Cost-effectiveness analysis of high-dose omeprazole infusion before endoscopy for patients with upper-GI bleeding

Tsoi KK, Lau JY, Sung JJ

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 evaluated the use of an intravenous proton-pump inhibitor (PPI) prior to endoscopy, for the management of patients with upper-gastrointestinal bleeding, compared with placebo. The authors concluded that a PPI before endoscopy was cost-effective for these patients. Despite the limited reporting of the effectiveness data, overall, the methodology was valid. The conclusions reached by the authors appear to be appropriate and reflect the limited scope of their analysis.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to estimate the cost-effectiveness of using a proton-pump inhibitor (PPI) before an endoscopy for the management of upper-gastrointestinal bleeding.

Interventions
The intervention was omeprazole (a PPI) at a dose of 80mg as an intravenous injection followed by 8mg per hour before endoscopy. Placebo was the comparator.

Location/setting
Hong Kong/secondary care.

Methods
Analytical approach:
A decision tree model, with a time horizon of 30 days, was used. The authors reported that the hospital perspective was adopted.

Effectiveness data:
The clinical data came from a single-centre, placebo-controlled, randomised trial, with 631 patients enrolled; 314 in the PPI group and 317 in the placebo group. The patient groups were comparable at baseline and the length of follow-up was 30 days. The primary clinical outcome was the number of endoscopic haemostasis therapies avoided within the follow-up period.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The authors used the number of patients who avoided endoscopic haemostasis therapy as the measure of benefit.

Cost data:
The economic analysis included the costs of medical treatment, diagnostic endoscopy, endoscopic haemostasis, emergency surgery, and hospitalisation. The resource use data were obtained directly from the clinical trial, and the unit costs were obtained from institutional and national sources. All costs were reported in US dollars ($) using an exchange rate from Hong Kong dollars of 7.8. The price year was not explicitly reported.
Analysis of uncertainty:
The parameter uncertainty was investigated, by varying the key clinical parameters and costs, in a one-way sensitivity analysis. Two-way sensitivity analysis was also conducted by varying the costs of both endoscopic therapy and hospitalisation.

Results
In the PPI group, 248 patients (79%) avoided endoscopic therapy compared with 227 patients (71.6%) in the placebo group. The estimated costs per patient were $2,813 in the PPI group and $2,948 in the placebo group.

The analysis demonstrated that PPI was the dominant strategy, as it was more effective and less costly than placebo.

The one-way sensitivity analysis demonstrated that if more than 11.9% of patients required endoscopic treatment or more than 8.3% of patients had peptic ulcer bleeding in the placebo group, PPI was the dominant strategy. However, these results were sensitive to variation in the hospitalisation costs and the number and cost of patients requiring endoscopic therapy.

Authors’ conclusions
The authors concluded that high-dose intravenous PPI before an endoscopy was effective and resulted in cost savings, compared with placebo, for the treatment of patients with upper-gastrointestinal bleeding.

CRD commentary
Interventions:
The authors chose placebo as the comparator for the intervention. This allowed the active value of the treatment to be evaluated, but no other active treatments were compared. If these exist, it means that the study was only a partial analysis.

Effectiveness/benefits:
The use of a randomised controlled trial (RCT) to derive the clinical data was appropriate, given the strengths of its design. It was not clear that this RCT was the best available evidence; there may have been other relevant RCTs that could have contributed evidence. Some details of the RCT, such as the inclusion and exclusion criteria, randomisation procedures, and power calculations to ensure an appropriate sample size, were not reported, which makes it difficult to make an objective assessment of the validity of the data. The patient groups were reported to have been comparable at baseline, which make the comparison more robust, but no statistical analysis was reported. The authors used a disease-specific outcome for the measure of benefit, which prevents an assessment of the impact on the intervention on the patients’ quality of life and hinders cross-disease comparisons.

Costs:
The costs appeared to reflect the perspective adopted. The unit costs and resource quantities were presented separately. Apart from the fact that the price year was not reported, which will make any future reflation exercises difficult, the economic analysis was carried out transparently.

Analysis and results:
The synthesis of the costs and benefits was appropriately performed. The issue of uncertainty was partially addressed using a deterministic approach, but a probabilistic approach would have strengthened the findings. The authors acknowledged the limitations of their study relating to the generalisation of the results and the disease-specific measure of benefit.

Concluding remarks:
Despite the limited reporting of the effectiveness data, overall, the methodology was valid. The conclusions reached by the authors appear to be appropriate and reflect the limited scope of their analysis.

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