Discussion

Many clinical signs are taught to successive generations of medical students, yet their importance and reliability have not been as carefully assessed as have more recent aids to diagnosis. The three principal methods used in this study to distinguish direct hernias from indirect hernias were chosen because they seemed to be the most likely to give an unambiguous result. Men below the age of 30 were excluded to prevent any observer bias towards a diagnosis of indirect inguinal hernias, which are well known to preponderate in that age group.

Our results indicated that although the methods enable correct prediction of the nature of the hernia to be made more often than by chance, even considering the relative incidence of the types of hernia, they do not enable a diagnosis to be made with complete accuracy. Two observers in agreement were much more accurate in their diagnosis than when in dispute, but since agreement occurred in just over half the cases the overall accuracy remained disappointing. Agreement was reached probably only when the signs were more evident.

At the start of this study the opinion of the participating surgeons was that the inguinal occlusion test was the most helpful method of distinguishing between the types of hernia. This did not prove so in practice. Two reasons for this were encountered during the study. Firstly, the internal ring may be so distended by a large hernia sac that the occluding finger fails to control the ring, and the hernia is adjudged as direct. Secondly, a laterally placed funicular direct hernia may be controlled by a finger slightly displaced medially, leading to a diagnosis of an indirect hernia sac.

These findings may be of little clinical importance where the policy is to operate on all inguinal hernias. Occasionally, however, it has been implied that it is acceptable to treat direct hernias conservatively because they seldom strangulate.[5] [8] Here a policy of management has been constructed on flimsy grounds because our study shows that the diagnosis of direct hernias is suspect.

While we advocate medical judgment based on skill and experience, where the possibility of assessing these arts objectively arises we suggest that a disservice is done to clinical science by not heeding the results of such a study. At a time when there are great pressures on the student curriculum any exercise that can be shown to be of little relevance or of poor reliability, however hallowed by usage, is best disregarded. We therefore believe that there is no further merit in attempting to distinguish between indirect and direct inguinal hernias.

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Management of acute stroke in the elderly: preliminary results of a controlled trial

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Summary and conclusions

A randomised controlled trial compared the management of elderly patients with acute stroke in a stroke unit and medical units. A significantly higher proportion of patients discharged from the stroke unit (78 of the 155 admitted) were assessed as independent compared with patients discharged from medical units (49 of the 152 admitted). The intensive use of treatment that might have been implied by creating a stroke unit did not occur, although almost all the patients admitted to the unit received occupational therapy while only 47% of the patients admitted to medical units received occupational therapy. The delay before starting treatment was significantly shorter in the stroke unit.

Results of this trial show that the stroke unit improved the natural history of stroke by increasing the proportion of patients who were returned to functional independence.

Introduction

Stroke is a major burden on the community[1] and will remain so while stroke prevention is in its infancy.[2] The indications for therapeutic or surgical intervention after stroke remain few,[3] and efforts to improve prognosis in the period immediately after onset by providing intensive care facilities have been unsuccessful.[4] Attention should therefore be shifted to establishing the most effective means of rehabilitating patients with stroke.

While general agreement exists on the principles of rehabilitation that should be adopted, little or none exists on how to organise the staff and facilities for stroke rehabilitation.[5] This was recognised by a report of the Royal College of Physicians, which recommended setting up a few stroke units based on existing departments of geriatric medicine, neurology, or rehabilitation, to act as focal points for developing facilities and organising services.[6] The report emphasised that any scheme designed to establish stroke units must include a method of assessing their value. We report the preliminary findings of such an assessment, which was undertaken to test the hypothesis that a higher proportion of patients may be returned to independence

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after admission to a stroke unit rather than a medical unit. We also attempted to assess the use of physiotherapy, occupational therapy, and speech therapy as an essential first step to establishing their relative importance in stroke rehabilitation.

Methods

The study was a randomised controlled trial, with patients being admitted either to a stroke unit or to one of 12 medical units on call for emergency admissions. The stroke unit, which was created by changing the function of a ward of 15 beds within a geriatric unit, had been operating for one year before the study began and had evolved an operational policy that was initially based on the work of Isaacs.[7] Almost all general practitioners serving a catchment population of 470 000 agreed to notify appropriate patients aged 60 years and over, using as the definition of stroke a focal neurological deficit of presumed vascular origin that had been present for at least six hours but no longer than three days. Medical staff were on call 24 hours a day to undertake home visits to confirm the practitioner's diagnosis. Patients were eligible to participate in the study if they were conscious and had an established or developing hemiplegia at the time of assessment.

