Disease-specific cost savings of treating nighttime versus daytime gastroesophageal reflux disease in an employed population
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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 estimate the impact of treatment compared with no treatment for patients with gastroesophageal reflux disease (GORD) and differentiate the economic benefits between those patients with night-time GORD and those with day-time GORD. The authors concluded that their results supported the use of PPI therapy based on the potential cost-savings that would accrue in a working population, particularly with night-time GORD. Despite some limitations, most methods and results were explicitly reported, and the authors’ conclusions are reasonable.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to estimate the impact of treatment compared with no treatment for patients with gastroesophageal reflux disease (GORD) and to differentiate the economic benefits between those patients with night-time GORD and those with day-time GORD.

Interventions
A hypothetical group of 10,000 patients was treated continuously with proton pump inhibitor (PPI) medications for GORD. The comparison group was 10,000 untreated patients. The PPI therapy involved the standard daily (maintenance) dose of PPI for symptomatic relief of heartburn and acid regurgitation. Dosage subsequently changed depending on the degree of symptom relief. At baseline, the population was distributed across four GORD severity groups (mild, moderate, severe and no symptoms).

Location/setting
USA/outpatient.

Methods
Analytical approach:
A decision analytic model constructed in Excel was used to synthesise published data and patient survey findings. The costs and effects were analysed over one year. The authors stated that the perspective was that of the employer.

Effectiveness data:
The data on effectiveness included symptomatic response rates at four weeks, symptom breakthrough rates at six months, and response rates after four weeks on daily double dose of PPI. Published systematic and comprehensive reviews of PPI efficacy studies were identified using a PubMed search. In addition, three experts were employed to provide a summary base value for each parameter based on the identified review findings. Experts also provided estimates on the distributions of symptom severity on treatment relapse (the percentages of mild, moderate and severe symptoms). The data on productivity losses due to GORD and following the treatment with PPI were derived from two publications (Dubois et al. 2007, and Elfant et al. 2006, see ‘Other Publications of Related Interest’ below for bibliographic details), and were valued using national average hourly earnings in 2005.

Monetary benefit and utility valuations:
None.
Measure of benefit:
The clinical outcomes were presented but were not synthesised with costs.

Cost data:
The cost types were drug costs, hospitalisation, emergency room and physician office visits, and tests and procedures relating to GORD. PPI drugs were valued using manufacturers' wholesale prices for 2005. Self-reported data relating to GORD treatment resources were derived using an online patient survey with a recall period of six months. The relative utilisation weights were obtained to allow published costs to be adjusted to make them more relevant to the authors' setting. Overall values for medical and procedure costs were taken from a published report (Dean et al. 2003, see ‘Other Publications of Related Interest’ below for bibliographic details). All costs were reported in 2005 US dollars ($).

Analysis of uncertainty:
Simple one-way sensitivity analyses were performed to assess uncertainty in cost and effectiveness estimates. These were based on high and low values from the literature or from expert opinion. The results of the sensitivity analyses were presented in a tornado diagram.

Results
The direct medical costs of day-time GORD were $10,525,939 for patients receiving treatment and $2,161,981 for no treatment. This compared with night-time GORD costs of $10,547,164 for patients receiving treatment and $2,340,596 for no treatment.

For the no treatment group, the cost savings from avoided productivity losses from PPI treatment were $15,695,660 for day-time GORD and $32,077,789 for night-time GORD. The net cost savings were $7,331,703 for day-time GORD and $23,871,221 for night-time GORD.

One-way sensitivity analyses indicated that, when the price of the daily dose of PPI exceeded $3.92, for the day-time GORD group, savings disappeared, but, for the night-time group, the results were robust between prices of $1 and $5 per day. The net cost savings for all GORD patients remained over all the plausible ranges analysed.

Authors' conclusions
The authors concluded that their model supported the use of PPI therapy based on the cost savings that would accrue in a working population with moderate to severe GORD, and particularly with night-time GORD.

CRD commentary
Interventions:
The two treatment options for GORD and the treatment schedule for the PPI treatment group over one-year were described and illustrated. The type of PPI agent and exact daily dosage was not reported. The profile of the intended patient population was briefly described.

Effectiveness/benefits:
The effectiveness data were derived from published reviews and were selected only if they reported symptom improvements. The data sources were fully described. The data for the differences between day- and night-time effectiveness of PPI were based on two reports. The merits and limitations of these studies were not reported and, as they are integral to the results of this analysis, readers should consult these studies to assess their quality.

Costs:
The costs were from the employer's perspective, and in the USA, this includes direct medical costs. The separation of direct medical and indirect productivity costs should be noted for other nations, which do not have employer-funded health care. The sources of costs were clearly reported. However, given the poor response rate on the patient survey (15.4%) for self-reported resource utilisation for GORD treatments, it is unclear whether the results reflect true resource utilisation. It is also unclear whether any inflationary adjustment was made to the direct costs taken from a paper published in 2003.
Analysis and results:
The cost and effect analyses were transparent and enable the reader to capture all assumptions made. These analyses did not test for the differences in costs and effects by night-time and day-time subgroups. However, the results of the sensitivity analyses were well-reported and illustrated. A probability sensitivity analysis may have measured uncertainty in parameter values more comprehensively. The study limitations were presented and discussed in detail by the authors.

Concluding remarks:
Despite some limitations with the quality of the data, estimates used, and simplistic sensitivity analyses, a reasonably transparent account of the methods was reported. The authors’ conclusions are likely to reflect the scope of the analysis.

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Bibliographic details

Other publications of related interest

Elfant AB, Lange SM, Doan QV, et al. Nighttime GERD and more severe GERD symptomatology are associated with greater work productivity loss. In: Digestive Disease Week (DDW). Los Angeles, CA, USA; 2006


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