

ately referred for vascular surgical or dermatological care. They do not state how many patients were in this category, what their definition of failure of progression of healing was, and whether these more difficult patients referred elsewhere were included in the final analysis of healing rates. If patients with an ankle-brachial pressure index of <0.5 were referred on, were they considered to have severe ischaemia and therefore excluded from the analysis?

Studies that purport to show improvements in care and financial savings for the health service are most welcome, but if this is evidence based medicine we should be permitted to see the evidence.

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- 1 Simon DA, Freak L, Kinsella A, Walsh J, Lane C, Groarke L, et al. Community leg ulcer clinics: a comparative study in two health authorities. *BMJ* 1996;312:1648-51. (29 June.)

Early vascular assessment should be carried out

EDITOR,—Deborah A Simon and colleagues' study provides further evidence supporting the role of community based clinics in the management of leg ulcers.¹ These specialised local clinics provide skill in managing leg ulcers close to patients' homes and have influenced healing and cost effectiveness.²

Our only concern with this study is that no patient was referred for venous investigation or surgery. We, like others, have shown that superficial venous disease alone is present in about half of patients with venous ulceration.³ The underlying pathophysiology here is potentially treatable by surgery, which may reduce recurrence rates as high as 69% at one year.⁴

In 1995 we established five community based leg ulcer clinics in East Gloucestershire, where early non-invasive vascular assessment is carried out (measurement of the ankle-brachial pressure index and colour venous duplex scanning). This assessment helps to define the aetiology of the ulcer and directly influences management by identifying superficial and deep components of venous disease. All patients with non-arterial ulcers are treated with four layer compression bandages until the ulcers are healed. Patients with superficial disease alone are also offered surgery to reduce venous hypertension. All patients are then recommended grade 2/3 community compression stockings.

In the first year 179 consecutive ulcerated limbs were assessed. In 123 limbs without arterial insufficiency (ankle-brachial pressure index <0.85) duplex scanning identified 59 with superficial venous disease alone. All 59 limbs were considered for surgery. Follow up data are at an early stage, but of the first 20 legs with superficial venous disease that was operated on and healed, only one (in a patient with rheumatoid disease) showed recurrence during a mean follow up of seven months. Of the 40 limbs with deep or uncorrected superficial venous disease that healed, nine showed recurrence over the same period. Simon and colleagues did not refer any patients for duplex scanning or surgery. If recurrence is reduced in the group with superficial venous disease alone (48% of limbs in our clinics) this would have major long term cost implications for health resources.

We believe that in studies of the outcome and cost of care of leg ulcers an extended study period is needed, with a programme to assess recurrence rates. Like Simon and colleagues, we have found that community clinics improve healing rates when four layer compression is used.

We enthusiastically support early vascular assessment with venous duplex scanning to identify patients who may sustain lasting benefit from simple venous surgery.

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- 1 Simon DA, Freak L, Kinsella A, Walsh J, Lane C, Groarke L, et al. Community leg ulcer clinics: a comparative study in two health authorities. *BMJ* 1996;312:1648-51. (29 June.)
- 2 Moffatt CJ, Franks PJ, Oldroyd M, Bosanquet N, Brown P, Greenhalgh RM, et al. Community clinics for leg ulcers and impact on healing. *BMJ* 1992;305:1389-92.
- 3 Blair SD. Imaging to select patients with venous ulceration. In: Greenhalgh RM, ed. *Vascular imaging for surgeons*. Philadelphia: Saunders, 1995:503-11.
- 4 Monk BE, Sarkany I. Outcome of treatment of venous stasis ulcers. *Clin Exp Dermatol* 1982;7:397-400.

Authors' reply

EDITOR,—R Sheehan-Dare wishes to know the size of the ulcers in our study. The mean size was virtually identical in the two study populations at the start of our study (22.0 cm² in Trafford and 22.7 cm² in Stockport in 1993) but was much smaller in Stockport after the introduction of the specialist community clinics (19.0 cm² and 13.7 cm² respectively in 1994).

