumonia in a long stay hospital: results of prospective serological survey

Pneumonia is the most common infection associated with death in the elderly, and legionellae are known to be a common cause. Legionnaires' disease was diagnosed by sputum culture and antibody seroconversion in a patient with acute pneumonia, who had been transferred to our hospital from a long stay hospital. As a result we initiated a prospective serological survey of all patients with nosocomial pneumonia in that hospital to determine whether legionella pneumonia was present but undiagnosed.

Methods and results

The study was performed from September 1984 to June 1985 in a 432 bed hospital for the long term care of elderly people, mostly men. Patients with fever or respiratory symptoms were sought daily. They were considered to have pneumonia if, in addition to a new pulmonary infiltrate, they fulfilled two major