Does this patient have abdominal aortic aneurysm?

Lederle F A, Simel D L

Authors' objectives
To determine the accuracy of abdominal palpation in identifying abdominal aortic aneurysms (AAAs).

Searching
MEDLINE was searched from 1966 to August 1998; the MeSH terms were listed. In addition, the reference lists of retrieved articles and articles in the authors' own files were checked. Unpublished information was obtained from the authors of some studies.

Study selection
Study designs of evaluations included in the review
Only studies with at least 10 patients were eligible for inclusion in the review.

Specific interventions included in the review
Studies of abdominal palpation were included.

Reference standard test against which the new test was compared
No inclusion criteria relating to the reference standard technique were specified. The studies included in the meta-analysis used ultrasound to confirm AAA. The authors stated that AAA was defined as an abdominal aortic diameter of 3 cm or greater. Data for additional cut-off points were reported in the review.

Participants included in the review
No inclusion criteria relating to the study participants were specified. The patients were aged from 17 to 90 years and were mainly male. Some had ruptured AAA and some were asymptomatic. The participants in studies included in the meta-analysis were patients at increased risk of AAA, but not previously suspected of having AAA.

Outcomes assessed in the review
No inclusion criteria relating to the outcome measure were specified. The outcome measures in the review were the sensitivity, positive predictive value, positive likelihood ratio (LR) and negative LR (at different cut-off points). It is implied that the reviewers calculated these measures.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The studies were assigned a level of evidence based on independence, blinding, sample size, whether the patients were consecutive, non-consecutive or convenient (and obviously had AAA), and the validity of the 'gold' standard. The authors did not state how the papers were assessed for validity, or how many reviewers performed the validity assessment.

Data extraction
The authors did not state how many reviewers extracted the data or how any disagreements were resolved. Data were extracted on patient selection, the patients' age and gender, the number of patients, and the number of confirmed AAA.

Methods of synthesis
How were the studies combined?
To avoid division by zero, the true-positive, false-positive, true-negative and false-negative values were increased by 0.5 when computing the LRs. The confidence intervals (CIs) for LRs from individual studies were computed using the method of Simel et al. (see Other Publications of Related Interest no.1). Data were pooled using a random-effects measure, and CIs for the pooled LRs were calculated according to Eddy and Hasselblad (see Other Publications of Related Interest no.2).

How were differences between studies investigated?
For studies included in the meta-analysis, the heterogeneity of sensitivity data and effectiveness scores (a measure of the effect size of a diagnostic test result) were assessed using chi-squared tests.

**Results of the review**

Nine studies (n=551) were included in the evaluation of sensitivity of abdominal palpation for ruptured AAA. Fifteen studies (n=2,955) were included in the assessment of abdominal palpation for asymptomatic AAA.

The chi-squared tests for heterogeneity of the sensitivity data were not significant (all P-values >0.10). Heterogeneity of the effectiveness scores was of borderline significance (pooled effectiveness 1.7, P=0.04, for cut-off of 3.0 cm; pooled effectiveness 2.1, P=0.06, for cut-off of 4.0 cm).

Level 4 (poor) evidence on abdominal palpation for ruptured AAA was inconclusive: the measures of sensitivity ranged from 51 to 100%.

When results from studies on asymptomatic patients were pooled (Level 1 evidence), the sensitivity of abdominal palpation increased significantly with AAA diameter (P<0.001). The sensitivity ranged from 29% for AAAs of 3.0 to 3.9 cm, to 50% for AAAs of 4.0 to 4.9 cm and 76% for AAAs of at least 5.0 cm. The positive and negative LRs were 12.0 (95% CI: 7.4, 19.5) and 0.72 (95% CI: 0.65, 0.81), respectively, for AAAs of at least 3.0 cm, and 15.6 (95% CI: 8.6, 28.5) and 0.51 (95% CI: 0.38, 0.67) for AAAs of at least 4.0 cm. The positive predictive value of palpation for AAAs of 3.0 cm or greater in these studies was 43%.

The limited data suggested that abdominal obesity decreased the sensitivity of palpation.

**Authors’ conclusions**

Abdominal palpation specifically directed at measuring aortic width has moderate sensitivity for detecting an AAA that would be large enough to be referred for surgery, but it cannot be relied on to exclude AAA, especially if rupture is a possibility. The sensitivity of palpation appears to be reduced by abdominal obesity and by routine abdominal examination not specifically directed at measuring aortic width. When a ruptured AAA is suspected, imaging studies such as ultrasonography or computed tomography should be performed, regardless of physical findings.

**CRD commentary**

The research question was unclear and the inclusion criteria were poorly defined, particularly in respect of the reference standard. Only one database was searched which could have led to studies being missed. The inclusion of unpublished data was reported, but it was unclear whether these were sought in a systematic way. There were no language restrictions. The review methodology was poorly reported and the details of the included studies were incomplete. The assessment of primary study quality was limited: the studies were assigned levels of evidence according to some validity criteria. It is therefore difficult to assess either the general applicability of the results of the review, or the extent to which flaws in the primary studies or review methodology may have biased its findings. Where the data were pooled, the methods used were broadly appropriate. Some further investigation of potential sources of heterogeneity may have been useful. The reporting of sensitivity values without their corresponding specificities severely limits their utility. The authors’ conclusions seem to follow from the results.

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

Practice: The authors stated that when a ruptured AAA is suspected, imaging studies such as ultrasonography or
computed tomography should be performed, regardless of physical findings.

Research: The authors did not state any implications for further research.

Bibliographic details
Lederle F A, Simel D L. Does this patient have abdominal aortic aneurysm? JAMA 1999; 281(1): 77-82

PubMedID
9892455

Original Paper URL
http://jama.ama-assn.org/

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Aneurysm, Ruptured /diagnosis; Aortic Aneurysm, Abdominal /diagnosis /ultrasonography; Humans; Palpation; Physical Examination; Sensitivity and Specificity

AccessionNumber
11999008387

Date bibliographic record published
30/04/2004

Date abstract record published
30/04/2004

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.