Helicobacter pylori eradication in long-term proton pump inhibitor users is highly cost-effective: economic analysis of the HELPUP trial

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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 examine the clinical and economic impact of Helicobacter pylori eradication in long-term users of proton pump inhibitors in comparison with no eradication. The authors concluded that eradication was economically a dominant strategy, with a significant reduction in health care costs and symptom severity. The study appears to have been based on valid sources of data and on good methodology, which makes the authors’ conclusions more robust.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to examine the clinical and economic impact of Helicobacter pylori (H. pylori) eradication in long-term users of proton pump inhibitors (PPIs).

Interventions
The strategy of one week of H. pylori eradication therapy was compared with no eradication, in the form of placebo.

Location/setting
UK/primary care.

Methods
Analytical approach:
This economic evaluation was based on a single study with a two-year time horizon. The authors stated that the perspective of the National Health Service was adopted.

Effectiveness data:
The clinical evidence came from the H. pylori Eradication in Long-term Proton pump inhibitor Users in Primary care (HELPUP) trial. This was a double-blind, parallel group, randomised trial, which enrolled 184 eligible patients in 13 primary care practices in the North East of England. The length of follow-up for clinical outcomes was one year. Further details of the trial were not reported. The primary clinical estimate was the improvement in dyspepsia symptoms, measured by the Leeds Dyspepsia Questionnaire.

Monetary benefit and utility valuations:
The data on quality of life were measured at baseline and after 12 months, using the European Quality of life questionnaire (EQ-5D), for all patients enrolled in the HELPUP trial.

Measure of benefit:
The summary benefit measures were the improvement in dyspepsia symptoms measured by the Leeds Dyspepsia Questionnaire (LDQ), improvement in reflux symptoms measured by the Carlsson and Dent reflux questionnaire, and quality of life. The two clinical endpoints were assessed over a one-year time horizon.

Cost data:
The economic analysis included the costs of PPIs, eradication therapy, carbon 13-urea breath test, visits to the general practitioner (GP), GP home visits, accident and emergency department visits, hospital admissions, ultrasound of the
abdomen, endoscopy, colonoscopy, endoscopic retrograde cholangiopancreatography, computed tomography, and magnetic resonance imaging. The resource use was estimated from the clinical trial using two-year follow-up data. The unit costs were reported and were derived from official UK price lists such as the British National Formulary, the National Schedule Reference Costs, and the Personal Social Services Research Unit. All costs were in UK pounds sterling (£) and the price year was 2006.

Analysis of uncertainty:
A deterministic sensitivity analysis was undertaken to determine the impact of variations in the unit costs, prevalence of disease, and eradication rates on the magnitude of the cost savings. The alternative values used in the analysis appear to have been selected by the authors. In addition, bootstrapping was performed to generate 95% confidence intervals (CIs) around the costs and benefits.

Results
The eradication strategy led to a net cost saving of £93 (95% CI: £33 to £153) in comparison with no eradication. In fact the incremental cost of the eradication therapy (£101) was more than offset by the reduction in other resource use (£194), mainly GP consultations, PPIs, and endoscopies.

The dyspepsia symptoms improved by approximately 20% in the eradication group compared with the no eradication group (LDQ: -3.1, 95% CI: -5.3 to -0.9).

Quality of life was better with eradication (EQ-5D: 0.089, 95% CI: -0.012 to 0.191), and the visual analogue scale (VAS) within the EQ-5D showed significant improvement in self-rated health with eradication (VAS: 5.6, 95% CI: 2.1 to 9.1). Thus, the eradication strategy was dominant (less expensive and more effective than no eradication).

The sensitivity analysis showed that the intervention remained cost-saving, or became cost-neutral, under most scenarios.

Authors' conclusions
The authors concluded that H. pylori eradication was economically a dominant strategy, offering significant reduction in health care costs and symptom severity.

CRD commentary
Interventions:
The authors justified their selection of the comparators, which represented the current pattern of care (no eradication) and a strategy used in practice (eradication therapy).

Effectiveness/benefits:
The evidence came from a randomised trial, which is considered to be a valid and robust source of clinical data given the strengths of its design. The analysis was based on the intention-to-treat, which further strengthens the study. Little information on the primary study was provided because this was published elsewhere. The benefit measures were derived directly from the sample of patients enrolled in the study and included both disease-specific outcomes and quality of life measures.

Costs:
The categories of costs were consistent with the perspective. The unit costs and quantities of resources used were presented separately and the price year was provided. Statistical analyses of costs were carried out, not only to determine the statistical significance of cost differences, but also to derive precise estimates by means of bootstrapping. In general, the economic analysis was well reported.

Analysis and results:
A synthesis of the costs and benefits was not required given the dominance of one strategy over the other. The issue of uncertainty was restricted to the factors that might have affected the cost results. The findings were reported extensively. The authors noted that their findings were relevant to different stakeholders (patients, clinicians, and policy makers). They also noted some limitations of their analysis such as the use of evidence from a single medium-sized trial.
and the need for some assumptions.

Concluding remarks:
The study appears to have been based on valid sources of data and on sound methodology, which makes the authors’ conclusions more robust.

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