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

W M GARRAWAY, A J AKHTAR, R J PRESCOTT, L HOCKEY

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.

References


(Accepted 15 February 1980)
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. 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 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.

**Results**

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

<table>
<thead>
<tr>
<th>TABLE I—Outcome at end of acute phase of rehabilitation (figures are numbers (% of patients))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke unit (n = 155)</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>Independent</strong></td>
</tr>
<tr>
<td>78 (50)</td>
</tr>
<tr>
<td>47 (31)</td>
</tr>
<tr>
<td>30 (19)</td>
</tr>
</tbody>
</table>

**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.

**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-

**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-

**Details of physiotherapy according to management of survivors. (Mean results expressed ±SE)**

<table>
<thead>
<tr>
<th>Stroke unit (n = 125)</th>
<th>Medical units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferred to rehabilitation (n = 32)</td>
<td>Remained in admitting hospital (n = 72)</td>
</tr>
<tr>
<td>No (%) of patients receiving any physiotherapy</td>
<td>125 (100)</td>
</tr>
<tr>
<td>Delay in starting treatment (days)</td>
<td>3 ± 0.3</td>
</tr>
<tr>
<td>Duration of treatment (days)</td>
<td>54 ± 3.6</td>
</tr>
<tr>
<td>No of hours of treatment</td>
<td>23 ± 5.3</td>
</tr>
</tbody>
</table>

**Significance of differences**

- p < 0.05
- NS

*Not significant indicates p > 0.05.*
pontent 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* and in line with the prevalence of dysphasia found in stroke.14

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 the interpretation of results must be observed.15 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.16 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.

We are grateful to the following people for advice and help without which this study could not have been undertaken: the members of the division of medicine, North Lothian District, who agreed to the establishment of the stroke unit and subsequently participated in the study, and their colleagues in the division of medicine, South Lothian District; the staff of the geriatric assessment unit, Royal Victoria Hospital; the staff of the Emergency Bed Bureau, Lothian Health Board; general practitioners; hospital medical records staff, nursing staff, social workers, and therapists; staff in the Information Services Division, Common Services Agency, for numerous ad-hoc tabulations of Scottish hospital inpatient statistics; the Scottish Health Education

### Table IV—Use of occupational therapy. (Mean results expressed ± SE)

<table>
<thead>
<tr>
<th>Stroke unit (n = 125)</th>
<th>Medical units (n = 152)</th>
<th>Significance of differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>No (%) of patients receiving any occupational therapy</td>
<td>121 (97)</td>
<td>129 (91)</td>
</tr>
<tr>
<td>Mean delay in starting treatment (days)</td>
<td>62 ± 4.8</td>
<td>21 ± 1.3</td>
</tr>
<tr>
<td>Mean duration of treatment</td>
<td>643 ± 1.2</td>
<td>90 ± 1.4</td>
</tr>
<tr>
<td>Mean No of hours of treatment</td>
<td>3.4 ± 1.7</td>
<td>2.2 ± 1.4</td>
</tr>
</tbody>
</table>

*Not significant indicates p>0.05.

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

<table>
<thead>
<tr>
<th>Stroke unit (n = 125)</th>
<th>Medical units (n = 152)</th>
<th>Significance of differences*</th>
</tr>
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<td>No (%) of patients receiving any occupational therapy</td>
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<td>129 (91)</td>
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<tr>
<td>Mean interval from admission to referral (days)</td>
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<td>Mean duration of treatment (days)</td>
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Unit; Mr C J A Andrews, department of ergonomics, Napier College of Commerce and Technology, for designing the activities of daily living assessment unit; the department of medicine (Western General Hospital) for providing office accommodation; and the research staff who worked on the project between 1974 and 1979.

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Requests for reprints should be addressed to WMG.

References


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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 colon2 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 100 x 10⁹/l (10 000/mm³) with a normal differential, and erythrocyte sedimentation rate 10 mm in the first hour. Serum concentrations were:

- 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 rhodamine 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).