Cost-effectiveness of stereotactic core needle biopsy: analysis by means of mammographic findings

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Stereotactic core needle biopsy (SCNB) of nonpalpable breast lesions which are indeterminate and appear suspicious on mammograms.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Women with nonpalpable breast lesions detected with mammography and undergoing stereotactic core needle biopsy (SCNB). Reasons against this indication were as follows: a location rendering the lesion technically inaccessible; small enough breast size so as not to allow accommodation of the throw of the biopsy needle; a very poorly defined lesion for which accurate targeting might be difficult. Also, scars believed likely to represent radial scars on mammographic appearance, were treated with open surgical biopsy and, therefore, were not eligible for SCNB.

Setting
Hospital. The study was carried out in New Haven, Connecticut, USA.

Dates to which data relate
The effectiveness and resource use data were collected between 1992 and 1995. The price year was 1995.

Source of effectiveness data
The estimate of the number of OSB procedures avoided by the SCNB was derived from a single study.

Link between effectiveness and cost data
The costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
A total of 356 women, for whom data on 405 (out of 406) nonpalpable lesions were available, were included in the study. No power calculations were reported.

Study design
Case series in a single centre. The duration of follow-up was up to 48 months (6, 12, 24 and 36 months) after the first diagnostic test. There was no loss to follow-up.

**Analysis of effectiveness**
The analysis was based on the whole sample. The primary health outcome was the number of OSB procedures avoided by the SCNB.

**Effectiveness results**
OSB was averted by the use of SCNB in 81% (328/405 lesions). Of the 254 masses and 151 calcifications, 87% and 72%, respectively, were spared OSB (95% CI: 0.64 - 0.78).

**Clinical conclusions**
The number of OSB procedures avoided by the SCNB varies with the appearance of the targeted lesion.

**Measure of benefits used in the economic analysis**
The measure of benefits used in the economic analysis was the number of OSB procedures avoided.

**Direct costs**
The costs associated with mammographic follow-up OSB and SCNB were included in the analysis. Costs were not discounted. The quantities of resource use were reported separately from the costs. The analysis included operating and capital costs. The unit costs were based on Medicare data for 1995. The price year was 1995.

**Currency**
US dollars ($).

**Sensitivity analysis**
In the form of a break-even analysis, the variations in efficacy rate were investigated (from the 95% CI of the estimate of proportion of patients for whom OSB was prevented SCNB).

**Estimated benefits used in the economic analysis**
OSB was averted by the use of SCNB in 81% (328/405 lesions). Of the 254 masses and 151 calcifications, 87% and 72%, respectively, were spared OSB (95% CI: 0.64 - 0.78).

**Cost results**
For the 405 cases, the use of SCNB resulted in an overall cost reduction of 58%: 63% when SCNB was used for masses and 49% when SCNB was used for calcifications.

**Synthesis of costs and benefits**
The cost savings per case were $741 for all cases, the corresponding figure for the masses and the calcifications were $804 and $630, respectively. Since the cost (at 1995 prices and without discounting being applied) ratio of SCNB to OSB was 0.20 with and 0.29 without mammographic follow-up costs included in the SCNB cost, respectively, the SCNB strategy was dominant for all categories of lesions according to mammographic findings, size and suspicion. The sensitivity analysis indicated that the range of break-even point estimates was from 0.91 to 0.55, for indeterminate masses and highly suspicious calcifications, respectively.
Authors' conclusions
Cost savings of SCNB varied with mammographic appearance and level of suspicion of the targeted lesion but not with size. A cost savings was realized for SCNB over OSB in all categories of lesions. While relative cost savings from SCNB will vary according to the type of lesion, performing SCNB in all cases for which it is technically feasible will result in greatest overall savings in the cost of biopsy of nonpalpable abnormalities that are indeterminate or suspicious at mammography.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear. Because SCNB is less expensive than OSB, its use in place of OSB can reduce the costs. You, as a user of this database, should consider whether these are widely used health technologies in your setting.

Validity of estimate of measure of benefit
The estimate of measure of benefit used in the economic analysis is likely to be internally valid. The data have not been used selectively.

Validity of estimate of costs
Resource quantities were reported separately from the prices. The cost analysis did not include indirect costs and costs associated with preoperative testing, time lost from work or treatment of procedural complications, which could significantly affect the economic results.

Other issues
The conclusions reached by the authors were justified given the uncertainty in the data included in the analysis. The generalisability of the study to other settings or countries was not addressed. However, appropriate comparisons were made with other studies, particularly in relation to the costs and clinical results for different mammographic appearance of targeted lesions. The authors presented their results in terms of a break-even analysis of costs, but only estimated effectiveness, in terms of health outcome, by the number of open surgical biopsies avoided.

Implications of the study
The study results would need to be further validated by evidence from longer-term follow-up data regarding the false negative rate (and its consequences) associated with both technologies (SCNB and OSB).

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