Cost-effectiveness of noninvasive testing and treatment strategies for H. pylori infection in children with dyspepsia

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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
Noninvasive testing and treatment strategies for Helicobacter pylori infection.

Type of intervention
Screening and treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Hypothetical population of 1,000 children with dyspepsia.

Setting
Primary and secondary care. The study was carried out in the USA and Finland.

Dates to which data relate
Effectiveness and resource use data were retrieved from studies previously published between 1988 and 1995. The price year was 1996.

Source of effectiveness data
Effectiveness data were derived from a review of previously published studies.

Modelling
A decision analysis tree and a Monte Carlo simulation (1,000 trials) were used to model costs and outcomes of the testing and treatment strategies. The time frame was 1 year.

Outcomes assessed in the review
The following outcomes were assessed in the review: the prevalence of H. pylori infection, the symptomatic cure rate, the sensitivity and specificity of serological testing and antibiotic therapy, and the eradication rate.

Study designs and other criteria for inclusion in the review
Not stated.
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
Approximately 14 primary studies were included.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not stated.

Results of the review
The authors assumed a 30% prevalence of H. pylori infection in children with dyspepsia (range tested: 5 - 55%). The symptomatic cure rate was assumed to be 28% (range tested: 5 - 55%). A base case sensitivity and specificity of 95% for serology and 98% for the urea breath test were used. The eradication rate (95%) was based on a course of standard bismuth-based triple therapy (range tested: 65 - 95%).

Measure of benefits used in the economic analysis
The benefit measure used was the number of patients cured of symptoms by each strategy.

Direct costs
Costs were not discounted given the time frame of the study (1 year). Quantities and costs were not reported separately. Direct costs included the costs associated with the testing and treatment procedures. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on actual data. Actual reimbursement data were used for procedural costs. The price year was 1996.

Statistical analysis of costs
Not reported.

Indirect Costs
Not included.

Currency
US dollars ($).

Sensitivity analysis
One-way sensitivity analysis was conducted on the prevalence rate and costs. Two-way sensitivity analysis was conducted on the prevalence rate and the proportion of patients cured of symptoms by eradication of H. pylori.

**Estimated benefits used in the economic analysis**
Not reported.

**Cost results**
The mean expected costs of serology were $642 (+/- 151) in the United States and $192 (+/- 68) in Finland. The mean expected costs of endoscopy were $643 (+/- 68) in the United States and $174 (+/- 69) in Finland. The mean expected costs of empirical treatment were $665 (+/- 171) in the United States and $234 (+/- 45) in Finland. The mean expected costs of C urea breath testing were $899 (+/- 152) in the United States and $207 (+/- 67) in Finland.

**Synthesis of costs and benefits**
The incremental costs over endoscopy per patient cured of symptoms in the United States were $126 for C urea breath testing, $49 for empirical therapy, and $11 for serology. The incremental costs over endoscopy per patient cured of symptoms in Finland were $174 for C urea breath testing, $86 for empirical therapy, and $45 for serology. If prevalence is low and cure rates are low, serological testing and treatment are not cost-effective.

**Authors’ conclusions**
In developed countries, significant cost savings are unlikely with an initial test and treat strategy based on serology. Non-invasive testing and treatment of H. pylori infection can be cost-effective in populations with highly prevalent rates of infection (>53%).

**CRD COMMENTARY - Selection of comparators**
The rationale for the choice of the comparators was clear.

**Validity of estimate of measure of benefit**
The measure of benefit chosen was the proportion of patients cured of symptoms. Alternatively, if one allows for the possibility of re-infection, the average time spent without symptoms could have been used as a measure of benefit. Unfortunately, the authors did not report results for the benefit measure. The authors noted in their discussion that their model did not consider the C urea breath test, which (at the time of writing) is not widely available in the United States. This may offer both clinical and economic benefits to children due to the avoidance of sedation in alternative procedures.

**Validity of estimate of costs**
Only direct costs were included. Reimbursement data were used which do not always represent true opportunity costs. No statistical analysis of costs was performed. Costs of complications and side-effects of antibiotic therapy and costs of creating drug-resistant strains by empirical therapy were not included in the model estimates.

**Other issues**
The time frame of the decision tree analysis and Monte Carlo simulation could have been extended beyond one year. The results depend heavily upon the prevalence rate and symptomatic cure rate and there is a great deal of variability in these rates across countries. Hence, the reader should assess whether the values adopted in this study apply to his or her setting or country.

**Implications of the study**
The authors argue for further clinical trials which are able to clarify the role of H pylori eradication in dyspeptic children.

**Source of funding**
None stated.

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Other publications of related interest


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