Diagnostic Accuracy of Clinical Tests for Subacromial Impingement Syndrome: A Systematic Review and Meta-Analysis

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Introduction

This study describes a systematic review and meta analysis of the diagnostic accuracy of clinical tests for subacromial impingement syndrome (SIS). The Authors define SIS and give a table of common clinical tests used to diagnose SIS including Neers, Hawkins Kennedy, horizontal abduction, empty can, full can, drop arm, painful arc tests etc. The authors explain that a recent review looked at diagnostic accuracies of clinical tests for different shoulder pathologies including SIS, however this review included studies using various reference standards in the diagnosis.

Methods

The authors report that they used PRISMA guidelines in conducting the review. A literature search was carried out using Cochrane Library, EMBASE, Science Direct, and PubMed. The authors explain that 2 reviewers screened the articles and keywords and the inclusion criteria are clearly described. Inclusion criteria were prospective or retrospective cohort studies that examined individuals with a painful shoulder, reported any clinical test for SIS, and used arthroscopy or open surgery as the reference standard. There is no mention of following up on references found, or discussion with any 'experts' in the area, or any mention of identifying any unpublished data. The search strategy yielded 1338 articles of which 1307 publications were excluded based on title/abstract. Sixteen of the remaining 31 articles were included

The number of true positives, true negatives and false negatives were extracted from each study and a 2x2 table. Authors were contacted as necessary and the QUADAS tool was used to measure the quality of the included studies.

The data synthesis and analysis is described in detail with rational for the choices of specific statistical tests given. Bivariate random effects models were used to estimate sensitivity and specificity and their corresponding 95% CIs. ROC graphs were generated. Heterogenity was evaluated visually and by the variance of logit-transformed sensitivity and specificity. Bayes theorem was used to estimate the post test probability of SIS. Prevelance was estimated using formula (true +ve + false –ve)/(true +ve + false +ve + false –ve + true –ves).

Results

A table is given summarising the characteristics of studies included. The authors describe the demographics of the participants of the studies, size of the study populations, and the

various tests included in the studies. The authors explain that the methodological quality of included studies varied from moderate to good.

A table is presented with the summary estimates of sensitivity and specificity of 5 tests – Hawkins kennedy, droparm, empty can, neers sign and lift off tests. In summary the authors explain that all the clinical tests had useful diagnostic values. A positive Hawkins-kennedy, Neers and Empty can increases the probability of SIS. Neers has the highest pooled sensitivity (.78). Lift off has highest pooled specificity (.97). Drop arm test has next highest specificity (.92)

Discussion

The authors state their main findings – that is that Hawkins kennedy, Neers amd Empty can tests have higher sensitivities than specificities. The drop arm and lift off have higher specificities. They then explain that this is the first review of its kind using surgical diagnosis as its reference standard.

The authors state the need for future prospective cohort studies in this area in the primary care setting and provide recommendations with regard to the methodologies of such studies.

The authors go on to discuss the clinical implications of the review. They discuss the current international guidelines around the diagnosis and management of SIS.

The authors describe the limitations of their study including the fact that they were unable to extract data from some older studies, also the variety of clinical tests used meant that not all tests could be included in the review. They also mention that the variability of diagnostic accuracy across tests was high.

Conclusion

The authors conclude that accurate diagnosis of SIS is difficult. They suggest that the lift off test provides strong evidence to rule in SIS and the accurate diagnosis of SIS may improve appropriate management of this patient group.

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