Feasibility, safety and cost of outpatient management of acute minor ischaemic stroke: a population-based study
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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
The objective was to assess the clinical outcomes and cost of patients with minor ischaemic stroke (MIS) referred to outpatient or in-patient services for the prevention of recurrent stroke. The authors concluded that management of MIS patients in an outpatient clinic was feasible, cost saving and potentially as safe as in-patient care. Reporting and methodology were satisfactory. Limitations outlined by the authors should be considered when using the results.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the clinical outcomes and cost of patients with minor ischaemic stroke (MIS) who were referred to either an outpatient or in-patient services for the prevention of recurrent stroke.

Interventions
The intervention was outpatient management in a daily (week days only), urgent open-access TIA clinic accessible to both transient ischaemic attack (TIA) and MIS patients. The comparator was patients treated in hospital.

Location/setting
UK/in-patient and outpatient

Methods
Analytical approach:
A prospective observational study (OXVASC) was conducted across 91,105 people of all ages registered with 63 general practitioners in Oxfordshire, UK (2002-2007). Patients with TIA or MIS who sought medical care and were referred to secondary care were identified; the focus was on MIS patients. Events were classified as minor stroke if there was a focal neurological deficit lasting more than 24 hours and a National Institute of Health Scale score ≤3. Among 411 patients with MIS, 350 (61%) were referred to the outpatient clinic and 61 were referred to in-patient services. Patients were followed up using various methods (including regular assessment of hospital registers, records and coroners’ reports, and face-to-face assessments at one month, six months, one year and five years by a study nurse or doctor. The perspective was not stated explicitly but appeared to be that of the UK NHS.

Effectiveness data:
The key measure of safety was the 30-day risk of recurrent stroke. The 30-day readmission rate was also calculated. Any recurrent events requiring hospitalisation were identified through daily case ascertainment in the trial and the face-to-face follow-ups. Recurrent symptoms, drugs and any episodes that required hospitalisation were recorded with reasons for admission and the length of hospital stay. Risks of recurrent stroke (odds ratios) were calculated using Kaplan-Meier survival analysis.

Monetary benefit and utility valuations:
Not applicable.

Measure of benefit:
No summary measure of benefit was derived; the clinical outcome of reduced 30-day risk of recurrent stroke was used.
Cost data:
30-day hospital and clinic care costs per patient were calculated. All admissions to hospital, day-case assessments and lengths of stay were recorded. Unit costs were obtained from national reference costs and calculated for each day spent in each specialty ward and each outpatient clinic appointment. Costs were standardised to 2008-2009 prices using the UK National Health Service hospital and community health services inflation index. Costs were adjusted for patient characteristics which differed at baseline. Daily clinic cost was derived from UK NICE guidelines on stroke and TIA management.

A regression analysis was performed to assess whether being seen in clinic was an independent predictor of reduced 30-day hospital care costs. Included as predictors were National Institutes of Health Stroke Scale (NIHSS) score, history of atrial fibrillation, number of days before receiving medical attention and whether the patient was living alone.

Analysis of uncertainty:
Standard deviation values were calculated for cost results and 95% confidence intervals were calculated for effectiveness estimates and cost differences.

Results
For MIS patients the 30-day recurrent stroke risk in patients with MIS was similar between the two settings: 3.8% (9/237) in the clinic versus 5.3% (8/150) in the hospital (OR 0.70, 95% CI 0.27 to 1.80; p=0.61).

Recurrent stroke risk between settings remained similar at one year (11.6%, 95% CI 7.6 to 15.8 versus 13.1%, 95% CI 7.4 to 18.8, OR 0.9, 95% CI 0.48 to 1.87; p=0.72) and at five years (21.2%, 95% CI 15.5 to 26.9 versus 20.5%, 95% CI 14.2 to 26.8; p=0.84).

Other results were not statistically significant different.

The adjusted mean 30-day care cost for each patient with MIS was £5,852 for those referred to hospital versus £973 for those referred to the outpatient clinic (p<0.0001). In patients who presented within 24 hours, the mean (standard deviation) 30-day hospital care cost for each patient was £8,327 (13,342) in hospital versus £807 (1,765) in the outpatient clinic, a mean significant difference of £7,520 (95% CI 5444 to 9596; p<0.0001) for each patient.

Authors' conclusions
The authors' concluded that management of MIS patients in an outpatient clinic was feasible, cost saving and potentially as safe as in-patient care. But a randomised comparison would be justified.

CRD commentary
Interventions:
The intervention appeared to be appropriate. The authors justified their choice of intervention and focus on MIS patients, stating that for TIA patients secondary prevention delivered in outpatient clinics was recommended in clinical guidelines but for minor stroke patients the safety and effectiveness of outpatient clinics was unclear. The exact services and treatments offered to patients in each of the settings were unclear; the treatment protocol for clinic patients was described elsewhere.

Effectiveness/benefits:
The effectiveness results were reported clearly. Methods used to derive effectiveness were summarised clearly and appropriate. A review of the main study papers would be required to fully assess the validity of the methods but based on the information presented the study appeared comprehensive and well-conducted.

Costs:
The costs included were appropriate for the assumed perspective. Costs and methods used to derive them were reported clearly. Appropriate sources were used. The costs were specific to the NHS. Appropriate cost adjustment methods were applied. Limitations to the costing were reported but these were unlikely to have an impact on the results presented.

Analysis and results:
Key details of the study and patient characteristics were reported. The observational study design was an acknowledged
limitation of the study. The authors argued that a randomised trial may not have been feasible. The authors acknowledged that non-randomised allocation of patients may have favoured outcomes in the clinic-referred group due to systematic differences between patient groups (in particular differences in aetiologies and stroke severity). Costs were adjusted to mitigate some of these factors but this was not done with clinical outcomes. The authors argued that risk of bias was minimal given that there was considerable overlap between the groups. There were differences between the two groups but it was unclear whether these were significant enough to bias the results.

The results of the analysis were reported clearly. Standard deviations and confidence intervals were appropriately calculated for the outcome measures. Due to the nature and focus of the study there was no sensitivity analysis to assess the effect of parameter uncertainty and this made it difficult to make conclusions about the robustness of the results.

Concluding remarks:
Reporting and methodology were satisfactory. The limitations outlined by the authors should be considered when using the results.

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