A prospective study of the timing and cost-effectiveness of bronchial washing during bronchoscopy for pulmonary malignant tumors
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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.

CRD summary
The study assessed the cost-effectiveness of the optimal time for performing bronchial washing before or after biopsy for the diagnosis of lung cancer during fibreoptic bronchoscopy. The timing of washings during bronchoscopy did not affect the diagnostic yield. In visible tumours, biopsy combined with brushing or washing was equally cost-effective, while in non-visible tumours, biopsy combined with washing was the preferred strategy. The authors’ conclusions should be interpreted with caution due to some limitations of the analysis.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The primary objective was to assess the clinical and economic impact of the optimal time for performing bronchial washing before or after biopsy in patients with endoscopically visible (central) tumours during fibreoptic bronchoscopy. A secondary objective was to estimate the cost-effectiveness of biopsy, washing and brushing; versus biopsy and washing; or biopsy and brushing.

Interventions
The analysis considered three strategies which were biopsy, washing and brushing; biopsy and washing; and biopsy and brushing. Washing could be performed before biopsy and brushing (Washing 1) or after biopsy and brushing (Washing 2).

Location/setting
Netherlands/secondary care.

Methods
Analytical approach:
This economic evaluation was based on data derived from a single study. The data were used to develop a simple model for the assessment of the alternative diagnostic approaches. The time horizon was the period required to reach a definitive diagnosis. The authors did not state the perspective adopted.

Effectiveness data:
The clinical data were derived from a prospective study carried out between 2001 and 2003 in a single secondary care medical centre. The sample comprised 221 patients (147 men and 74 women; mean age: 65.6 years; age range: 38 to 88 years) with a definitive cytologic or histologic diagnosis of pulmonary malignancy. Each patient underwent every diagnostic strategy. The length of follow-up was not reported. The key clinical outcome was the diagnostic yield of the strategies analysed. Visible and non-visible tumours were also analysed separately.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The summary benefit measure, which was derived directly from the clinical study, was the diagnostic yield of the strategies under examination.
Cost data:
The health service costs were bronchoscopy, cytology washing and brushing, histology biopsy, transbronchial needle aspiration, transthoracic needle aspiration, mediastinoscopy, thoracotomy, biopsy of extrapulmonary lesion (including histology), outpatient visit, day care, and hospitalisation. The resource use data were derived from the sample of patients included in the clinical study. The costs were derived from the authors’ institution and were in US dollars ($). The price year was not reported.

Analysis of uncertainty:
No sensitivity analysis was carried out.

Results
The diagnostic yield of the Washing 1 strategy (before) was 72% for visible tumours and 36% for non-visible tumours.

For the Washing 2 (after) strategy, the diagnostic yield was 74% for visible tumours and 42% for non-visible tumours.

No statistically significant differences were found between the two options either for visible or for non-visible tumours.

The comparison of the before and after strategies for both visible and non-visible tumours revealed that 176 cases were concordant (80%).

When considering all three approaches, the diagnostic yield in patients with visible tumours was 0.94 for biopsy, washing and brushing; 0.88 for biopsy and washing; and 0.88 for biopsy and brushing.

The average cost per correctly diagnosed case for each of the three approaches was $1,247, $1,223, and $1,223, respectively. Thus, bronchoscopy with biopsy and either washing or brushing were equally cost-effective and preferred to biopsy, washing and brushing.

The diagnostic yield in patients with non-visible tumours was 0.56 for biopsy, washing and brushing; 0.46 for biopsy and washing; and 0.49 for biopsy and brushing.

The average cost per correctly diagnosed case for each of the three approaches was $2,084, $2,243, and $2,178, respectively. Thus, the strategy of biopsy, washing and brushing was the most cost-effective strategy.

Authors’ conclusions
The authors concluded that the timing of washings during bronchoscopy in the diagnosis of lung cancer (before or after biopsy and brushing) did not affect the diagnostic yield. In patients with visible tumours, biopsy combined with brushing or washing was equally cost-effective, while in patients with non-visible tumours, biopsy combined with washing was the preferred strategy.

CRD commentary
Interventions:
The selection of the comparators was appropriate and reflected the diagnostic approaches available in the authors’ setting. The bronchoscopy technique and the washing approaches were clearly described.

Effectiveness/benefits:
The clinical data were derived from a diagnostic study, which included a sample of patients who were followed until a definitive diagnosis was made. The diagnostic approaches were evaluated in a single group of patients and the accuracy of the combined approaches was assessed by summing the individual accuracy rates. This clinical endpoint was also used as the summary benefit measure, which is disease specific and does not allow for cross disease comparisons.

Costs:
The authors did not explicitly report the study perspective. However, the sources of economic data and the costs imply that the perspective was that of the health service provider. The unit costs were presented, but data on resource use were
not provided. The price year was not reported and statistical analyses were not performed. The impact of using alternative costs was not tested.

Analysis and results:
The synthesis of costs and benefits was only partly reported; in particular the expected total cost was not given and the method used to calculate cost-effectiveness ratios was not explicitly stated. The issue of uncertainty was not addressed and sensitivity analyses were not carried out. In general, it seems that the authors' focus was on the clinical rather than the economic side of the study.

Concluding remarks:
The study methodology has some limitations associated with the limited reporting of cost data and the fact that the issue of uncertainty was not addressed. Thus, caution may be required when interpreting the authors’ conclusions.

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