Test and treat strategies for Helicobacter pylori in uninvestigated dyspepsia: a Canadian economic analysis

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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
Test and treat strategies for Helicobacter pylori in uninvestigated dyspepsia.

Type of intervention
Screening and treatment.

Economic study type
Cost-effectiveness analysis.

Study population
A hypothetical cohort of 1,000 patients aged less than 50 years who had presented to their primary care practitioner with a new complaint of dyspepsia, and who did not use non-steroidal anti-inflammatory drugs.

Setting
Primary care and hospital. The study was set in Canada.

Dates to which data relate
Effectiveness and resource use data were collected from studies published between 1987 and 1998. Cost data were collected from 1995 and 1999. The price year was 1997.

Source of effectiveness data
Effectiveness data were derived from a literature review.

Modelling
A one-year decision analytic model was used to determine the cost-effectiveness of the three test and treat strategies.

Outcomes assessed in the review
The review assessed the prevalence of H. pylori and peptic ulcer disease (PUD), the sensitivity and specificity of the tests, the effectiveness of H. pylori eradication, PUD healing, the recurrence rate of PUD, and the relapse rate of non-ulcer dyspepsia (NUD).

Study designs and other criteria for inclusion in the review
Not stated.
Sources searched to identify primary studies
Articles were identified from searches of MEDLINE (1966-1998) and from hand searches of recent review article bibliographies.

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

Methods used to judge relevance and validity, and for extracting data
Summary statistics from individual studies were used.

Number of primary studies included
At least 18 studies were included.

Methods of combining primary studies
Narrative method.

Investigation of differences between primary studies
Not stated.

Results of the review
The prevalence of H. pylori infection among dyspeptic patients was 30%. The prevalence of PUD was 0.35 if H. pylori-positive and 0.03 if H. pylori negative. The sensitivity of C-UBT was 0.96 and the specificity was 0.98. The sensitivity of serology was 0.85 and the specificity was 0.79. The effectiveness of H. pylori eradication was 90%. With successful eradication, 95% of ulcers would heal compared to 76% if eradication failed. A four-week course of ranitidine would heal 70% of ulcers, while a six-week course of omeprazole monotherapy would heal 90%. H. pylori-negative patients who were given eradication therapy in error had an ulcer healing rate of 85%. The one-year recurrence rate of H. pylori-positive PUD, without maintenance therapy, was 70%, while that following successful eradication was 4%. 75% of ulcers were symptomatic and 1% of new ulcers presented with complications such as bleeding or perforation. The one-year symptomatic relapse rate regardless of therapy was 65%.

Measure of benefits used in the economic analysis
The expected number of H. pylori-eradicated ulcers was used as the measure of benefits.

Direct costs
Direct costs were not discounted given the short time frame of the study (less than 1 year). Quantities and costs were reported separately. Direct costs included eradication costs, costs of ranitidine and omeprazole, outpatient endoscopy costs, costs of C-UBT and serology, costs of primary care visits, specialist consultations, and follow-up visits. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on actual data. Drug costs were determined through a survey of local pharmacies. Costs for physician services were taken from the Ontario Ministry of Health Schedule of Benefits. The costs of outpatient endoscopy, endoscopic biopsy and RUT were derived from the Hamilton Health Sciences Corporation costing model.

Statistical analysis of costs
No statistical analysis of costs was reported.
Indirect Costs
Indirect costs were not included.

Currency
Canadian dollars (Can$) with Can$1 = US$0.70.

Sensitivity analysis
One-way and two-way sensitivity analyses were conducted on all effectiveness and cost estimates used in the model.

Estimated benefits used in the economic analysis
The number of endoscopies per 1,000 patients was 629 with the C-UBT strategy, 649.4 with serology, and 700.2 with ranitidine. The number of H. pylori eradication regimens prescribed per 1,000 patients was 433.8 with the C-UBT strategy, 448.6 with serology, and 200.1 with ranitidine. The number of H. pylori-positive peptic ulcers was 53 per 1,000 patients with ranitidine, 128 per 1,000 patients with C-UBT, and 92 per 1,000 patients with serology.

Cost results
Medical costs per patient were Can$598 with ranitidine, Can$635 in the C-UBT strategy, and Can$603 in the serology strategy.

Synthesis of costs and benefits
The incremental cost-effectiveness of serology over ranitidine was Can$118 per additional ulcer cure, while that of C-UBT over serology was Can$885 per cure. The serology strategy became dominant over ranitidine when the cost of serology fell below Can$16. C-UBT became dominant over serology when its cost fell to Can$39 and serology cost Can$25.

Authors' conclusions
In low risk patients with uninvestigated dyspepsia, testing for H. pylori using serology appears to be economically attractive. C-UBT may be a cost-effective alternative to serology if local conditions closely approximate the model parameters.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparators used, namely they were current therapies. You, the user of the database, should decide if these health technologies are relevant to your setting.

Validity of estimate of measure of benefit
The authors did not state that a systematic review of the literature had been undertaken. More details could have been provided about the design of the review and the method of combining primary effectiveness estimates. The estimation of benefits was obtained directly from the effectiveness analysis. Extensive sensitivity analyses on the results were undertaken to test for variability in the data used to populate the model.

Validity of estimate of costs
Good features of the analyses were that all relevant cost categories were included, quantities and costs were reported separately, sensitivity analyses were conducted on costs and on quantities, cost estimates were not based on charges, and the price year was reported. All of these features would tend to increase the generalisability of the results. Indirect or intangible costs of discomfort and inconvenience associated with the test and treat strategies were not considered.
Other issues
The authors did not make appropriate comparisons of their findings with those from other studies, but the issue of generalisability to other settings was addressed. The authors did not present their results selectively. The study examined patients with uninvestigated dyspepsia and this was reflected in the authors’ conclusions. Improvement in dyspeptic symptoms after eradication was not considered. The time horizon was limited to one year and costs and consequences after the first recurrence of symptoms were not modelled.

Implications of the study
While the C-UBT warrants consideration in the evaluation of patients with uninvestigated dyspepsia, close attention must be paid to local variation in costs and outcomes if it is to be accepted as a cost-effective first-line test in test and treat strategies.

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