Is upper gastrointestinal radiography a cost-effective alternative to a Helicobacter pylori "test and treat" strategy for patients with suspected peptic ulcer disease?

Rich M, Scheiman J M, Tierney W, Fendrick A M

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
Upper gastrointestinal radiography for patients with suspected peptic ulcer disease (PUD).

Type of intervention
Diagnosis and treatment.

Economic study type
Cost-effectiveness analysis.

Study population
A hypothetical cohort of 1,000 patients with uncomplicated ulcer-like dyspepsia who were not taking non-steroidal anti-inflammatory agents.

Setting
Hospital. The study was carried out in the USA.

Dates to which data relate
Effectiveness and resource use data were collected from studies published between 1975 and 1998. The dates to which cost data refer and the price year were not reported.

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

Modelling
A decision analytic model was used to determine the cost-effectiveness of the three diagnostic and treatment strategies.

Outcomes assessed in the review
The review assessed the epidemiology of ulcer disease, the sensitivity and specificity of diagnostic strategies, and the effectiveness of eradication therapy.

Study designs and other criteria for inclusion in the review
Study designs and other criteria for inclusion were not stated.
Sources searched to identify primary studies
Data were obtained from a MEDLINE database search and a review of peer-reviewed journals not included in the database.

Criteria used to ensure the validity of primary studies
Criteria to ensure the validity of primary studies were not stated.

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

Number of primary studies included
At least 51 studies were included.

Methods of combining primary studies
A narrative method was used.

Investigation of differences between primary studies
Not stated.

Results of the review
50% of the cohort entered into the model were regarded as being infected with HP. 20% of the cohort had active PUD. The percentage of patients with active PUD who were infected with HP was 90%. The qualitative serology test had a 90% sensitivity and 95% specificity. Rapid urease testing (RUT), performed with endoscopy in persistently symptomatic patients, had a 92% sensitivity and a 92% specificity. Endoscopy was 100% sensitive and specific in the detection of PUD. UGI had a 90% sensitivity and 90% specificity for detection of PUD. HP eradication rates were estimated at 85% and ulcer healing was estimated at 90%. After ulcer healing, 10% of ulcer related symptoms recurred. Ulcer recurrence with and without HP infection were estimated at 2.7% and 0.6% per 100 patient-months, respectively. For those individuals whose symptoms were not due to active ulcer disease, symptoms recurred at the rate of 30% after a course of antisecretory therapy and required a physician visit. These data formed the principal epidemiological and effectiveness for the model.

Measure of benefits used in the economic analysis
Each strategy led to an equivalent number of symptomatic ulcers cured because of the required endoscopic evaluations for patients with persistent symptoms. Hence, the analysis of benefits was based upon the therapeutic equivalence of diagnostic and treatment strategies. As such, a cost-minimisation analysis was performed.

Direct costs
Direct costs were not discounted given the short time frame of the study (1 year). Quantities and costs were reported separately. Direct costs included costs of diagnostic tests, physician visits, pharmaceutical use, procedures, and hospitalisations. The quantity/cost boundary adopted was that of the hospital. The estimation of quantities and costs was based on actual data. The costs of antisecretory therapy and HP eradication therapy were obtained from a University hospital pharmacy. The price year was not reported.

Statistical analysis of costs
A statistical analysis of costs was not reported.
Indirect Costs
Indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were conducted on clinical and cost inputs including UGI cost, UGI performance, and HP prevalence.

Estimated benefits used in the economic analysis
Each strategy led to an equivalent number of symptomatic ulcers cured because of the required endoscopic evaluations for patients with persistent symptoms.

Cost results
The cost results are incorporated in the synthesis of costs and benefits reported below.

Synthesis of costs and benefits
The treatment cost per ulcer cured was $3,025 for test and treat, $3,690 for initial UGI, and $3,790 for initial UGI with serology. The cost per patient treated was $498 for test and treat, $610 for UGI and $620 for UGI with serology. When UGI reimbursement was decreased to less than $50, the UGI strategies yielded a lower cost per patient treated than the test and treat strategy.

Authors’ conclusions
At current reimbursement levels, UGI should not be considered a cost-effective alternative to the HP test and treat strategy for the initial evaluation of patients with suspected peptic ulcer disease.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparator used, namely currently available diagnostic and treatment strategies. You, as a 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 whether a systematic review of the literature had been undertaken, although, the methods and conduct of the review appear to have been comprehensive and are well reported. Effectiveness estimates were derived credibly from primary studies. The analysis of benefits was based upon therapeutic equivalence of diagnostic and treatment strategies. The analysis therefore included only costs and should be regarded as a cost-minimisation study.

Validity of estimate of costs
All categories of cost relevant to the perspective adopted were included in the analysis. Treatment costs for non-PUD etiologies of dyspepsia were excluded. Costs of a follow-up endoscopy and RUT after UGI were not included if the patient remained asymptomatic. Indirect costs, although relevant, were not considered. Quantities and costs were reported separately. Appropriate sensitivity analyses were conducted on quantities and costs. Payments and not charges were used to determine cost estimates. A limitation of the cost analysis was that the price year was not reported.

Other issues
The authors did make appropriate comparisons of their findings with those from other studies. However, the issue of generalisability to other settings was not specifically addressed. The authors do not appear to have presented their results selectively. The study analysed patients with suspected peptic ulcer disease and this was reflected in the authors’ conclusions. The model did not assess the societal costs of antibiotic resistance and did not include any benefit of HP eradication other than decreased ulcer recurrence, such as potential reduced risk of gastric carcinoma or ulcer prevention in HP infected individuals without active PUD. These considerations ought, where possible, to be included in future studies in this area.

**Implications of the study**

UGI, under current reimbursement levels in the USA, should not be considered a cost-effective alternative to the HP test and treat strategy for the initial evaluation of patients with suspected peptic ulcer disease.

**Source of funding**

None stated.

**Bibliographic details**


**PubMedID**

10710053

**DOI**

10.1111/j.1572-0241.2000.01837.x

**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

Anti-Ulcer Agents /economics /therapeutic use; Cohort Studies; Cost-Benefit Analysis; Helicobacter Infections /drug therapy /economics /radiography; Helicobacter pylori; Humans; Models, Economic; Peptic Ulcer /drug therapy /economics /radiography; Predictive Value of Tests; Recurrence; Sensitivity and Specificity

**AccessionNumber**

22000000575

**Date bibliographic record published**

31/01/2001

**Date abstract record published**

31/01/2001