Cost-effectiveness of treatment regimens for the eradication of Helicobacter pylori in duodenal ulcer

Vakil N, Fennerty M B

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
Treatment regimes for the eradication of Helicobacter pylori in duodenal ulcer: 2-weeks triple drug therapy (metronidazole, bismuth, tetracycline with H2 receptor antagonist); 2-weeks omeprazole and amoxicillin; 2-weeks omeprazole and clarithromycin. The comparator was traditional H2 receptor antagonist therapy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population was a hypothetical cohort of patients with duodenal ulcer. No further details were given.

Setting
Hospital. The economic study was carried out in Milwaukee, WI, USA.

Dates to which data relate
The main effectiveness data were derived from previously published studies dated 1992-95. Resource and cost data were obtained mainly from 1994-95 sources. The price year was 1994.

Source of effectiveness data
The baseline values used as inputs to the decision tree (ulcer recurrence rate, eradication rate, compliance rate and drug resistance) were derived from previously published studies.

Modelling
A decision tree was developed to clarify which regimen is optimal in clinical practice.

Outcomes assessed in the review
The outcomes assessed were ulcer recurrence rate, eradication rate, compliance rate and drug resistance.

Study designs and other criteria for inclusion in the review
No specific study designs were stipulated by the authors as inclusion criteria.
Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
33 primary studies were included in the review.

Methods of combining primary studies
Narrative method.

Investigation of differences between primary studies
Not stated.

Results of the review
The eradication rate was 0% in H2 receptor, 90% in triple therapy, 55% in omeprazole plus amoxicillin and 78% in omeprazole plus clarithromycin. A 2% ulcer recurrence rate was estimated for all groups. The compliance rate was 95% in H2 receptor, 65% in triple therapy, 95% with omeprazole plus amoxicillin and 95% with omeprazole plus clarithromycin. The drug resistance was estimated to be 24%.

Measure of benefits used in the economic analysis
The principal benefit was the reduction in treatment costs.

Direct costs
Treatment of recurrence and drugs costs were included in the analysis. Quantities and costs were reported separately. Discounting was not undertaken. The quantity/cost boundary was the hospital. The price year was 1994.

Statistical analysis of costs
Not undertaken.

Currency
US dollars ($).

Sensitivity analysis
A one-way sensitivity analysis was carried out on the cost of H2 receptor antagonist, metronidazole resistance and compliance, dual drug regimes and endoscopy rates.

Estimated benefits used in the economic analysis
Not applicable.
Cost results
The expected costs were $1,791 for H2 receptor, $1,028 for triple therapy, $768 for omeprazole plus amoxicillin and $720 for omeprazole plus clarithromycin.

Synthesis of costs and benefits
Costs and benefits were not combined. H2 receptor antagonists were not cost-effective even if maintenance therapy costs dropped to $1. Triple drug therapy was the optimal regimen in areas where metronidazole resistance rates were less than 36% and compliance was greater than 53%. Omeprazole and amoxicillin was not cost-effective unless eradication rates was greater than 74%. Dual drug therapy with omeprazole and clarithromycin was effective in regions where metronidazole resistance was high or where it was anticipated that there would be poor compliance with the more complicated triple drug therapy regimen.

Authors' conclusions
Treatment to eradicate H. pylori in infected patients with duodenal ulcer is a less expensive strategy than traditional therapy with H2 receptor antagonists.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear. The precise regimen for eradication of the organism remains uncertain due to the wide variety of regimens described, variable results with some regimens and difficulties in predicting and measuring drug compliance. You, as a user of this database, should consider whether these are widely used health technologies in your own setting.

Validity of estimate of measure of effectiveness
The validity of the review outcome measures is difficult to assess given that neither the specific study designs included nor the sources searched to identify primary studies were reported by the authors.

Validity of estimate of measure of benefit
The estimate of measure of benefit used in the economic analysis was based on costs alone.

Validity of estimate of costs
Resource and cost data were reported separately and adequate details of methods of quantity/cost estimation were given. Important cost items do not appear to have been omitted.

Other issues
The issue of generalisability to other settings or countries was not addressed, although appropriate comparisons were made with other studies in terms of the influence of duration of follow-up (> 2 years) on the cost-effectiveness of the different regimes. The modelled solutions were tested using sensitivity analysis in order to validate the robustness of the findings.

Implications of the study
Further research is required to analyse the effect of higher resistance rates (typical of developing countries) on the choice of an optimal regimen.

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