Is galectin-3 a good method for the detection of malignancy in patients with thyroid nodules and a cytologic diagnosis of "follicular neoplasm"? A critical appraisal of the evidence

CRD summary
This review found that galectin-3 had the potential to guide therapy decisions in patients with thyroid nodules, but that the quality of the available data was too poor to allow definitive conclusions. Limitations in the literature search, failure to assess study quality and lack of synthesis mean that the results of this review should be interpreted with caution.

Authors' objectives
To determine the accuracy of galectin-3 as a molecular marker to define treatment approach in patients with thyroid nodules and a diagnosis of follicular pattern.

Searching
MEDLINE and EMBASE were searched from 1980 to September 2006. Search terms were reported. References were screened to identify additional studies. The review was restricted to studies published in English.

Study selection
Prospective diagnostic cohort studies that compared galectin-3 alone or with other molecular markers in the immunostaining of cytological specimens obtained via fine needle aspiration biopsy (FNAB) in which histopathology served as the gold standard were eligible for inclusion. Patients had to have thyroid nodules, a report of follicular neoplasm and have final histopathology reports available.

Samples were obtained by fine needle aspiration biopsy (ultrasound guided in some studies). Testing methods included cell isolation by immunomagnetic isolation technique and galectin-3 detection with immunoblotting; avidin-biotin complex and two smears was used for galectin 3 immunohistochemistry. Positivity for galectin 3 was considered when more than 10%, 20% or 50% of cells were stained.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Data were extracted as 2x2 tables of test performance. Estimates of sensitivity, specificity and positive and negative likelihood ratios were calculated for each study. The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Results were summarised in tables. Meta-analysis was not undertaken.

Results of the review
Six studies (665 included patients; 2x2 data available for 426). Sensitivity and specificity both ranged from 75% to 100%. Positive likelihood ratios ranged from 3.5 to 18.1. Negative likelihood ratios ranged from 0.03 to 0.29.

Authors' conclusions
Galectin-3 had the potential to guide therapy decisions in patients with thyroid nodules. However, the available data had methodological flaws and so it was not possible to draw definitive conclusions.

CRD commentary
The review addressed a defined question. Inclusion criteria were defined, but were somewhat difficult to interpret. The literature search was adequate for published studies, but restriction of the review to published English-language studies meant that the review may have been subject to language and publication biases. The authors did not report sufficient details of the review process to determine whether adequate steps were taken to minimise bias and errors. A formal quality assessment was not carried out, although some methodological features formed the basis of the inclusion criteria and the discussion addressed methodological features of the included studies. Methods of analysis were limited to reporting estimates of diagnostic accuracy in a table. A more informative analysis would have assessed and investigated heterogeneity and would have included a formal meta-analysis. Presenting of results on an SROC (summary receiver operating characteristic) plot would have helped interpretation and assessment of heterogeneity. Limitations in the literature search, failure to formally assess study quality and lack of any form of synthesis meant that the results of this review should be interpreted with caution.

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

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