Cost benefit of sumatriptan to an employer

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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
Sumatriptan use in treating acute migraine

Type of intervention
Treatment.

Economic study type
Cost-benefit analysis.

Study population
Sumatriptan-using enrolees of an Independent Practice Association health maintenance organisation (IPA-HMO).

Setting
The setting was the community.

Dates to which data relate
Productivity costs were based on average wage rates by occupational class for the US population in 1993. Sumatriptan users were identified in 1994. Telephone interviews were conducted in July 1995.

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

Link between effectiveness and cost data
Costing was undertaken prospectively on the same patient sample as that used in the effectiveness study.

Study sample
101 sumatriptan-using full-time adult employees and 63 of their sumatriptan-using adult dependants (and therefore enrolees) of an IPA-HMO population were identified for inclusion in the study. This sample was drawn from a larger sample of 220 eligible patients who were identified through HMO pharmacy records as having received at least one sumatriptan injectable prescription between 1 January 1994 and 31 December 1994. Attempts were made to contact all eligible patients up to five times. 17 did not meet inclusion criteria, 4 refused, and 35 were not reached by phone. 164 interviews were completed giving a response rate of 81%. No power calculations were performed to determine an appropriate sample size.

Study design
The study used a before and after design.

**Analysis of effectiveness**
The effectiveness of sumatriptan in the acute treatment of migraine has been established in previous studies. The measures of benefit in this study included the incremental monthly reduction in lost work days, days worked without symptoms, increases in work productivity, decreases in lost leisure days, and labour costs before sumatriptan was prescribed and compared to after that time period. Absenteeism and reduced productivity whilst at work were based on retrospectively collected self-reported patient estimates. To value absenteeism and reduced productivity, respondents were asked to select their occupation class from a list provided, which identified occupation classes and average wages for the US population in 1993 US dollars. Overall changes in work productivity and costs were reported separately, although a breakdown of weekly wage rates, and corresponding changes in productivity for persons receiving these wage rates, was not given. The analysis included those who had discontinued sumatriptan use for any reason and therefore an intention to treat perspective was adopted.

**Effectiveness results**
The results revealed that lost labour costs as a result of migraine, a function of days missed from work and reduced productivity whilst at work, were decreased after sumatriptan treatment initiation. Of those subjects employed full-time outside the home, there was a 71% reduction in monthly work days missed, a 20.6% reduction in days worked with symptoms per month, and an 85% increase in productivity, and a 70% decrease in lost leisure days. Overall, the mean monthly per patient labour cost was reduced by 64% (p<.01, n=88). The net benefit per month was $435 per FTE.

**Clinical conclusions**
The availability of sumatriptan for migraine headache sufferers resulted in a reduction in lost workdays and labour costs.

**Measure of benefits used in the economic analysis**
Monetary benefits according to the avoided costs approach.

**Direct costs**
The only direct medical cost included in the study was the cost of sumatriptan. This was estimated to be the cost of the drug less the patient co-payment, plus pharmacy dispensing fees. Due to the time horizon of the analysis, the discounting of direct medical costs and benefits (productivity costs) was considered unnecessary.

**Statistical analysis of costs**
Paired t-tests were used to test for differences in productivity costs before and after the use of sumatriptan.

**Indirect Costs**
Indirect productivity costs were used as a measure of benefit in this study and were not included in the cost estimate.

**Currency**
US dollars ($).

**Sensitivity analysis**
The main analysis was based on the sample of 101 full-time employees. A secondary analysis was conducted to determine if the additional sumatriptan use by non-full-time employees (making a total sample of 164 respondents) reversed the benefit-cost conclusion. It was argued that although the lost labour cost benefit was only achieved if
employees, spouses and dependants also use sumatriptan and it is unlikely that an employer would ever restrict sumatriptan reimbursement to employees only. When the total sample of 164 respondents was included, the benefit-to-cost ratio remained positive at 6:1.1. It was determined that the sumatriptan utilisation rate would need to increase by greater than 512% before the lost labour benefits were offset by the cost of sumatriptan, assuming no further benefit was obtained.

**Estimated benefits used in the economic analysis**

The net benefit was estimated to be $435 per month per full-time employee.

**Cost results**

The per-user cost of sumatriptan was estimated to be $43.78 per month (average of 0.73 prescriptions per month multiplied by $60 cost per prescription).

**Synthesis of costs and benefits**

The incremental change in work productivity (the benefit) was compared with the incremental change in sumatriptan expenditures (cost). The benefit-to-cost ratio was found to be 10:1.

**Authors' conclusions**

The use of injectable sumatriptan decreases lost labour costs for employers.

**CRD COMMENTARY - Selection of comparators**

The standard migraine therapies in use prior to injectable sumatriptan seem to be an adequate choice of comparators. However, identification of the specific therapies used may have provided important information for the before period.

**Validity of estimate of measure of benefit**

The choice of benefit measure was based on evidence from studies that have suggested that most of the costs of migraine are indirect yet these costs had not been studied previously in relation to the use of sumatriptan. A full assessment of the economic benefits of sumatriptan would have included a broader range of benefits than simply changes in productivity, such as improved family and social functioning. However, since the perspective of this study was that of the employer, the more limited choice of measure of benefit is justified in this case. Because there are other economic benefits associated with the relief of migraine pain besides work productivity, this analysis is a conservative estimate of the benefit/cost relationship of sumatriptan. No specific information was given the appropriateness of the alternatives to sumatriptan for the treatment of acute migraine among those surveyed in this study (other than that patients were using a mix of non-sumatriptan migraine therapies). Given the cost differentials between the various treatments, it is likely that attempts would have been made to maximise the use of cheaper alternatives before sumatriptan was tried. If this was indeed the case then the most accurate impact of non-sumatriptan migraine therapies in terms of absenteeism and reduced work productivity is in the before estimate and the most accurate cost-benefit profile for sumatriptan has been revealed by this study. However, less than optimal use of cheaper alternatives prior to the initiation of sumatriptan treatment would have led to an overestimate of the benefits of sumatriptan. Potential confounders in this study are many, in particular changes in work practices and stress levels, which might have impacted, on the likelihood of participants developing migraine.

**Validity of estimate of measure of cost:**

The use of the human capital approach to measure the indirect costs of illness is not without controversy, which was acknowledged by the authors of this study. However, once again, since the perspective of the study was that of the employer, the use of the human capital-cost approach is justified in this case. A broader analysis of costs would have included a further range of direct medical costs for the prevention and treatment of migraine, for example the costs of other medications and non-drug interventions for migraine.
Other issues
All respondents received at least one prescription for sumatriptan during the year 1994 and telephone interviews for this study were conducted in July 1995. During these interviews patients were asked to describe their level of work productivity prior to the initiation of sumatriptan treatment. No specific time period over which these estimates were made (i.e. time since first sumatriptan dose) was specified in the report, but this is likely to have been at least 12 months on average. Recall bias is recognised as a limitation of the study. Other means of validating patients' estimates of productivity changes were considered by the authors but in the end self-reporting was deemed to be the best available method for measuring work productivity across the wide variety of occupations and employees involved. The oral formulation of sumatriptan was not available in the US at the time of this study. It is likely that, with such a formulation now available, the use of sumatriptan would have extended to less severe cases, with the likely result of reducing the benefit-to-cost ratio identified in this study.

Implications of the study
The availability of injectable sumatriptan for use among full-time employees for the acute treatment of migraine is likely to lead to cost savings to employers in terms of reduced absenteeism and productivity in the work place.

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