The outcome of the acute phase of rehabilitation was assessed when discharge was imminent or at a cut-off point of 16 weeks after admission. The assessment was made by using a purpose-built activities of daily living unit designed to reproduce the home or any other place to which patients were being discharged. Patients were classified as independent if they could get in and out of bed, dress, were mobile indoors, could perform toileting and personal hygiene, cook a simple hot meal, feed themselves, and control their environment without human assistance; and dependent if they required human assistance to complete at least one activity or failed to carry out the activity altogether. The planning, use, and validation of the activities of daily living unit have been fully described elsewhere.[8]

Results

Altogether, 155 patients were admitted to the stroke unit and 156 patients to medical units from October 1975 to April 1978. Four

TABLE I—Outcome at end of acute phase of rehabilitation (figures are numbers (%) of patients)

		Stroke unit (n = 155)	Medical units (n = 152)
Independent	.. ..	78 (50)	49 (32)
Dependent	.. ..	47 (31)	60 (40)
Dead	.. ..	30 (19)	43 (28)

Significance of difference: $p < 0.01$ ($\chi^2 = 10.49$, df = 2).

TABLE II—Use of physiotherapy (figures are means $\pm SE$)

	Stroke unit (n = 155)	Medical units (n = 152)	Significance of differences
No (%) of patients receiving any physiotherapy..	149 (96)	134 (88)	$p < 0.05$
Delay in starting treatment (days)	3.0 ± 0.3	3.8 ± 0.2	$p < 0.05$
Duration of treatment (days)	49.3 ± 3.3	70.5 ± 7.8	$p < 0.05$
No of hours of treatment ..	21.0 ± 1.5	36.4 ± 4.0	$p < 0.001$

patients dropped out after randomisation, all in medical units. The mean age of the remaining 307 patients was 73 years. The mean interval from the onset of stroke to admission to the study was 26 hours. There were no differences between patients in the two groups as regards age, sex, social class, marital state, whether they were living alone at home or with members of their family, activities before the stroke, and duration of stroke on admission to the study. The degree of hemiplegia present on admission was remarkably similar in the two groups. Mean duration of hospital stay was 55 days in the stroke unit and 75 days in medical units; this difference occurred because more patients in the medical units stayed beyond 16 weeks.

Thirty-two patients admitted to medical units were transferred during the acute phase of rehabilitation to rehabilitation or geriatric assessment units, which contained a varied case mix. None of these patients died. Transfers occurred at a mean of 33 days after admission and entailed a further stay in the transfer unit of 75 days. The mean duration of stay of the 72 survivors who remained in the admitting medical units throughout was 96 days.

Table I summarises the outcome assessed at a mean of 60 days after admission to hospital. Seventy-eight (50%) patients admitted to the stroke unit were assessed as independent compared with 49 (32%) patients admitted to medical units. When only survivors were considered the proportions of independent patients rose to 62% (78/125) for the stroke unit and 45% (49/109) for medical units ($p < 0.05$; $\chi^2 = 6.46$, df = 1). The outcome in patients from medical units who were transferred for further rehabilitation was the same as that in survivors who remained in their admitting medical units, with 47% being assessed as independent and 53% as dependent. This excludes five patients from medical units who died after assessment. There were no significant differences ($p > 0.05$) in discharge from hospital between patients in the stroke unit or medical units, equal proportions being discharged home to live alone, with relatives, or into nursing homes or long-stay hospitals. More patients discharged from medical units to live with relatives were dependent compared with those discharged from the stroke unit.

PHYSIOTHERAPY

A high proportion of patients in both the stroke and medical units were referred for physiotherapy (table II), though the proportion was significantly higher and the delay between admission and the start of physiotherapy significantly shorter ($p < 0.05$) in the stroke unit. Patients in medical units who received physiotherapy had a significantly longer period of treatment ($p < 0.05$) and significantly more hours of treatment ($p < 0.001$). These last two differences occurred because the mean duration of hospital stay was longer for patients in medical units.

