MR findings in humeral epicondylitis: a systematic review

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Authors' objectives
To conduct a meta-analysis on the accuracy of magnetic resonance imaging (MRI) in epicondylitis.

Searching
MEDLINE (from 1966 to December 1998), EMBASE (from 1990 to December 1998), NIOSHTIC (from 1990 to December 1998) and Current Contents (until December 1999) were searched; details of the search strategy were given. The reference lists of relevant studies were checked and specialists in the field were contacted for additional published and unpublished studies. Three topic-specific journals were handsearched (from 1990 to December 1998).

Study selection
Study designs of evaluations included in the review
Review articles and case reports were excluded.

Specific interventions included in the review
Studies of MRI used to evaluate elbow anatomy and pathology were eligible for inclusion. The field strength ranged from 0.2 to 1.5 Tesla. The slice thickness ranged from 1.5 to 4 mm. Either T1-, T2- or proton-weighted spin-echo sequences were used. The standard position of the patient was supine, with the arm extended above the patient's head or by their side; this information was not reported in all studies. The coils used included an extremity coil, 5-inch received only surface coil, shoulder coil, elbow coil and unpolarised solenoidal. Some studies performed gadolinium-enhanced imaging.

Reference standard test against which the new test was compared
No inclusion criteria relating to the reference standard were specified. The reference standard used in the included studies appears to have been a previously established clinical diagnosis.

Participants included in the review
Studies of patients being evaluated for epicondylitis were eligible for inclusion. Studies of patients with normal anatomy were excluded. The patients in the included studies were aged from 22 to 71 years. All cases were sub-acute or chronic, and symptoms had persisted for at least 1 month. The control groups were healthy volunteers and contralateral elbows of cases.

Outcomes assessed in the review
No inclusion criteria relating to the outcomes were specified. Sensitivity, specificity and accuracy were reported as the outcome measures for the review. These were presented as the proportion of patients and controls with magnetic resonance findings.

How were decisions on the relevance of primary studies made?
Two reviewers independently screened studies for inclusion, first by titles and abstracts and then by the whole text. Any disagreements were resolved through consensus.

Assessment of study quality
The studies were assessed for validity on the basis of: study type; use of a valid reference standard (proper clinical diagnosis (not defined)); blinding of assessments; comparability of controls; inter- and intra- observer agreement; appropriate selection of the patients; description of the tests; and reporting of the sensitivity and specificity. Three reviewers independently extracted data on quality items.
Data extraction
Three reviewers independently extracted the data using structured forms for clinical and demographic data, technical factors for MRI and imaging findings. The authors stated that the sensitivity, specificity and accuracy were calculated where possible. However, data on accuracy does not appear to have been reported in the results. The 95% confidence intervals (CIs) for proportions were calculated using the binomial distribution.

Methods of synthesis
How were the studies combined?
A narrative synthesis of the studies was presented.

How were differences between studies investigated?
Differences between the studies were discussed.

Results of the review
Seven studies (148 patients with epicondylitis, and 11 asymptomatic contralateral elbows and 29 elbows of healthy volunteers as controls) were included. Three studies used a diagnostic case-control design, of which two were prospective and one was retrospective. The other four studies were diagnostic cohort studies, of which two were prospective and two were retrospective.

The most frequent alteration was a change in the common extensor tendon signal (90%, 95% CI: 84, 94). Fourteen percent (95% CI: 4, 32) of the healthy volunteers and 50% (95% CI: 23, 83) of the contralateral elbows displayed similar alteration.

Thickening or thinning of the common extensor tendon was reported in 55% (95% CI: 46, 63) of the patients, compared with 3% (95% CI: 0, 18) of the health controls and 27% (95% CI: 6, 61) of the contralateral elbows. Abnormalities in the radial collateral ligament were seen in 47% (95% CI: 34, 61) of the patients in the two studies that investigated this.

Authors' conclusions
Small sample size and methodological shortcomings in the original studies make the assessment of MRI findings in epicondylitis questionable. There is a need for well-designed studies in which clinical features and occupational backgrounds, as well as imaging parameters, are carefully documented.

CRD commentary
This was a well-conducted and clearly reported review. The review objective was clearly stated and was supported by well-defined inclusion criteria. A detailed literature search was undertaken, which included attempts to locate unpublished studies. It is therefore unlikely that any important studies were missed. Full details of the review process, which included a detailed quality assessment and steps to avoid bias, were reported. Adequate details of the studies were tabulated and summarised clearly in the text of the review. The narrative synthesis was appropriate given the differences between the studies. The authors' conclusions are supported by the results presented.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that there is a need for well-designed studies in which clinical features and occupational backgrounds, as well as imaging parameters, are carefully documented.

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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.