Identifying SLAP lesions: a meta-analysis of clinical tests and exercise in clinical reasoning

Walton DM, Sadi J

CRD summary
This review concluded that Yergason's test was the only clinical test to show a statistically significant positive likelihood ratio, but a positive Yergason's test only slightly increased the likelihood of a superior labral antero-posterior lesion of the shoulder being present. Despite limitations in reporting and data analysis, the authors acknowledged the weaknesses of the data and drew appropriately cautious conclusions.

Authors' objectives
To assess the diagnostic performance of clinical tests used for superior labral antero-posterior (SLAP) lesion of the shoulder.

Searching
MEDLINE, EMBASE and CINAHL were searched from inception for published English language studies. Search terms were reported.

Study selection
Clinical tests for superior labral antero-posterior lesion of the shoulder that had been evaluated prospectively, by at least three independent research groups, and compared with the reference standard of arthroscopic investigation, were included in the review. Only studies that compared tests prospectively with arthroscopy, in all participants, were eligible for inclusion. Included studies were required to report measure of diagnostic accuracy (sensitivity and specificity, or likelihood ratios), or sufficient data for their calculation. Studies that did not provide adequate descriptive statistics were excluded.

Five tests were evaluated by the review: O'Brien's Active Compression test; the Crank test; Jobe's Relocation test; Speed's test; Yergason's test.

The authors did not report how studies were assessed for inclusion, or how many reviewers performed the assessment.

Assessment of study quality
Studies were assigned a quality score based on the following four criteria: whether there was an independent blind comparison with a reference standard (the authors stated that magnetic resonance arthrography was considered an appropriate non-invasive reference standard for asymptomatic participants); whether the spectrum of patients appropriate; whether the reference standard was applied independently of the test result; whether the test was validated in a second, independent group of patients.

Validity assessment was performed by a single reviewer.

Data extraction
Positive likelihood ratio, with 95% confidence intervals (CIs), was the only outcome measure reported.

The authors did not state how data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
A random-effects model was used to generate pooled estimates of positive likelihood ratio for each included test.

Potential sources of between study heterogeneity were investigated by stratifying on the basis of pre-specified criteria: quality score; number and type of test assessor; whether the study evaluated one or more tests in the same sample; whether the study was the first to describe the diagnostic performance of a given test.
Publication bias was assessed using the fail-safe N statistic.

**Results of the review**

Seven studies (total number of participants unclear) were included in the review. All included studies applied the reference standard regardless of index test result. Five studies included an appropriate spectrum of patients. Two studies provided an independent blind comparison with the reference standard. No study validated the test in a second independent group of patients.

The pooled positive likelihood ratios were: 1.07 for O'Brien's Active Compression test (95% CI 0.83 to 1.38; n=297); 1.51 for the Crank test (95% CI 0.62 to 3.68; n=360); 1.13 for Jobe's Relocation test (95% CI: 0.89, 1.44; n=258); 1.12 for Speed's test (95% CI 0.78 to 1.61; n=353); and 2.29 for Yergason's test (95% CI 1.21 to 4.33; n=308). Only Yergason's test showed statistical significance in its ability to rule in a superior labral antero-posterior lesions of the shoulder.

There was significant heterogeneity between studies evaluating the Crank test (p<0.001), which was not eliminate when studies were stratified by any of the pre-specified variables.

The fail-safe analysis suggested that, for Yergason's test, the number of studies that would need to be included in the analysis in order to rule out a significant effect from publication bias, would be 24.

**Authors’ conclusions**

Only Yergason's test showed a statistically significant positive likelihood ratio for the diagnosis of superior labral antero-posterior lesions of the shoulder. However, the value of this positive likelihood ratio suggested that a positive test result only slightly increase the likelihood that a superior labral antero-posterior lesion was present. The studies reviewed were of generally low methodological quality, which precluded strong conclusions being drawn.

**CRD commentary**

The review addressed a clearly stated research question, which was defined by appropriate inclusion criteria. The restriction of the search to published, English language studies may have resulted in the omission of relevant data, leaving open the possibility of language and publication biases. The methodological quality of included studies was assessed and the results of this assessment incorporated into the authors’ interpretation of their results. Details of the review process were not reported, so it is not possible to assess the potential for the introduction of error and/or bias. The results of included studies were only reported as positive likelihood ratios, with no further study details provided; reporting of the corresponding negative likelihood ratios and further details of the study populations would have aided interpretation. Some assessment of between study heterogeneity was reported, but no assessment of threshold effect (the variation of diagnostic performance with threshold, or definition of a positive test result) was included; so it is not possible to assess whether the pooling of likelihood ratios across studies was an appropriate analytic approach. Given the methodological limitations of the included studies and the small size of the data set (noted by the authors), the conclusions drawn were appropriately cautious.

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

**Practice:** The authors made no recommendations for practice.

**Research:** The authors stated that future investigations should give greater consideration to methodological rigour. The four quality criteria reported by the authors provide a sound basis for this. Where an arthroscopic investigation is considered unfeasible or unethical for all participants, magnetic resonance imaging (MRI) arthrography can provide a suitable alternative reference standard, provided that all participants undergo the same, more conservative, reference standard.

**Funding**

Not stated.
Bibliographic details

PubMedID
19083717

DOI
10.1016/j.ptsp.2008.07.001

Original Paper URL
http://www.physicaltherapyinsport.com/article/S1466-853X(08)00077-1/abstract

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Decision Making; Diagnostic Tests, Routine; Humans; Joint Diseases /diagnosis; Shoulder Joint /pathology; Tendon Injuries /diagnosis

AccessionNumber
12009101182

Date bibliographic record published
31/03/2009

Date abstract record published
13/01/2010

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.