Endoscopic retrograde cholangiopancreatography: diagnostic performance
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Authors' objectives
To evaluate the diagnostic and therapeutic effectiveness of endoscopic retrograde cholangiopancreatography (ERCP) for common bile duct stones, pancreaticobiliary malignancy, pancreatitis and abdominal pain of possible pancreaticobiliary origin. This abstract will concentrate on the diagnostic performance; a separate abstract addresses the therapeutic effectiveness (DARE abstract number 12005008412).

Searching
MEDLINE, BIOSIS Previews, EMBASE, and SciSearch were searched from 1980 to August 2001; the search terms were reported. The bibliographies of key articles were checked, and the technical advisory group were contacted for further studies. Studies published in English as full-text articles in peer-reviewed journals, or abstracts published since 1999, were included in the review.

Study selection
Study designs of evaluations included in the review
Prospective studies, or retrospective studies where patients were enrolled consecutively with appropriate sampling methods, with a minimum of 25 participants, were eligible for inclusion.

Specific interventions included in the review
Studies of ERCP were eligible for inclusion.

Reference standard test against which the new test was compared
Eligible studies had to compare two ERCP alternatives, or ERCP with endoscopic ultrasound (EUS), magnetic resonance cholangiopancreatography (MRCP), intra-operative cholangiography, or other diagnostic tests advised by the technical advisory group. Studies using only non-breath hold MRCP were excluded.

Participants included in the review
Studies of patients with suspected common bile duct stones, pancreaticobiliary malignancy, pancreatitis or abdominal pain of possible pancreaticobiliary origin, where all patients had undergone both ERCP and the diagnostic alternative, were eligible for inclusion.

Outcomes assessed in the review
The studies had to report sufficient data to construct a 2x2 contingency table.

How were decisions on the relevance of primary studies made?
One reviewer screened studies for relevance, with a second reviewer checking those where inclusion was deemed uncertain; any disagreements were resolved by consensus or through discussion with the Programme Director or members of the Technical Advisory Group, if required.

Assessment of study quality
Study quality was assessed in relation to the patient spectrum and selection, and the independence of interpretation of test results. The studies were rated as good, fair or poor (details were reported). The authors did not state how many reviewers performed the validity assessment.

Data extraction
One reviewer extracted the data from the primary studies and a second reviewer checked the accuracy of the data. Any disagreements were resolved by consensus or by consultation with members of the technical advisory group.
Sensitivities, specificities, and positive and negative predictive values were calculated.

**Methods of synthesis**

**How were the studies combined?**
The studies were combined in a narrative, ordered by diagnosis.

**How were differences between studies investigated?**
Study details and results were tabulated, and any differences between the studies were discussed in the text.

**Results of the review**

In total, 149 studies met the inclusion criteria; it appeared that 58 studies were included in the assessment of diagnostic performance.

Common bile duct stones (25 studies, n=1,701).

Thirteen studies were rated as good quality and 10 as fair; the results for a further 2 studies were not reported.

The results of ERCP appeared similar to both MRCP (10 studies, n=834) and EUS (9 studies, n=601), with sensitivities and specificities over 90% in most studies for all three diagnostic techniques.

ERCP seemed to have a better sensitivity and specificity than computed tomography cholangiography, although the magnitude of this difference was not determined (6 studies, n=266).

Pancreaticobiliary malignancy (27 studies, n=1,611).

Ten studies were rated as good quality and 17 as fair.

Twelve studies compared at least two tissue sampling techniques. ERCP bile cytology was generally more sensitive than ERCP brush cytology (5 studies, n=178). The results were similar for fine-needle aspiration cytology and brush cytology (3 studies, n=193), and similar or higher for forceps biopsy compared with brush cytology (6 studies, n=437).

Fifteen studies compared ERCP with alternatives. One study reported ERCP as having a substantially higher sensitivity (100%) than percutaneous transhepatic cholangiography (43%); a second reported similar sensitivities. There were no significant differences in the diagnostic performance of ERCP, MRCP or EUS for the diagnosis of malignancy and/or stricture.

Pancreatitis (3 studies, n=190).

One study was rated as good quality, one as fair and one as fair to poor.

There was insufficient evidence to determine the diagnostic performance of ERCP in comparison with other modalities.

Abdominal pain of possible pancreaticobiliary origin (3 studies, n=136).

One study was rated as good quality and two as fair.

The results varied considerably between these 3 studies. There was insufficient evidence to determine the diagnostic performance of ERCP in comparison with biliary scintigraphy.

**Authors' conclusions**

MRCP, EUS and ERCP had similar diagnostic performance for detecting common bile duct stones and malignant pancreaticobiliary obstruction. However, rigorous studies are required to quantify the relative performance of ERCP in
comparison with alternative diagnostic techniques.

CRD commentary
The review question was clear with well-defined inclusion criteria. Several relevant sources were searched; however, both publication and language bias may be an issue because of the restriction to English language, peer-reviewed articles. The selection of studies, primarily by a single reviewer, may have led to selection bias and missed studies. The data extraction was conducted in duplicate, but it was unclear whether the same method was used to reduce error and bias during the quality assessment. The decision to combine the studies in a narrative was appropriate, and the results were presented clearly. Given the evidence available, the authors' conservative conclusions seem appropriate.

Implications of the review for practice and research
Practice: The authors stated that the costs and risks of the tests, and the resulting action based on their results, along with pre-test probabilities, need to be considered when determining the optimal diagnostic strategy.

Research: The authors stated that technologies that have a good performance should be agreed upon and used as common reference standards, studies should be rigorously designed and adequately powered, and short-term morbidity should be assessed.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract
contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.