Effect of urgent treatment for transient ischaemic attack and minor stroke on disability and hospital costs (EXPRESS study): a prospective population-based sequential comparison

Luengo-Fernandez R, Gray A M, Rothwell P M

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 compared two ways of accessing assessment and treatment during the first few high-risk days and weeks after a TIA or minor ischaemic stroke. The authors concluded that urgent assessment and treatment in a specialist outpatient clinic reduced the subsequent hospital bed-days, acute costs, and six-month disability and was likely to be cost-effective. The methodology seemed appropriate and was clearly and transparently reported. The conclusions reached appear to be robust and reflect the analysis undertaken.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The aim was to compare the two phases of the Early use of eXisting PREventive Strategies for Stroke (EXPRESS) study, to evaluate the extent of the reduction in recurrent stroke risk, in terms of reduced resource use, costs and disability, in those patients referred to the EXPRESS transient ischaemic attack (TIA) and minor stroke out-patient clinic.

Interventions
Two modes of access to the EXPRESS TIA and minor stroke out-patient clinic for urgent assessment and treatment were evaluated.

Phase one consisted of an appointment based TIA clinic, to which collaborating primary-care physicians referred any patient with suspected TIA or minor stroke. The clinic then contacted the patient directly to arrange an appointment as soon as possible. After the assessment and investigation, the clinic returned their treatment recommendations to the referring primary-care physicians.

In phase two, patients with suspected TIA or minor stroke were sent directly to the clinic, with no prearranged referral, and treatment was initiated at the clinic, on confirmation of the diagnosis.

Location/setting
UK/primary care.

Methods
Analytical approach:
This economic evaluation was based on a single clinical study. The time horizon was six months and the authors did not clearly report the perspective.

Effectiveness data:
The evidence came from a single clinical study, which was a prospective, population-based before (phase one) and after (phase two) study (EXPRESS). Phase one ran from 1st April 2002 to 30th September 2004, and included 310 patients. Phase two ran from 1st October 2004 to 31st March 2007, and included 281 patients. The protocols for the investigation and recommended treatments were identical in both phases of the study, except that treatment was initiated in the clinic in phase two. The patients were followed-up at one and six months after the initial event.
Multivariable modelling was used to assess the main predictors of hospital vascular admission, days in hospital, total costs, the prognostic indicators of new disability or death, and overall disability or death, at six months. Further details of the study can be found in Rothwell, et al. 2005 and 2007 (see ‘Other Publications of Related Interest’ below for bibliographic details).

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The primary clinical outcome in the EXPRESS study was the 90-day risk of recurrent stroke. In addition, re-admission after 90 days and new patient disability or death were also measured.

Cost data:
The costs were those for admissions to hospital and day cases during the 90 days after the initial event, split by cause. The costs of setting up the out-patient clinics for the urgent assessment and treatment of TIA and minor stroke were excluded. The resource use data were obtained from central administrative sources, patients’ records, and direct questioning at follow-up. The unit costs were obtained from national reference costs, and standardised to 2005 to 2006 prices using the UK National Health Service hospital and community health services inflation index. The currency was UK pounds sterling (£).

Analysis of uncertainty:
To account for the skewed resource use and cost data, 95% confidence interval (CI)s were calculated non-parametrically from 10,000 bootstrap estimates. A scenario analysis was also carried out for all patients with TIA or minor stroke (National Institute of Health Stroke Scale score of three points or less) in the whole Oxford Vascular Study population, of which the EXPRESS trial population was a sub-sample, irrespective of whether they were referred to the EXPRESS clinic or to other services. A scenario assuming that the efficacy of phase two was halved was also evaluated.

Results
Attendance at the phase two clinic reduced the number of 90-day recurrent strokes compared with attendance at the phase one clinic. In phase two, 6 out of 281 (2%) had another stroke, whilst, in phase one, 32 out of 310 (10%) did (p=0.0001).

Attendance at the phase two clinic also reduced the recurrent fatal strokes, disabling strokes, and overall number of fatal or disabling strokes, which were 1 out of 281 (<1%) for phase two, compared with 16 out of 310 (5%) for phase one (p=0.0005).

At six months, in phase one, 47 out of 310 patients (15%) had either died or become disabled, compared with 25 of 281 patients (9%) in phase two (odds ratio, OR: 0.51, 95% CI: 0.30 to 0.85, p=0.022).

The total mean costs per patient for admissions for TIA, stroke, or other vascular disease, were £1,056 (standard deviation, SD: 4,879) for phase one, and £432 (SD: 2,277) for phase two, which equates to a reduction of £624 (95% CI: −1,370 to −104) per patient.

The results were robust to the different scenarios evaluated.

Authors' conclusions
The authors concluded that urgent assessment and treatment of patients with TIA or minor stroke, who were referred to a specialist out-patient clinic, reduced the subsequent hospital bed-days, acute costs, and six-month disability, irrespective of the patient characteristics. Although longer term data were needed, this was likely to be a cost-effective intervention.

CRD commentary
Interventions:
This study compared intensive treatment, using mainly a statin, blood pressure-lowering drug, clopidogrel, or warfarin, with minimal treatment, during the first few high-risk days and weeks after a TIA or minor ischaemic stroke.

**Effectiveness/benefits:**
Although considered the 'gold standard', the authors acknowledged that randomisation was not feasible as patients would not consent to delayed specialist assessment and treatment. The authors made substantial efforts to control bias and confounding inherent to the study design, and put forward a strong case to demonstrate that the effects were due to the phase two clinic. The full details of the clinical trial were not presented in this paper. The multivariate modelling was reported in a clear, concise manner and the model was appropriately tested for specification.

**Costs:**
The study focused on hospital costs related to stroke and TIA. It was not clear whether possible costs differences between phase one and phase two were considered. The authors provided some justification for the omission of the cost of setting up out-patient clinics, in that the cost could not be disentangled from the ongoing parent trial. The price year and inflation details were reported and the overall level of cost reporting was good.

**Analysis and results:**
Overall, the reporting was adequate and transparent. Generalisability issues were addressed and other potential limitations were acknowledged and discussed by the authors. These included possible external biases, such as changes in health policy or management between the two phases; the short follow up period; potential differences in process of care; and the exclusion of the clinic cost in the health services.

**Concluding remarks:**
On the whole, the methodology of the study seemed to be appropriate and was clearly and transparently reported. The conclusions reached appear to be robust and reflect the analysis undertaken.

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**Other publications of related interest**


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MeSH
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