Acute and subacute rehabilitation for stroke: a comparison
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The comparative merits of acute and subacute rehabilitation for stroke.

Type of intervention
Rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with left or right hemiplegia, discharged from the acute and subacute facilities and who had admission and discharge Functional Impairment Measures (FIM) ratings.

Setting
Hospital and skilled nursing unit. The economic study was carried out in the USA.

Dates to which data relate
Effectiveness and resource use data were collected during 1990 and 1991. The price year was not stated.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
No power calculations were used to determine the sample size. The patient samples based on a retrospective record search were as follows: 331 patients of the acute rehabilitation facility were included (average age of 69.1 years), versus 97 (average age of 68 years) patients at the subacute level who had FIM ratings for the 18 month period.

Study design
This was a retrospective cohort study, carried out in two centres. The average length of stay at the acute rehabilitation hospital and the subacute unit were calculated. The duration of follow-up was until discharge although the data for follow-up after discharge was not available for the subacute group. The acute group consisted of 96% of eligible patients versus 75% for the subacute group. In the former, patients were treated in a 64-bed freestanding rehabilitation
hospital with an 18-bed stroke unit. Subacute rehabilitation was provided in a 48-bed skilled nursing facility with a case mix. Ratings were obtained at admission, discharge, and follow-up. Both programmes provided a set of rehabilitation services. The additional service, specific to the subacute programme, was an activities programme (a planned series of events to foster social and emotional involvement).

Analysis of effectiveness
The analysis of effectiveness was based on treatment completers only. The primary health outcomes were discharge destination, and functional status as measured by admission and discharge FIM ratings. Treatment intensity and average length of stay were also reported. The evaluation of patient characteristics found few major differences between the two study groups. A stepwise regression analysis was performed to assess the effect on FIM gain aside from amount of treatment.

Effectiveness results
The average length of stay at the acute rehabilitation hospital was 28.6 days, and at the subacute unit was 24.2 days. Treatment exposure during the stay was 114 hours for acute and 51 hours for subacute rehabilitation. 71% of acute rehabilitation patients returned to a residential setting. The proportion transferred to either an acute care hospital or a nursing home was 30% for the subacute facility and 17% for the acute unit. The two study groups had comparable average total FIM rating scores at admission. By discharge, the total gain in terms of FIM scores was 30.41 in the acute group versus 20.56 in the subacute group (p<0.1, t test, two-tailed). The acute programme had a gain in functional status which was one third higher compared to the subacute group. In addition to the amount of treatment, regression analysis revealed that admission FIM scores, age, and time since disease onset were among the factors contributing to FIM gains of stroke; none of these varied systematically by facility.

Clinical conclusions
Treatment data show significant disparities. The length of stay was 4 days shorter in subacute rehabilitation. There were large differences in treatment exposure in favour of acute rehabilitation. The treatment differential resulted in greater FIM gains at discharge and in slightly better success in discharge disposition.

Measure of benefits used in the economic analysis
The benefit measures were successful discharge (patient returned to the community) and functional status (FIM gains).

Direct costs
Costs were not discounted due to the short time frame of the study. Quantities were reported separately from the costs in terms of length of stay and average daily billed treatment hours. Cost components were not reported separately. The cost analysis covered the average daily charges. Charge data were used as a proxy for true costs. The perspective adopted in the cost analysis was that of the health care payer. Principal payment sources were reported. The price date was not explicitly specified.

Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was carried out.
Estimated benefits used in the economic analysis
There were 235 (out of 331) successful discharges in the acute group versus 65 (out of 97) in the subacute group. By discharge, the total gain in terms of FIM scores was 30.41 in the acute group versus 20.56 in the subacute group (p<0.1, t test, two-tailed).

Cost results
The average daily charge for the acute rehabilitation stroke programme was $1,021. Total treatment charges for this set of 331 patients was $9,665,399. For the subacute programme, the average charge per day was $502, totalling $1,178,395 in charges for 97 patients.

Synthesis of costs and benefits
The average cost per successful case for patients returned to the community after acute rehabilitation was $41,129 versus $18,129 for subacute rehabilitation. The average charge per point of FIM gain was $960 (acute) and $591 (subacute).

Authors' conclusions
There were few major differences between the acute and subacute patient populations. Acute programme patients had twice as much treatment during a stay, twice the daily treatment, and twice the average charge per day. This group of patients showed substantially greater gains in FIM, but the proportion of patients discharged to the community varied little. The charge per successful discharge was more than doubled for acute rehabilitation. The charge per one point of FIM gain was also substantially higher. Subacute rehabilitation was found to be more cost-effective than acute rehabilitation.

CRD Commentary
Selection of comparator:
The reason for the choice of comparator (acute rehabilitation) is clear.

Internal validity of estimate of benefit:
The internal validity of the estimates of benefits cannot be guaranteed due to the retrospective nature of the study design coupled with the possibility of non-comparability of patients and selection bias, (as acknowledged by the authors).

Internal validity of estimate of costs:
Quantities of length of stay and average daily billed treatment hours were reported separately from the costs. Insufficient details of the methods of cost estimation were given. The use of charge data as opposed to true costs, coupled with the retrospective nature of the cost analysis, may, as the authors acknowledge, have adversely affected the study's internal and external validity.

Other issues:
In view of the retrospective nature of the study design and the lack of sensitivity analysis, the study results need to be treated with some degree of caution. The authors acknowledged that, since it is not clear how representative the study populations and treatment methods were of a larger sample of facilities, given the rapidly changing treatment scene, the applicability and generalisability of the study results to other settings cannot be guaranteed. Appropriate comparisons with other studies were not possible since, at the time of the study, the concept of subacute rehabilitation was new and it was difficult to find any scientific literature on this subject.

Implications of the study
Additional research is needed to establish policies regarding rehabilitative services.

Source of funding
None stated.

Bibliographic details

PubMedID
7763146

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Activities of Daily Living; Aged; Cerebrovascular Disorders /classification /rehabilitation; Cost-Benefit Analysis; Disability Evaluation; Female; Humans; Male; Outcome Assessment (Health Care) /economics; Regression Analysis; Rehabilitation /economics /methods; Retrospective Studies; Treatment Outcome

AccessionNumber
21995000747

Date bibliographic record published
30/11/2000

Date abstract record published
30/11/2000