Accuracy of sentinel node biopsy after neoadjuvant chemotherapy in breast cancer patients: a systematic review

van Deurzen CH, Vriens BE, Tjan-Heijnen VC, van der Wall E, Albrechts M, van Hilligersberg R, Monninkhof EM, van Diest PJ

CRD summary
This review concluded that there was a potential role for sentinel node biopsy following neoadjuvant chemotherapy in breast cancer patients, but that there was insufficient evidence to recommend this as a standard procedure. These conclusions are supported by the data, but should be interpreted with caution given the possibility of missed studies and lack of a formal quality assessment.

Authors' objectives
To determine the accuracy of sentinel node biopsy following neoadjuvant chemotherapy in nodal staging patients with breast cancer.

Searching
MEDLINE, EMBASE and the Cochrane Library were searched from 1993 to February 2009. Search terms were reported. The review was restricted to studies published in English, German, French or Dutch.

Study selection
Studies that evaluated sentinel node biopsy after neoadjuvant chemotherapy, in patients who had undergone neoadjuvant chemotherapy for invasive breast carcinoma, compared with the reference standard of axillary lymph node dissection, were eligible for inclusion. Studies of patients receiving neoadjuvant endocrine therapy only were excluded.

Included patients had large primary breast tumours; the clinical tumour diameter ranged from 0 to 4cm and the clinical nodal status was either no involvement, CN1 or CN2. The upper outer quadrant of the breast was the most common primary tumour location. Sentinel nodes were usually identified using a combination of radiocolloid and blue dye injected peritumourally. The most frequently used chemotherapy was a combination of anthracycline and cyclophosphamide.

Two reviewers independently assessed studies for inclusion.

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

Data extraction
Two reviewers independently extracted data as true negative, false negative and true positive results. Any results positive on sentinel node biopsy was considered to be a true positive, so it was assumed that there were no false positive results. These data were used to calculate sensitivity, false negative rates (1 - sensitivity), and negative predictive values together with 95% confidence intervals (CI). Disagreements were resolved through consensus.

Methods of synthesis
Summary accuracy parameters together with 95% confidence intervals were estimated using a random-effects model with an exact likelihood approach. Heterogeneity was assessed visually using graphical presentation of results. Meta-regression was used to investigate heterogeneity. Publication bias was assessed using funnel plots.

Results of the review
Twenty-seven studies (n=2,148 patients) were included.

The overall pooled sentinel node identification rate was 90.9% (95% CI 88 to 93). Summary sensitivity was 89% (95% CI 85 to 92). Forest plots suggested substantial between study heterogeneity. Meta-regression suggested that clinical nodal status at initial diagnosis did not contribute to between study heterogeneity. There was insufficient data to assess
the effects of clinical tumour size. Funnel plots did not suggest evidence of publication bias.

Authors' conclusions
There was potential role for sentinel node biopsy following neoadjuvant chemotherapy which could be considered on an individual basis. However, there was insufficient evidence to recommend this as a standard procedure.

CRD commentary
The review addressed a focused question supported by clearly defined inclusion criteria. The literature search was adequate for published studies, but restriction of the review to studies published in certain languages raised the possibility of language and publication bias. This was assessed in the review, but methods used were not appropriate for diagnostic accuracy studies. Appropriate steps were taken to minimise bias and errors at all stages of the review process.

Study quality was not formally assessed, so the reliability of the included studies was unclear. Details on individual studies were also lacking. Methods used to pool studies appeared appropriate and results were clearly presented using graphical displays.

The authors' conclusions are supported by the data, but should be interpreted with caution given the possibility of missed studies and lack of a formal quality assessment.

Implications of the review for practice and research
Practice: The authors stated the performing an sentinel node biopsy following neoadjuvant chemotherapy could be considered on an individual basis but that there was insufficient evidence to recommend this as a standard procedure.

Research: The authors stated that further research, with subgroup analysis using variables reported to be associated with decreased sentinel node accuracy, is required in order to clearly define its value in the subgroups of breast cancer patients. The authors also stated that there is a need for a clinical trial, with long-term follow-up, to evaluate the safety of omission of an axillary lymph node dissection in patients with a negative sentinel node after neoadjuvant chemotherapy.

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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.