

Physical Examination of the Liver

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0196-0644/\$-see front matter

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doi:10.1016/j.annemergmed.2005.01.014

[Ann Emerg Med. 2005;45:553-555.]

RATIONAL CLINICAL EXAMINATION REVIEW SOURCE

This is a rational clinical examination abstract, a regular feature of the *Annals'* Evidence-Based Emergency Medicine (EBEM) series. Each features an abstract of a rational clinical examination review from the *Journal of the American Medical Association* and a commentary by an emergency physician knowledgeable in the subject area.

The source for this rational clinical examination review abstract is: CD Naylor. The rational clinical examination: physical examination of the liver. *JAMA*. 1994;271:1859-1865. The *Annals'* EBEM editors assisted in the preparation of the abstract of this rational clinical examination review as well as selection of the Evidence-Based Medicine Teaching Points.

OBJECTIVE

To review and summarize the value of specific physical examination components in predicting the presence of hepatomegaly and hepatic disease in adult patients.

DATA SOURCES

A search strategy to identify relevant articles was not reported.

STUDY SELECTION

Studies were included that described the precision and accuracy of the clinical examination in the identification of a palpable liver edge and hepatomegaly in adults, in comparison to a reference standard such as scintigraphy or ultrasonography. In addition, articles describing the accuracy of auscultation of the liver were included. Two studies were specifically excluded, one because of outlying results and another because of insufficient data.

DATA EXTRACTION AND ANALYSIS

Methods of data extraction are not discussed. Reported data are generally descriptive. Agreement values are reported as raw percentages or κ statistics with 95% confidence intervals (CIs). Pooled likelihood ratios are calculated and reported using data from individual studies. The value of a palpable liver edge in

predicting liver disease or hepatomegaly is also assessed using pooled data.

MAIN RESULTS

When assessing the likelihood that a palpable liver would also be enlarged on imaging, the pooled likelihood ratio for a positive test from 3 studies ($n=1,464$) was 2.5 (95% CI 2.2 to 2.8). The negative likelihood ratio of a palpable liver for the presence of hepatomegaly was 0.45 (95% CI 0.38 to 0.52). Because half of all enlarged livers are not palpable, the measurement of a vertical liver span using palpation, percussion, or the "scratch test" is recommended by some as an additional measure to identify hepatomegaly (Table). These 3 techniques for assessing liver span were compared with a criterion standard of either scintigraphy or ultrasonography in 4 studies. The percentage of patients with liver spans measured by physical examination within 2 cm of the imaging study ranged from 38% to 78%.¹⁻⁴

CONCLUSIONS

The contribution of liver examination findings to the overall diagnostic and management process is unclear; therefore, a selective approach to physical examination of the liver is suggested. In patients without reasons for suspicion of liver disease and with a nonpalpable liver, one can defer further examination of the liver. Furthermore, auscultation of the liver in general is of limited value. A liver span of less than 13 cm reduces the probability of hepatomegaly, and assessment of the quality of the liver edge is recommended only in those with signs of liver disease.

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COMMENTARY: CLINICAL IMPLICATION

Physical examination of the liver has long been considered a routine part of the abdominal examination. As with any physical finding or diagnostic test result, whether abnormal or not, it is important to weigh its value in affecting medical decisionmaking. This rational clinical examination installment

Table. Description of physical examination techniques used to define liver edge and span.

Examination Maneuver	Description
Palpation	Start palpating in the right lower quadrant at the midclavicular line as the patient inhales and continue cephalad until the liver edge is palpated.
Percussion	Percuss starting at the third rib space in the midclavicular line and continue caudally until dullness is noted.
“Scratch test”	Place stethoscope above the costal margin in the midclavicular line. Starting in the right lower quadrant, move finger cephalad while scratching the abdomen. The point where sound enhancement is heard defines the lower liver edge.

provides a review of the literature on the physical examination of the liver with conclusions that are tempered by the level of evidence available. Although there are numerous studies investigating the usefulness and reliability of examining the liver, many suffer from significant design flaws such as selection bias or small sample size, and poor interobserver agreement scores are common.³⁻⁷ However, the finding of a palpable liver edge more than doubled the likelihood that hepatomegaly was present, and the absence of a palpable liver made hepatomegaly less than one half as likely, suggesting that this simple maneuver may be helpful during abdominal examination. Given that the range of probabilities for the presence of hepatomegaly at baseline would be expected to be low, posttest probabilities for hepatomegaly can be calculated. For example, in most emergency department patients with a low pretest probability of hepatomegaly (<2%), the finding of a palpable liver edge would only increase the probability of hepatomegaly to 7.5%; however, its absence would reduce the probability of hepatomegaly to less than 1%. Conversely, in a patient with a slightly distended abdomen and a history of alcoholism, the pretest probability of hepatomegaly may be moderately high (20%). The finding of a palpable liver edge would increase the probability of hepatomegaly to 45%, and its absence would only move the probability of hepatomegaly to 10%.

