Which test is best for Helicobacter pylori? A cost-effectiveness model using decision analysis

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
The study considered urea breath, serology and monoclonal faecal tests for the diagnosis of Helicobacter pylori (H. pylori).

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with suspected H. pylori.

Setting
The setting was primary care. The economic study was carried out in the UK.

Dates to which data relate
The dates to which the clinical effectiveness and resource use data referred were not provided in the paper. No price year was reported.

Source of effectiveness data
The clinical data used in the model were the sensitivity and specificity of the three tests and the prevalence of H. pylori.

Modelling
A decision analysis model with a 3-month time horizon was used. Details of the model parameters (sensitivity, specificity and costs) were presented in the paper.

Sources searched to identify primary studies
The clinical model parameters were derived from a published study (see 'Other Publications of Related Interest' below for bibliographic details). No details of the study design were given in the paper.

Methods used to judge relevance and validity, and for extracting data
A multidisciplinary workshop of 24 health professionals, who were given details of the diagnostic test sensitivity and specificity, established the model parameters. The sensitivity and specificity of the diagnostic tests were obtained from the published study that provided the clinical data. Reasons for the selection of this particular published study were not
Measure of benefits used in the economic analysis
The measure of health benefit used was the number of true test results. This data were taken from the model.

Direct costs
The direct costs of the NHS were identified. These included the costs of the diagnostic tests, eradication treatment and the cost of a missed diagnosis (including a gastroscopy), 2 months of proton-pump inhibitors, and an extra general practitioner visit. Resource use was assessed by the panel of health professionals assembled at the workshop. The sources of the unit costs were not reported. A breakdown of the unit costs was provided, but resource use was not included. No price year was reported in this paper.

Statistical analysis of costs
No statistical analysis of the quantities or costs was reported in this paper.

Indirect Costs
No productivity costs were included in the study.

Currency
UK pounds sterling (€).

Sensitivity analysis
In order to examine uncertainty in the model parameters, one-way sensitivity analyses and tornado analyses were undertaken. The ranges used in the sensitivity analyses, but not their sources, were reported in the paper.

Estimated benefits used in the economic analysis
The number of true test outcomes was 903 per 1,000 for the serology test, 961 per 1,000 for the breath test, and 968 per 1,000 for the faecal antigen test.

Cost results
The total cost was 16,600 per 1,000 serology tests, 23,175 per 1,000 breath tests, and 17,275 per 1,000 faecal antigen tests.

Synthesis of costs and benefits
The average cost-effectiveness ratio was 17.84 per true result for the faecal antigen test, 18.38 per true result for the serology test, and 24.12 per true result for the breath test.

In the incremental cost-effectiveness analysis, the breath test was dominated by the faecal antigen test. This means that the breath test was less effective and more costly than the faecal antigen test.

The incremental cost-effectiveness of the faecal test compared with the serology test was 10 per true result.

The tornado analysis showed that the variable with greatest influence was the prevalence of H. pylori.

The one-way sensitivity analysis showed that, if the prevalence of H. pylori was varied between 20 and 40% and the cost of a missed diagnosis was varied between 500 and 0, the faecal test remained the most cost-effective option.
Authors’ conclusions
The faecal antigen test was the most cost-effective diagnostic test for Helicobacter pylori (H. pylori) in primary care.

CRD COMMENTARY - Selection of comparators
This study compared serology, breath and faecal tests for the diagnosis of H. pylori in primary care. These options were chosen as there was no guidance from the National Institute for Health and Clinical Excellence as to the preferred diagnostic test, and the three diagnostic tests studied represented the options currently available in the authors’ setting. You should consider how these three options compare with usual practice in your own setting prior to applying the results of this study.

Validity of estimate of measure of effectiveness
The model parameters were established in a multi-disciplinary workshop of health professionals using a published study. No details of how this study was identified, or the methods it used, were included in this paper. It is therefore difficult to comment on the appropriateness of this choice.

Validity of estimate of measure of benefit
The measure of benefit used in the economic analysis was the number of true test results, and data were taken from the model. This choice means it will be possible to compare the results of this study with those from other diagnostic studies. However, the measure of benefit does not fully capture the relevant health outcomes.

Validity of estimate of costs
The costs to the NHS were identified in this study and all appropriate costs appear to have been included. Resource use was determined by a multi-disciplinary panel. Uncertainty around the data was explored using sensitivity analyses and a breakdown of the unit costs was provided. These factors enhance the generalisability of the study findings. However, resource use was not specified clearly and the date to which the data referred was not reported. No price year was reported, which will hinder any future reflation exercises.

Other issues
The authors do not appear to have presented the results selectively and their conclusions reflected the scope of the analysis. They did not compare their findings with those from other similar studies, nor did they consider the implications of applying the results to other settings.

Implications of the study
The authors did not make any recommendations for further research. They recommended the adoption of the faecal antigen test.

Source of funding
Funded by the National Leadership and Innovation Agency Wales, Welsh Assembly Government.

Bibliographic details

PubMedID
17504592

Other publications of related interest
Because readers are likely to encounter and assess individual publications, NHS EED abstracts reflect the original publication as it is written, as a stand-alone paper. Where NHS EED abstractors are able to identify positively that a publication is significantly linked to or informed by other publications, these will be referenced in the text of the abstract and their bibliographic details recorded here for information.


Indexing Status
Subject indexing assigned by NLM

MeSH
Antigens, Bacterial /isolation & purification; Bacteriological Techniques /economics /standards; Breath Tests; Cost-Benefit Analysis; Decision Support Techniques; Diagnostic Techniques, Digestive System /economics /standards; Dyspepsia /economics /microbiology; Feces /microbiology; Helicobacter Infections /diagnosis /economics; Helicobacter pylori /isolation & purification; Hematologic Tests /economics; Humans; Predictive Value of Tests; Sensitivity and Specificity

AccessionNumber
22007008136

Date bibliographic record published
31/10/2007

Date abstract record published
31/10/2007