Important differences in the use of physiotherapy occurred in patients transferred from medical units compared with those who remained in the admitting hospital. Table III summarises the use of physiotherapy among survivors. The mean number of hours of physiotherapy received by the patients who were transferred was more than double that received by patients in the stroke unit. Seventy-three per cent of the physiotherapy received by this group took place after transfer from the medical unit.

OCCUPATIONAL THERAPY

Major differences in the use of occupational therapy occurred between groups (table IV). The differences in the proportions of patients receiving any occupational therapy and, particularly, the mean intervals between admission to hospital and the start of occu-

TABLE III—Details of physiotherapy according to management of survivors. (Mean results expressed $\pm SE$)

	Stroke unit (n = 125)	Medical units Transferred for rehabilitation (n = 32)	Medical units Remained in admitting hospital (n = 72)	Significance of differences* Stroke unit v transferred patients	Significance of differences* Stroke unit v remaining patients	Significance of differences* Transferred v remaining patients
No (%) of patients receiving any physiotherapy	125 (100)	32 (100)	67 (93)	NS	$p < 0.05$	NS
Mean interval from admission to referral (days)	2.9 ± 0.3	4.5 ± 0.6	3.5 ± 0.3	$p < 0.05$	NS	NS
Mean duration of treatment (days)	54.6 ± 3.6	92.3 ± 15.3	79.2 ± 12.4	$p < 0.05$	NS	NS
Mean No of hours of treatment	23.5 ± 1.7	51.4 ± 6.8	38.5 ± 6.0	$p < 0.001$	$p < 0.05$	NS

*Not significant indicates $p > 0.05$.

TABLE IV—*Use of occupational therapy. (Mean results expressed ±SE)*

	Stroke unit (n = 155)	Medical units (n = 152)	Significance of differences
No (%) of patients receiving any occupational therapy ..	136 (88)	71 (47)	p<0·001
Mean delay in starting treatment (days)	6·4±0·5	21·1±3·8	p<0·001
Mean duration of treatment (days)	46·9±3·2	68·6±10·3	p<0·05
Mean No of hours of treatment	33·3±2·4	48·2±6·1	p<0·05

pational therapy were striking. Two-thirds of all patients in the stroke unit had begun occupational therapy within one week after admission compared with only 18% of all admissions to medical units.

The proportion of patients transferred from medical units who received occupational therapy approached the proportion of the survivors in the stroke unit who received such treatment (table V). No less than 89% of the occupational therapy was provided after the transfer from medical units had occurred.

SPEECH THERAPY

There were no great differences in the use of speech therapy between groups to match those seen in the use of occupational therapy. Only 20 patients (13%) in the stroke unit and 27 (18%) in the medical units received any speech therapy. The mean delay to the start of treatment, mean duration of treatment, and mean number of hours received were nine days, 61 days, and 17 hours respectively for patients in the stroke unit; and six days, 65 days, and 11 hours respectively for patients in medical units.

AIDS AND ADAPTATIONS TO THE HOME

Prescribing aids to daily living and providing adaptations to patients' homes may have an important bearing on the outcome of stroke rehabilitation. Aids or adaptations were prescribed for 103 survivors (82%) from the stroke unit during their hospital stay compared with 58 survivors (56%) from medical units. Patients may derive no benefit from special aids and adaptations if their "accessory" aids such as spectacles, hearing aids, and dentures are not in working order. The proportions of patients in the two groups whose accessory aids were modified or replaced during the acute phase of rehabilitation were 54% in the stroke unit compared with only 11% in medical units.

Discussion

Establishing a stroke unit improved the natural history of stroke by increasing the proportion of patients who were returned to functional independence. The difference in outcome was statistically significant and may be clinically important in the context of the future organisation of services for the care and rehabilitation of elderly people with stroke.

Differences in the use of treatment were found, which might have contributed to the improved outcome of patients admitted to the stroke unit. We cannot say whether the optimum mix of treatment was used to achieve the improvement in functional prognosis. This information can come only from a series of trials examining the impact of different amounts of each com-

ponent of stroke rehabilitation in turn, while keeping all the other components constant.

