Evaluation of a community-based model of rehabilitation following traumatic brain injury

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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.

CRD summary
This study evaluated the effectiveness and costs of community-based rehabilitation, after acute in-patient treatment, for patients with moderate-to-severe traumatic brain injury. The authors concluded that the community programme's effectiveness needed improvement. The methods and reporting were clear, but the sample size and two-year follow-up were insufficient, and the analysis of uncertainty was inadequate. The authors' conclusions were cautious, which seems to be appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study evaluated the effectiveness and costs of community-based rehabilitation, after the acute phase, for patients with moderate-to-severe traumatic brain injury.

Interventions
Traditional centre-based rehabilitation was compared with community-based rehabilitation. Each intervention occurred after an average of 40 days of in-patient rehabilitation.

Centre-based rehabilitation consisted of three- to five-hour sessions delivered for three to five days per week. The sessions included occupational therapy, speech therapy, social work, and visits to the home or work.

Community treatment was mostly two-hour sessions delivered once a week. The sessions focused on defining the roles that were important to the patient, and coordinating rehabilitation in the community, with the therapist, family and carers, to achieve set goals.

Location/setting
Australia/out-patient and community care.

Methods
Analytical approach:
The economic evaluation was based on a single-centre comparative cohort study. The outcomes for 77 patients with traumatic brain injury, who were treated in the community, were compared with those of 77 patients who were treated as out-patients in a hospital. The perspective of the study was not reported.

Effectiveness data:
The primary measures of effectiveness were independence in activities of daily living, employment status, and emotional adjustment. Independence was measured using the Structured Outcome Questionnaire. Behaviour and emotional state were measured using a self-reported three-point scale. The Craig Handicap Assessment and Reporting Technique (CHART) was used to assess physical independence, mobility, occupation, and social integration on a scale of 0 to 100, with 0 representing maximum handicap. Community-treated patients were prospectively selected and retrospectively matched to centre-treated patients, using demographic and clinical characteristics. The outcomes were assessed at two years after injury, by a research psychologist who was independent of the treating team.

Monetary benefit and utility valuations:
Not relevant.
Measure of benefit:
The clinical outcomes were the measures of benefit.

Cost data:
The resource use and cost data were collected, for the number of therapy sessions, using the database of the patient’s insurer, which was either the Transport Accident Commission, or the Victorian Workcover Authority. The costs included transport, and therapy (attendant care). Transport costs were taxi transport to the hospital and the therapist’s travel time to the community. The currency was Australian dollars (AUD).

Analysis of uncertainty:
The data were checked for variance and normality of distribution. Statistical tests were used to compare the differences in effectiveness between the two interventions and to measure the differences, within groups, from before intervention.

Results
There was no statistically significant difference between the groups in independence in activities of daily living. There were no differences in reported anxiety and depression between the groups. Community-treated patients were statistically significantly more likely to need ongoing supervision or assistance in financial management (p=0.05). Independence in mobility, use of transport, leisure activities, and support from carers were all less for centre-treated patients, but only the difference in support from carers was statistically significant (p=0.008), with more centre-treated patients (40%) stating that they required support (compared with 19% community-treated). Centre-treated patients were more likely to report inappropriate social behaviour (33%, compared with 14% community-treated; p=0.009).

Using CHART, centre-treated patients had higher mobility (p=0.005), but physical independence was better with community therapy (p=0.004). Difficulty in making speech understood was reported by 54% of patients with community treatment, and 26% of patients with centre treatment (p=0.005). Difficulty in following conversation was reported by 40% of community-treated patients, compared with 10% of centre-treated patients (p=0.001).

In general, centre-treated patients had more sessions than community-treated patients. The median costs of travel and attendant care were higher with centre treatment (AUD 734 travel, AUD 6,177 attendant care) than with community treatment (AUD 573 travel, AUD 3,948 attendant care). None of the costs differences reached statistical significance.

Authors' conclusions
The authors concluded that the community programme's effectiveness needed improvement. There were no differences in employment and daily living, but community treatment was less effective for some outcomes, and as there were fewer sessions, it cost less.

CRD commentary
Interventions:
The interventions were described with sufficient detail and they appear to have been appropriate.

Effectiveness/benefits:
Since the effects of traumatic brain injury can persist over a lifetime, the two year time frame was unlikely to capture all the differences. There was a trend in the effectiveness data favouring centre-based therapy, but the sample size limited the ability to find statistically significant results. The authors suggested that the differences in outcomes may have been due to the fact that those treated in the community had less face-to-face contact with occupational therapists, speech therapists, and social workers, which may have had a negative impact on their outcomes. It was not possible from this study to determine if this was the reason for the differences in the outcomes.

Costs:
Those costs to the insurers and patients were analysed. One outlier was removed from the costs; it is not clear if this was appropriate or what influence this had on the total costs. The price year was not reported, which makes it difficult to compare the results with those of other studies. The costs do not seem to have included informal care or formal assistance for financial management or other life management issues. It was unclear whether the patients' families were expected to provide this assistance, or whether there was formal care. This could be a significant and long-term cost for the patients and their families. It is unlikely that the cost categories and the two-year time-frame sufficiently reflected
the costs of the interventions.

Analysis and results:
The statistical analyses were clearly reported, with appropriate methods. The time horizon was short, given the lifelong effects that a brain injury can have on patient capabilities. Modelling of future costs and benefits, with additional costs, could give better estimates. The effectiveness, costs and resource use were reported as medians with no measures of variance, making it difficult to ascertain the effects of uncertainty. Monte Carlo simulation could have described the uncertainty in the data to give a likelihood of intervention superiority, which would be more useful for decision making. The authors acknowledged a number of limitations. For example, the centre-based therapy group was recruited from 1989 to 1998, while the community therapy group were treated between 1998 and 2001, which may have led to differences between the groups. The authors indicated that community treatment was the focus for the future, but the intensity of treatment should be increased to improve its effectiveness, which was likely to increase costs. Changes had been made to the programme, including increasing time and frequency of therapist contact, limiting the distance travelled to see patients, and patients being seen more often at the hospital.

Concluding remarks:
The study used clear methods and reporting, but the sample size and two-year follow-up were insufficient, and the analysis of uncertainty was inadequate. The authors’ conclusions were cautious, which seems to be appropriate.

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