Suspected choledocholithiasis: endoscopic ultrasound or magnetic resonance cholangiopancreatography? A systematic review

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CRD summary
This review concluded that the diagnostic performance of endoscopic ultrasound and magnetic resonance cholangiopancreatography were equivalent and that other factors, such as patient preference and relative invasiveness, should be considered when testing strategies were decided. The authors’ interpretation of the data seemed reasonable, but may not represent the entire evidence base and were derived from studies of unknown quality.

Authors' objectives
To compare the diagnostic performance of endoscopic ultrasound and magnetic resonance cholangiopancreatography (MRCP) in patients with suspected common bile duct stones (choledocholithiasis).

Searching
MEDLINE and Cochrane Controlled Trials Register were searched for English-language studies. Search terms, but not dates, were reported. Abstract books and the bibliographies of review articles and included studies were searched for additional articles.

Study selection
Blinded randomised studies in which endoscopic ultrasound, MRCP and a reference standard (endoscopic retrograde cholangiopancreatography (ERCP), intraoperative cholangiography or reasonable clinical follow up) were performed in the same patients to rule out choledocholithiasis were eligible for inclusion. Meta-analyses were also eligible for inclusion, but none were identified. The mean age of participants in included studies ranged from 46.5 to 64 years. The proportion of participants with a diagnosis of choledocholithiasis ranged from 18% to 86%.

The authors stated neither how studies were selected for the review nor how many reviewers were involved in the selection process.

Assessment of study quality
The authors did not state that they assessed study validity.

Data extraction
Data needed to calculate sensitivity, specificity and accuracy were extracted. Odds ratios (OR) and 95% confidence intervals (CIs) were calculated for the comparison of accuracy between endoscopic ultrasound and MRCP. For studies that included participants with diagnoses other than biliary stones, analysis was limited to biliary stones; participants with other diagnoses were treated as negative cases.

The authors stated neither how data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
A random-effects model was used to generate pooled estimates of sensitivity, specificity and accuracy. A fixed-effects model was used to calculate aggregate odds ratios. The method used to detect between study heterogeneity was not specified, but appeared to be $X^2$ and $I^2$ tests.

Results of the review
Seven studies met the inclusion criteria (n=405). The authors stated that a test for between-study heterogeneity was not significant.
Endoscopic ultrasound: Sensitivity ranged from 80% to 100%, specificity ranged from 50% to 99% and accuracy ranged from 93% to 96%.

MRCP: Sensitivity ranged from 40% to 100%, specificity ranged from 72% to 97% and accuracy ranged from 82% to 94%.

The diagnostic performance of MRCP was generally slightly inferior to that of endoscopic ultrasound. Odds ratios were 0.34 (95% CI 0.17 to 0.70) for sensitivity, 0.78 (95% CI 0.35 to 1.73) for specificity and 0.79 (95% CI 0.47 to 1.32) for accuracy.

Cost information
A cost-effectiveness analysis reported in one of the included studies favoured endoscopic ultrasound for initial imaging of patients with extrahepatic disease.

Authors’ conclusions
There was no statistically significant difference in sensitivity, specificity or accuracy between endoscopic ultrasound and MRCP. Hence, either can be used to screen for choledocholithiasis.

CRD commentary
The review addressed a clearly stated research question defined by appropriate inclusion criteria. The literature search was of limited scope and restricted to English-language articles; relevant data may, therefore, have been omitted from the review. Reporting of the review process was poor and no assessment of the methodological quality of the included studies was reported. There were insufficient study details for the reader to make a judgment as to the quality of the included evidence. It was, therefore, not possible to assess the potential impact upon review findings of error or bias in either the review itself or in the included primary studies. The analysis presented was reasonable in the absence of evidence of clinical or statistical heterogeneity. The authors' interpretation of the data presented was reasonable, but these data may not represent the entire evidence base and were derived from studies of unknown quality.

Implications of the review for practice and research
Practice: In the absence of statistically significant differences in diagnostic performance between the endoscopic ultrasound and MRCP, other factors (such as relative invasiveness, cost, availability, local expertise and patient preference) should be taken into consideration when deciding testing strategy.

Research: Cost-effectiveness studies were needed to assess all relevant factors.

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