Impact of a group-based model of disease management for headache
Maizels M, Saenz V, Wirjo J

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
Patients with headache were referred to a newly established headache clinic. They were referred either by a physician or by the hospital emergency department (ED) which had identified headache patients in its records. If the initial referral suggested cluster headache, recent onset of headache, or some other serious cause for concern, the patient had an individual consultation. All the other patients were invited to participate in an educational programme. After the educational programme, a registered nurse practitioner (RNP) saw patients with less complicated migraine, chronic tension headaches, or drug rebound headache. A physician saw patients with significant co-morbidities, high narcotics or butalbital use, or a history of repeated treatment failures.

The favoured approach for treating headache in the clinic was the prescribing of triptans, where appropriate. The use of a non-steroidal anti-inflammatory drug prior to a triptan was encouraged. Tricyclic antidepressants were the most commonly prescribed prophylactic, with beta-blockers and valproic acid second-line agents. Botulinum toxin (Botox) was not used. The comparator was no headache clinic. Thus, the outcomes were reviewed for 6 months before the headache clinic was set up and for 6 months afterwards.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with a headache problem who had been referred by a physician, or who had been identified from hospital ED records. People with underdiagnosed and undertreated migraine were included, as were those with refractory headaches. Also included were patients with chronic pain and those dependent on narcotics.

Setting
The setting was secondary care. The economic study was conducted in the USA.

Dates to which data relate
The effectiveness evidence related to 1998 to 2000. No dates for the resource evidence were given. The price year was also not reported.

Source of effectiveness data
The effectiveness data were derived from a single prospective study.

Link between effectiveness and cost data
The same patients provided the cost data and the effectiveness data. However, headache-related visits were available for only 250 patients. It was unclear whether the costing was conducted retrospectively or prospectively.

**Study sample**
No power calculations to determine the sample size were reported. All 264 patients attending the headache clinic classes between April 1999 and April 2000 were included in the study.

**Study design**
This was a case-series study that was conducted in a single centre. The duration of follow-up was 6 months before the intervention and 6 months after. No loss to follow-up was reported.

**Analysis of effectiveness**
The basis of the analysis was intention to treat. The primary health outcome was the frequency of severe headaches, using a Brief Headache Screen.

**Effectiveness results**
At baseline, 91 patients reported severe headaches more than 2 days a week. Six months later, 72 (73%) of the 91 patients provided follow-up data. Of those 72 patients, 62 (86%) reported fewer severe headaches. Fifty-five patients (76%) reported severe headaches 2 days per week or less. Twenty-seven patients (37.5%) patients had severe headaches once a month or less.

**Clinical conclusions**
The results on headache severity showed an improvement in health.

**Measure of benefits used in the economic analysis**
No summary measure of benefit was used. In effect, a cost-consequences analysis was carried out.

**Direct costs**
The perspective adopted was unclear. Discounting was not carried out as the costs were incurred during less than 2 years. The costs measured were for clinic visits, ED visits and pharmacy. The pharmacy costs were restricted to the costs of triptans (sumatriptan, rizatriptan, naratriptan and zolmitriptan) and dihydroergotamine. The cost of parenteral triptans administered during clinic visits was not included. The costs were estimated from actual data. The headache-related visits were reviewed for 250 patients, while the pharmacy costs were reviewed for 264 patients. The number of visits was taken from the study, while the authors chose a theoretical cost of the visits. The source of the drug prices was not given. Uniform unit costs per dose were assigned to triptans and dihydroergotamine. The clinic and ED visits were broken down into prices and quantities, while the drug costs were given as the total costs and prices. No price year was given.

**Statistical analysis of costs**
No statistical analysis of the costs was carried out.

**Indirect Costs**
No indirect costs were measured.

**Currency**

Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The drug costs increased from $28,897 to $34,320. This represents an increase of $5,423 (19%).

Visits to the clinic were reduced by 32% ($11,580) and visits to the ED by 49% ($12,600). The reduction in visits yielded a saving of $24,180.

Comparing patients by frequency of headache-related visits, the greatest reduction in visits (46%) was in the 75 high clinic utilisers at baseline. This group also had the highest mean triptan cost, rising by 16% ($124 to $144).

The group of 53 patients who attended the headache clinic (21% of the study group) as a result of their ED records showed a reduction in headache-related visits from 276 to 205 (26%). Visits to the ED reduced from 185 to 102 (45%).

The total costs decreased by $18,757.

Synthesis of costs and benefits
Not relevant.

Authors' conclusions
The headache clinic coupled with the new emergency department (ED) protocol produced a reduction in ED and clinic visits, a significant clinical improvement, a small increase in pharmacy costs, and an overall cost reduction. The greatest improvement was seen in those patients who were most severely afflicted at baseline.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator (no headache clinic) was clear.

Validity of estimate of measure of effectiveness
The effectiveness data were derived from a single study. The basis of the analysis was a before-and-after study, which was not really appropriate for the study question. A randomised controlled trial would have been more appropriate. The authors acknowledged that the lack of a control group may reduce the relevance of the results (high risk of confounding factors). These factors may reduce the strength of their conclusions. The primary health outcome was limited to the frequency of severe headaches. The evaluation of quality of life would also have been an appropriate measure of effectiveness.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The study was therefore a cost-consequences analysis.

Validity of estimate of costs
The perspective adopted was not stated, but it is likely to have been that of the health care system. However, no indirect
costs were estimated. It would have been more appropriate to have included the indirect costs of the health technology, as headaches can often result in time taken off work. The cost of parenteral triptans administered during clinic visits and the costs of the educational programme were not included. The authors reported that hospitalisation was rarely required, but they did not state precisely how many patients required hospitalisation during the follow-up period. The costs and the quantities were only reported separately for clinic and ED visits. No statistical or other analyses of the quantities were conducted. The authors did not explain how (authors' setting or authors' opinion) they arrived at the price of clinic and ED visits and medication. No statistical or sensitivity analyses of the prices were performed. The date to which the prices related was not reported, but it could be assumed that the date lay within the dates of the effectiveness data (i.e. 1998 - 2000).

Other issues
The authors compared their work with another study (see Other Publication of Related Interest). The issue of generalisability was addressed. Any comparison with other work would have to ensure that the same study population was being studied. The authors were aware that the kind of health plan used will affect the results. The authors did report limitations of their study (highlighted in other sections of the commentary). The fact that the unit costs were estimated from the authors' setting or authors' opinions does not enhance the external validity of the analysis.

Implications of the study
For the authors, this study demonstrated that "principles of disease management can be effectively applied to a headache population, with a positive financial impact on a managed care organisation". However, due to the weaknesses of the study, further research is required to enhance the validity of the conclusions.

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Other publications of related interest

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