Diagnostic criteria for atopic dermatitis: a systematic review

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CRD summary
This review summarised evidence on the validity of diagnostic criteria for atopic dermatitis (AD) and concluded that the UK criteria were the most extensively validated, although methodological quality of included studies varied substantially and improved methodological design was needed. Given the limited and diverse evidence presented, the conclusions appeared appropriate.

Authors' objectives
To summarise the evidence on the validity of diagnostic criteria for atopic dermatitis (AD)

Searching
MEDLINE, EMBASE and The Cochrane Library databases were searched up to June 2007 to identify relevant studies. In addition, the reference lists of retrieved publications were searched and articles written by designers of diagnostic criteria identified. No language restrictions were applied. Search terms were reported.

Study selection
Randomised controlled trials, case control, cross-sectional and cohort studies that evaluated on one or more of the existing diagnostic criteria for AD in a hospital or community setting were eligible for inclusion in the review. In addition, the studies had to report sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV), or provide sufficient data to calculate these outcomes. Studies could use any reference standard test.

Diagnostic criteria evaluated in the selected studies included: UK criteria; Hanifin and Rajka; Schulz-Larsen; Diepgen; Kang and Tian; and ISAAC. Most studies were in children aged 18 years or less. Most of the selected studies used clinical diagnosis as the reference standard.

Two reviewers independently assessed studies for inclusion.

Assessment of study quality
Two reviewers independently evaluated included studies according to the QUADAS criteria. Disagreements were resolved by discussion.

Data extraction
Two reviewers independently extracted data on the key characteristics of included studies. Disagreements were resolved by discussion. Translated criteria were verified through back translation. All calculations of outcome measures were verified by recalculation.

Methods of synthesis
Studies were combined in a narrative synthesis, summarising the range of sensitivities and specificities reported for each set of diagnostic criteria. Values were illustrated with receiver operating characteristic (ROC) plots for hospital-based and population-based studies.

Results of the review
Twenty articles reporting 27 validation (n >33,938) studies were included in the review. Nine articles were hospital-based, 12 were population-based and one was both.

All but one of the studies stated that the same reference standard was used regardless of the index test result. Seventeen studies described the reference standard in sufficient detail to permit its replication; three reported uninterpretable and intermediate test results.

The following diagnostic accuracy ranges were reported for the evaluated criteria:
Hanifin and Rajka (two studies): sensitivity 87.9 per cent to 96 per cent, specificity 77.6 per cent to 93.8 per cent based on clinical diagnosis as the reference standard.

UK diagnostic criteria (19 studies): sensitivity 10 per cent to 100 per cent, specificity 89.3 per cent to 99.1 per cent based on reference standards of clinical diagnosis, Hanifin and Rajka, UK, and Japanese Dermatology Association Criteria.

Schultz-Larsen (two studies): sensitivity 88 per cent to 94.4 per cent, specificity 77.6 per cent to 95.9 per cent based on clinical diagnosis and Hanifin and Rajka as the reference standard.

Diepgen (one study using three lists described by Diepgen): sensitivity 83 per cent to 87.7 per cent, specificity 83.9 per cent to 87 per cent based on clinical diagnosis as the reference standard.

Kang and Tian (one study): sensitivity 95.5 per cent, specificity 100 per cent based on Hanifin and Rajka as the reference standard.

ISAAC (one study): positive predictive value 48.8 per cent, negative predictive value 91.1 per cent based on clinical diagnosis as the reference standard.

**Authors’ conclusions**
The UK AD diagnostic criteria were the most extensively validated, although methodological quality of included studies varied substantially. Improved methodological design and uniformity in well-validated and applicable diagnostic criteria were required to improve future intervention studies.

**CRD commentary**
The review question was broadly defined in terms of the diagnostic test, study designs and outcomes of interest. Any tests were acceptable as the reference standard. The search for relevant literature covered several electronic and supplementary sources. The search appeared to be limited to published studies, so some relevant studies may have been missed, potentially introducing publication bias. Study quality was assessed according to established criteria. Details of the assessment were presented alongside the findings of the included studies. Attempts were made to minimise the potential for errors and bias throughout the various review processes. Given the heterogeneity of the included studies the presentation of results in tables and ROC plots (as opposed to statistical meta-analysis) was appropriate. The authors might have grouped studies by reference standard in an attempt to remove one source of heterogeneity, but this was not done. No information other than age was provided about participants, so it was not possible to assess the extent to which participants represented people with atopic dermatitis. Given the evidence presented, the authors’ conclusions appeared broadly appropriate.

**Implications of the review for practice and research**
Research: The authors stated that future validation studies should follow a clear methodological guideline such as QUADAS and should use standardised nomenclature and up-to-date well-validated diagnostic criteria.

Practice: The authors stated that the UK diagnostic criteria should be recommended for future intervention studies.

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