The author notes that distinguishing between rare findings such as hepatic venous or arterial hums, murmurs, or bruits has never been studied and is likely to add little in formulating a final diagnosis. Studies examining the validity and reliability of more common maneuvers such as palpation, percussion, and the scratch test have been inconclusive. Augmented by a thorough history and appropriate diagnostic testing when indicated, however, palpation of the liver may play an important role in the management and evaluation of patients with potential hepatic pathology.

One cautionary note: this is one of the very first rational clinical examinations, and the statistical methods, search strategies, and data extraction methods were incompletely described. Approximately one year later, the series editors began to consistently add these into the rational clinical examination

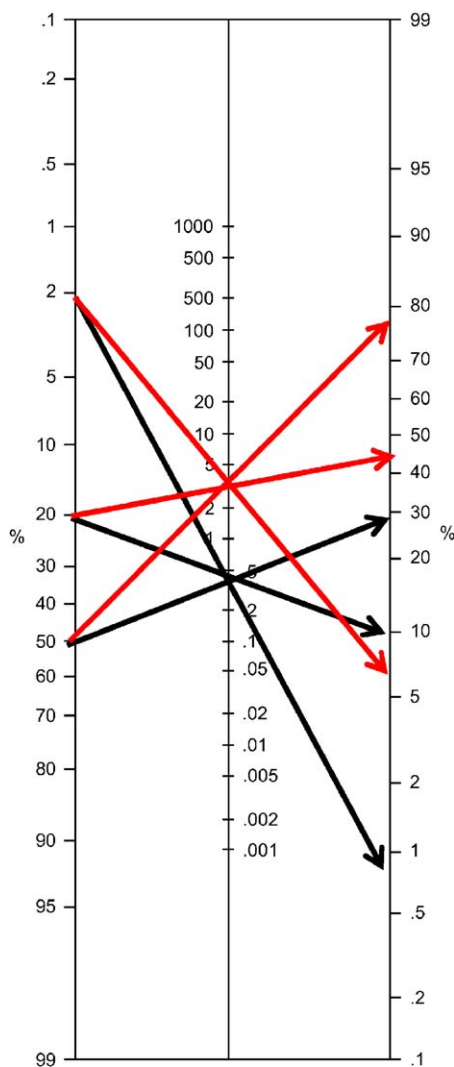


Figure. The utility of the test results on formulating a posttest probability where the pretest probability of hepatomegaly is 50% (high pretest probability), 20% (moderate pretest probability), or 2% (low pretest probability). All red lines represent the application of the positive likelihood ratio to the pretest odds, changing posttest probabilities to 80%, 45%, and 7.5%, respectively. Using the same approach, application of the negative likelihood ratio to the pretest probabilities (black lines) changes posttest probabilities to 30%, 10%, and less than 1%, respectively.

reviews. Despite the face validity of the rational clinical examination series, without the methodologic data, we cannot be entirely confident of the search, selection, and data extraction used, and this may be untenable for some readers.

TAKE HOME MESSAGE

When pretest probability is higher than normal, a palpable liver may be a useful tool in determining the need for further testing or consideration of liver disease. When pretest probability is normal, absence of a palpable liver may contribute

to the emergency physician's decision to forego further imaging. For the emergency physician, percussion, the "scratch test," liver edge quality assessment, and auscultation appear to be of limited value.

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EBEM TEACHING POINT

Applying likelihood ratios. To determine the utility of a clinical test, physicians need to understand pretest probabilities and obtain the test's positive and negative likelihood ratios. In this rational clinical examination review, the author reports that a palpable liver has a positive likelihood ratio of 2.5 for hepatomegaly and a negative likelihood ratio of 0.45. These values can be used to adjust the estimation of the pretest probability to form a posttest probability using the Phagan nomogram (Figure). In general, diagnostic tests with a likelihood ratio greater than 10 or less than 0.1 are thought to yield substantial changes in the probability of disease and are therefore considered potentially diagnostic. Tests that demonstrate a likelihood ratio greater than 2 or less than 0.5 will make

only a modest change in the probability of disease; however, such tests may be considered a potentially important contribution in certain situations. This can be graphically understood by plotting the likelihood ratio on the Phagan nomogram and applying the result to your pretest probability to formulate your posttest probability. An example is provided in the Figure.

Publication dates: Available online March 12, 2005.

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