Admission to the stroke unit did not result in the intensive treatment that might have been implied by the creation of such a unit. Nevertheless, almost all the patients in the unit received physiotherapy and occupational therapy, and the delays before starting treatment were shorter. The mean amount of treatment (21 hours of physiotherapy and 33 hours of occupational therapy) received by patients in the stroke unit was quite modest and significantly less than the mean amount of occupational therapy and particularly physiotherapy received by patients in medical units. The small amount of speech therapy given is not surprising, being similar to that found by other workers[9] and in line with the prevalence of dysphasia found in stroke.[10]

The policy of transferring a selected group of patients from medical units after several weeks and then subjecting them to intensive treatment must be seriously questioned. The failure to improve the functional outcome of this group of patients compared with survivors who remained in admitting medical units throughout is further evidence that treating more of the patients with rehabilitation potential and intervening earlier might be more effective than a late, concentrated effort.

Controlled trials are a way of obtaining comparable data with which to test hypotheses about alternative methods of providing health care, but restrictions in their planning, conduct, and interpretation of results must be observed.[11] In particular, the possibility of bias arising through lack of blindness must be recognised. This accounts for the lack of detail of rehabilitation methods that were used in this study. Obtaining this information would have been accompanied by the risk of influencing treatment through a heightened awareness of the study. The difference in mortality between the stroke unit (19%) and medical units (28%) was unexpected and cannot be explained satisfactorily. The difference was not statistically significant (p >0·05) and could therefore have occurred by chance alone. Nevertheless, differences in the distribution of deaths over time occurred between the stroke and medical units that were compatible with a report that stroke units reduce the number of secondary complications due to stroke.[12] Confirmation of this, however, would have required the kind of direct observation likely to encourage treatment bias in the absence of blindness.

These preliminary results are sufficiently encouraging to suggest that several stroke units should be commissioned in various parts of the country and attempts made to replicate the results. Thereafter, these stroke units might act as centres in which studies to determine the optimum balance of resources for stroke rehabilitation could be undertaken.

TABLE V—*Details of occupational therapy according to management of survivors. (Mean results expressed ±SE)*

	Stroke unit (n = 125)	Medical units		Significance of differences*		
		Transferred for rehabilitation (n = 32)	Remained in admitting hospital (n = 72)	Stroke unit v transferred patients	Stroke unit v remaining patients	Transferred v remaining patients
No (%) of patients receiving any occupational therapy ..	121 (97)	29 (91)	35 (49)	NS	p<0·001	p<0·001
Mean interval from admission to referral (days)	6·5±0·6	22·6±4·2	21·2±6·9	p<0·001	p<0·05	NS
Mean duration of treatment (days)	49·7±3·6	78·8±16·7	69·5±15·4	NS	NS	NS
Mean No of hours of treatment	35·7±4·4	76·1±11·6	31·5±5·5	p<0·01	NS	p<0·01

*Not significant indicates p>0·05.

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SHORT REPORTS

## Alpha-chain disease diagnosed by rectal biopsy

Alpha-chain disease is characterised by infiltration of the small intestine with plasma cells that secrete an incomplete alpha heavy chain of the IgA class but no light chains.[1] The disease has been reported to affect the colon[2] but this is thought to be uncommon. Diagnosis is usually made by demonstrating free alpha chains in plasma, urine, or jejunal aspirate.[3][4] We describe a case where conventional diagnostic techniques initially failed and the diagnosis was made by immunofluorescence studies. These showed large numbers of plasma cells in the rectal lamina propria that contained alpha chains but no light chains.

Case report

A 26-year-old Nigerian student who had lived in England for two years presented with a history of four months' colicky abdominal pain, profuse diarrhoea, and weight loss of 25 kg. He had had malaria when aged 10 but had no other relevant past history. He was cachectic, had pronounced finger clubbing but no lymphadenopathy, and a distended abdomen in which no masses could be felt. His haemoglobin concentration was 12·7 g/dl, white cell count $10·0 \times 10^9/l$ (10 000/mm³) with a normal differential, and erythrocyte sedimentation rate 10 mm in the first hour. Serum concentrations were: albumin 27 g/dl, alkaline phosphatase 52 King-Armstrong units/dl (normal 3-13), immunoglobulin IgG 5·6 g/dl (normal 8-18), IgA 0·68 g/dl (normal 0·9-4·5), and IgM 0·38 g/dl (normal 0·6-2·5). Duodenal aspirate grew *Escherichia coli*, *Klebsiella* species, and *Veillonella*; but no *Giardia* organisms were found. Faecal fat excretion was greatly raised at 118 mmol (33 g)/24 h (normal <18 mmol (5 g)/24 h). Barium follow-through radiographs showed a malabsorption pattern but no definite mucosal abnormality. Jejunal biopsy showed total villous atrophy, crypt hyperplasia, and a dense plasma cell infiltrate in the lamina propria. Rocket immunophoresis on concentrated urine, plasma, and jejunal aspirate,[4] using a specific anti-alpha antiserum (Mercia Diagnostics), initially failed to show alpha chains. Because of the patient's poor condition jejunal biopsy could not be repeated. Instead, rectal tissue was taken for biopsy and snap frozen in liquid nitrogen. A special stain combination was used containing anti-IgA antibody (heavy chain specific) labelled with tetrarhodamine isothiocyanate (TRITC; red) combined with anti-light chain (kappa and lambda) labelled with fluorescein isothiocyanate (FITC; green).

