CRD summary
This review assessed the diagnostic accuracy of clinical tests and history taking for shoulder instability and labral tears. The authors concluded that relocation and anterior release tests provide the best evidence to diagnose shoulder instability, but there is insufficient evidence to draw conclusions about tests for labral tears. The conclusions are based on single studies and should therefore be viewed cautiously.

Authors' objectives
To assess the accuracy of clinical tests and history taking in diagnosing shoulder instability and intra-articular pathology (IAP).

Searching
MEDLINE (from 1966 to 2003), EMBASE (from 1980 to 2001) and CINAHL (from 1982 to 2001) were searched for studies published in English, Dutch or German; the search terms were reported. The reference lists of primary studies and reviews were checked.

Study selection
Diagnostic accuracy studies were eligible for inclusion. Both retrospective and prospective studies were included.

Specific interventions included in the review
Studies that described clinical tests for instability or IAP of the shoulder were eligible for inclusion. All of the included studies were conducted in orthopaedic clinics. The included studies evaluated a varying number of clinical tests, such as the apprehension test, relocation test, active compression test, anterior slide test, test of speed, and examination under anaesthesia for instability. Studies evaluating tests for labral tears included biceps load I and II, the pain provocation test of Mimori and the internal rotation resistance strength test. Further details were given in the report.

Reference standard test against which the new test was compared
Studies had to compare clinical tests or history taking with surgical or arthroscopic findings to be included in the review. Studies that used noninvasive imaging tests as the reference standard were excluded.

Participants included in the review
Studies of patients with suspected labral tears, shoulder instability or IAP were included in the review. Studies of patients with fibromyalgia, systemic disorders or fractures, tumours or strokes were excluded.

Outcomes assessed in the review
Studies that presented sensitivity and specificity were eligible for inclusion.

How were decisions on the relevance of primary studies made?
Two reviewers selected studies for inclusion.

Assessment of study quality
The studies were assessed using the Quality Assessment of Diagnostic Accuracy Studies (QUADAS) checklist. This list included criteria on patient spectrum, selection criteria, test verification, test description, uninterpretable results, blinding and withdrawals. Two reviewers assessed validity.
**Data extraction**

The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data were extracted on the sensitivity and specificity and, where possible, were used to derive positive and negative likelihood ratios (LR+ and LR-, respectively) for each study.

**Methods of synthesis**

**How were the studies combined?**

The studies were tabulated and combined in a narrative, grouped by type of shoulder problem (instability or tears) and clinical test.

**How were differences between studies investigated?**

Differences between the studies were discussed with reference to study quality criteria.

**Results of the review**

Seventeen studies (n=1,901) were included: 16 prospective studies (n=1,835) and one retrospective study (n=66).

The studies had several methodological limitations: unclear methods for selecting patients for surgery or arthroscopy; spectrum bias (highly selected populations with severe shoulder disorders); assessment mostly by test designers; modest sample size; and time between index and reference test not stated.

No studies assessed the diagnostic accuracy of history taking.

**Shoulder instability.**

Most of the tests were evaluated in single studies. The use of the relocation test (LR+ 6.5, 95% confidence interval, CI: 3.0, 14.0 and LR- 0.18, 95% CI: 0.07, 0.45; based on 1 study with 72 shoulders) and the anterior release test (LR+ 8.3, 95% CI: 3.6, 19 and LR- 0.09, 95% CI: 0.03, 0.27; based on 1 study with 100 shoulders) were found to be most accurate for the diagnosis of shoulder instability.

**Labral tears.**

Most of the tests were evaluated in single studies. The use of biceps load I (LR+ 29.0, 95% CI: 7.3, 115.0 and LR- 0.09, 95% CI: 0.01, 0.58; based on 1 study with 74 shoulders), biceps load II (LR+ 26.0, 95% CI: 8.6, 80.0 and LR- 0.11, 95% CI: 0.04, 0.28; based on 1 study with 127 patients), the pain provocation test of Mimori (LR+ 7.2, 95% CI: 1.6, 32.0 and LR- 0.03, 95% CI: 0.00, 0.47; based on 1 study with 32 shoulders) and the internal rotation resistance strength test (LR+ 25, 95% CI: 8.1, 76.0 and LR- 0.12, 95% CI: 0.04, 0.35; based on 1 study with 110 shoulders) were found to be most accurate for the diagnosis of labral tears.

**Authors’ conclusions**

The best evidence was for relocation and anterior release test for shoulder instability. There was insufficient evidence to draw firm conclusions for labral tears.

**CRD commentary**

The review addressed a clear question in terms of the index and reference test, outcomes and study design. Several relevant databases were searched for relevant studies and attempts were made to minimise language bias. However, there was no attempt to identify unpublished studies. Two reviewers selected studies and assessed validity but it was not stated whether they undertook these tasks independently, thus the potential for bias and errors could not be assessed. Validity was assessed using appropriate criteria for diagnostic studies.

The narrative synthesis was appropriate given the differences among the studies, although the results were not discussed with reference to study quality. In general, the studies included in the review were of a poor quality and the conclusions tended to be based on single studies. The authors’ conclusion, that there was insufficient evidence for the accuracy of...
tests for labral tears, appeared appropriate. However, the limitations of the evidence on diagnosing shoulder instability did not appear to be adequately highlighted in the authors’ conclusions, although such limitations were discussed in the paper.

Implications of the review for practice and research
Practice: The authors stated that clinicians should take a careful history of the mechanisms of shoulder injury. However, the authors emphasised that there was no evidence about the role of the patient’s history in diagnosing shoulder instability or labral tears.

Research: The authors implied that comparisons of the patient’s history with shoulder complaints, physical examination, and noninvasive imaging with arthroscopy and surgery would help primary care physicians.

Bibliographic details

PubMedID
15507585

DOI
10.1001/jama.292.16.1989

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

Indexing Status
Subject indexing assigned by NLM

MeSH
Cartilage, Articular /injuries; Humans; Joint Diseases /diagnosis; Joint Instability /diagnosis; Medical History Taking; Physical Examination; Shoulder Joint /anatomy & histology /injuries /physiology

AccessionNumber
12004008723

Date bibliographic record published
30/09/2005

Date abstract record published
30/09/2005

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.