Performance of transient elastography for the staging of liver fibrosis in patients with chronic hepatitis B: a meta-analysis
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CRD summary
This review concluded that transient elastography imaging could be performed with good diagnostic accuracy for quantifying liver fibrosis in patients with chronic hepatitis B. Given the lack of reporting of review methods, the limitations of the statistical analysis, and the lack of clarity about the biases of the included studies, the authors' conclusions are overly strong.

Authors' objectives
To assess the performance of transient elastography for diagnosing liver fibrosis in patients with chronic hepatitis B.

Searching
PubMed, EMBASE and The Cochrane Library were searched from 2002 up to March 2011 for studies in English; search terms were reported. Digestive Disease Week, Google Scholar, web sites and conference abstracts of three appropriate associations were also searched.

Study selection
Studies that assessed the accuracy of transient elastography for diagnosing liver fibrosis in patients with chronic hepatitis B, using liver biopsy as the reference standard, were eligible for inclusion. Studies had to use a fibrosis staging system comparable to the METAVIR algorithm (scoring system) and report estimates of diagnostic accuracy based on certain transient elastography cut-offs (not specified).

In included studies, the mean age of patients ranged from 35.6 to 57.8 years; approximately 58% to 80% of patients were men (where reported). The mean body mass index of included patients ranged from 22 to 25.6kg/m². Most studies used the METAVIR score as the fibrosis staging system. Most studies were conducted in Asian countries.

The authors did not state how many reviewers selected studies for the review.

Assessment of study quality
Study quality was assessed using the 14-point QUADAS tool.

The authors did not state how many reviewers assessed study quality.

Data extraction
Sensitivity and specificity were extracted or calculated from each study.

Two reviewers independently extracted data.

Methods of synthesis
Summary receiver operating characteristic curves (model not reported) were used to calculate the area under the curve with a standard error. Summary estimates, with 95% confidence intervals, of the area under the curve were calculated using a random-effects meta-analysis; results from different staging systems were standardised to calculate this.

Homogeneity was investigated using the estimates of sensitivity and area under the curve from each study; the specific method used was not reported.

Results were reported for the detection of significant fibrosis, severe fibrosis, and cirrhosis.

An assessment of publication bias was presented; the method was not reported.

Results of the review
Eighteen studies were included in the review (2,772 patients, range 35 to 486); all scored at least 10 out of 14 on QUADAS. The authors stated that there were no outlier studies or possible publication bias identified.

The cut-off estimated to detect significant fibrosis was 7.9 kilopascals (kPa; range 6.1 to 11.8); sensitivity was 74.3% and specificity was 78.3%. The cut-off value estimated to detect severe fibrosis was 8.8 kPa (range, 8.1 to 9.7); sensitivity was 74.0% and specificity was 63.8%.

The cut-off value estimated to detect cirrhosis was 11.7 kPa (range, 7.3 to 17.5); sensitivity was 84.6% and specificity 81.5%.

Using these cut-offs, the mean area under the curve for the diagnosis of significant fibrosis was 0.859 (95% CI 0.857 to 0.860), severe fibrosis was 0.887 (95% CI 0.886 to 0.887), and cirrhosis was 0.929 (95% CI 0.928 to 0.929).

**Authors’ conclusions**

Transient elastography could be performed with good diagnostic accuracy for quantifying liver fibrosis in patients with chronic hepatitis B.

**CRD commentary**

The review addressed a clear research question with reproducible inclusion criteria. Several relevant sources were searched for both published and unpublished studies, although only studies in English were included. Although data extraction was conducted in duplicate, it was unclear whether similar methods to reduce reviewer error and bias were used during study selection and quality assessment.

Appropriate criteria were used to assess study quality, but only a summary score was presented, so it was unclear what biases the included studies were subject to and the potential importance/impact of that bias could not be assessed. There was a lack of reporting of the details of the statistical methods. It seemed that the summary estimates of diagnostic accuracy were not produced using robust methods.

Given the limitations of the review, the authors' conclusions seem overly strong.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that the accurate evaluation of transient elastography diagnostic performance would only be possible after establishing an optimal reference standard, such as laparoscopic biopsy from a designated liver location. They also stated that further longitudinal studies were required to validate the results of the review.

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