Strong staining for IgA (heavy chain) was seen in over 90% of plasma cells while only a few stained (in the same section) for light chains (figure). In a series of biopsies—two rectal, two jejunal, 10 of tonsils, and 35 of lymphomatous nodes—from other patients over 95% of plasma cells that stained for alpha chain also stained for light chain (G Janossy *et al*, unpublished observations). A preponderance of plasma cells staining for alpha chain but not for light chain has been seen only in alpha-chain disease. Free alpha chains were subsequently detected after further concentration of a stored urine sample but only after the immunofluorescence studies on the rectal tissue had established the diagnosis. The patient was started on prednisolone 40 mg daily, which was reduced later to 10 mg/day, and oxytetracycline

500 mg four times a day. He gradually improved. When last seen 12 months after presentation he was asymptomatic and had gained 20 kg in weight. In a recent repeat jejunal biopsy 70% of plasma cells contained both alpha and light chains but the remainder still failed to stain for light chains.
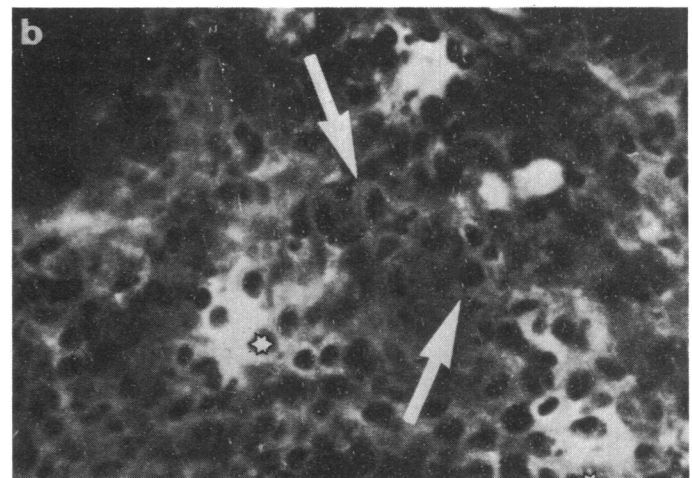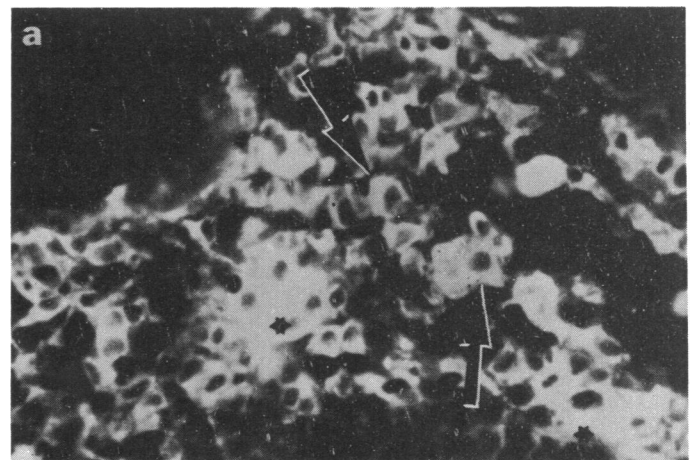
Rectal biopsy section photographed (a) with filters selective for rhodamine (staining for alpha chains), (b) with filters selective for fluorescein (staining for kappa and lambda light chains). Black arrows show two cells staining for alpha chains. White arrows show same cells failing to stain for light chains. Stars mark cell staining normally for both alpha chains and light chains.