We did not send patients for vascular surgical or dermatological care; instead we obtained an opinion from specialists as required. During the study there were no such patients, but if there had been they would have remained within the study, as would any patient referred elsewhere (of which there were also none). We are pleased that Sheehan-Dare welcomes studies showing cost effective improvements in care; to see the rest of our evidence it is more realistic for Sheehan-Dare to visit our unit than to expect the *BMJ* to publish the evidence.

We share Saboor Ghauri and colleagues' disappointment that none of our patients wanted to be referred for venous assessment and agree that early venous assessment and surgery might have resulted in even better healing rates. Elderly people in the community are, however, reluctant to attend a hospital. Nevertheless, as the confidence of both staff and patients in the community leg ulcer clinics is constantly increasing we are sure that if the study was repeated now there would be more referrals.

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Reference range for potassium concentration is lower in Barbados than Europe

EDITOR,—P W Masters and colleagues observed an increase in the number of cases of hypokalaemia among patients seen in general practice during the summer of 1995.¹ They suggest that this increase could have been due to high ambient temperatures, as shown in their figure.

In 1987 I presented a thesis entitled "Changes in clinical chemistry seen in a developing country—Barbados" as part of the final examination for membership of the Royal College of Pathologists. In my thesis I reported a reference range for potassium concentrations in the Barba-

dian population of 2.8-4.1 mmol/l. The samples had been collected in the blood collecting centre and then transported to the laboratory. The average temperature during the day in Barbados is about 27°C, with a maximum of about 32°C. This ambient temperature, together with nutritional factors, may explain the 0.5 mmol/l downward shift in the potassium concentration in the Barbadian population compared with the concentration reported in most European texts.

Interestingly, Walmsley *et al* reported a reference range of 3.2-4.8 mmol/l for potassium concentrations. Presumably this was established in the Australian population, who experience similar climatic conditions to those in Barbados.

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- 1 Masters PW, Lawson N, Marenah CB, Maile LJ. High ambient temperature: a spurious cause of hypokalaemia. *BMJ* 1996;312:1652-3. [With commentary by M D Buckley-Sharp and D A Gardner.]
- 2 Walmsley RN, Watkinson LR, Koay ESC. *Cases in chemical pathology: a diagnostic approach*. 3rd ed. Singapore: World Scientific, 1992:39.

Misdiagnosing the persistent vegetative state

Persistent vegetative state should not be diagnosed until 12 months from onset of coma

EDITOR,—Keith Andrews and colleagues draw attention to an important issue—namely, the correct diagnosis of patients who remain apparently unaware months after sustaining acute brain damage.¹ Some caution is needed in interpreting their data.

The authors use the term "persistent vegetative state" loosely. Although a persistent vegetative state cannot be diagnosed until at least 12 months have passed from the onset of coma,² nine of the 16 patients whom the authors consider to have been misdiagnosed and whose details they give had been in a coma for less than 12 months. Therefore over half of the misdiagnoses in the study may simply reflect careless and incorrect use of the term persistent vegetative state by referring clinicians, with the patients' recovery coinciding with admission to the Royal Hospital for Neurodisability.

The security of the original diagnosis was not established in the remaining seven cases. One cannot assume that a neurologist is correct: in one case in which a persistent vegetative state had been diagnosed by an eminent neurologist, simple perusal of the notes showed recorded evidence of awareness and responsiveness (confirmed by my examination).

The first message from this study is that the clinician making the diagnosis of a persistent vegetative state must approach the task thoroughly and be experienced in assessing a patient's level of consciousness and awareness. Every clinician confronted with this difficult task should always obtain data from at least four sources: reading the notes thoroughly, interviewing at least one nurse who knows the patient well, interviewing at least one relative who has been close to the patient, and undertaking examination and observation. Throughout this process the clinician should consider whether there is an acceptable cause for the patient's state, whether drugs have a substantial role, and whether there is or has been any evidence of a meaningful response to meaningful external stimuli. It is imperative to take seriously all observations made by staff and relatives, who are usually the best witnesses.