Cost effectiveness of transbronchial needle aspiration

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
Transbronchial needle aspiration in the assessment of mediastinal and/or hilar lymphadenopathy.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Patients referred for bronchoscopy with computed tomographic evidence of significant mediastinal or hilar adenopathy.

Setting
The setting was a hospital. The economic study was carried out in Canada.

Dates to which data relate
Effectiveness, resource use and cost data were collected between February 1996 and February 1998. The price year was not reported.

Source of effectiveness data
Effectiveness data were derived from a single study.

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

Study sample
96 patients referred for bronchoscopy with computed tomographic evidence of significant mediastinal or hilar adenopathy were enrolled in the study. No power calculations or exclusion criteria were reported.

Study design
The study took the form of a retrospective case series carried out at a single centre. Forty-two patients with a negative TBNAs were followed medically. One of these patients was lost to follow-up.

Analysis of effectiveness
The primary health outcomes included diagnosis, use of other procedures, alteration of management, and complications.

**Effectiveness results**
TBNA yielded a positive diagnosis in 42 patients and a negative diagnosis in 54 patients. Of the 42 patients with a positive diagnosis, 40 had malignant cytology results and two had cells consistent with benign disease. The positive TBNA result altered further management in 22 of the 40 patients with malignant disease and one of two patients with benign disease. Positive TBNA obviated the need for 15 mediastinoscopy procedures, two thoracotomies, and several other procedures. Eight patients with negative TBNA underwent cervical mediastinoscopy. Four patients with negative TBNA underwent thoracotomy. Of the forty-one patients who were followed medically, twelve had inoperable bronchogenic carcinoma, one patient had a history of prior bronchogenic carcinoma with new mediastinal adenopathy, seven had a non-lung primary malignancy, 21 patients had benign disease and one had a thyroid mass. No complications related to TBNA were documented.

**Clinical conclusions**
TBNA is a high-yield, safe and effective procedure for the diagnosis and staging of bronchogenic carcinoma.

**Measure of benefits used in the economic analysis**
The measures of benefits included diagnosis, use of other procedures, alteration of management, and complications. Hence, the authors carried out a cost-consequences analysis.

**Direct costs**
Direct costs were not discounted due to the short time horizon of the study (less than 1 year). Quantities and costs were reported separately. Direct costs related to the costs of procedures averted by TBNA. The quantity/cost boundary adopted was that of the hospital. The estimation of costs was based on actual data. The estimation of quantities was based on the authors’ opinion. The source of cost data was not reported. The price year was not reported.

**Statistical analysis of costs**
The authors reported total costs.

**Indirect Costs**
Indirect costs were not included.

**Currency**
Canadian dollars (Can$).

**Sensitivity analysis**
No sensitivity analysis was conducted.

**Estimated benefits used in the economic analysis**
TBNA yielded a positive diagnosis in 42 patients and a negative diagnosis in 54 patients. Of the 42 patients with a positive diagnosis, 40 had malignant cytology results and two had cells consistent with benign disease. The positive TBNA result altered further management in 22 of the 40 patients with malignant disease and one of two patients with benign disease. Positive TBNA obviated the need for 15 mediastinoscopy procedures, two thoracotomies, and several other procedures. Eight patients with negative TBNA underwent cervical mediastinoscopy. Four patients with negative TBNA underwent thoracotomy. Of the forty-one patients who were followed medically, twelve had inoperable bronchogenic carcinoma, one patient had a history of prior bronchogenic carcinoma with new mediastinal adenopathy.
seven had a non-lung primary malignancy, 21 patients had benign disease and one had a thyroid mass. No complications related to TBNA were documented.

Cost results
The total cost of procedures avoided by TBNA was Can$27,335 versus Can$8,405, which was the cost of adding TBNA to the 99 bronchoscopy procedures. TBNA is therefore cost saving.

Synthesis of costs and benefits
Costs and benefits were not combined into cost-effectiveness ratios.

Authors' conclusions
TBNA is a high-yield, safe and cost-effective procedure for the diagnosis and staging of bronchogenic carcinoma. The ability to diagnose and stage patients at the time of initial bronchoscopy simplifies patient management in a cost-effective manner. This study supports sequential use of CT and TBNA in the investigation of patients with suspected lung cancer. Consideration should be given to using a histology needle when a benign process is suspected.

CRD COMMENTARY - Selection of comparators
The authors did not explicitly describe the comparator but it was the diagnostic and procedural outcomes with TBNA. This allowed the relative cost-effectiveness of TBNA to be assessed.

Validity of estimate of measure of effectiveness
The analysis was based on a case series, which was appropriate for the study question. The authors did not indicate whether the study sample was representative of the study population. The analysis of effectiveness was handled credibly.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The analysis was therefore categorised as a cost-consequences study, which is appropriate for this type of economic evaluation (of diagnostic procedures).

Validity of estimate of costs
Good features of the cost analysis were that the authors considered the costs of procedures avoided by TBNA, and quantities and costs were also reported separately. However, the price year was not reported which would make reflation exercises in other settings problematic. No sensitivity or statistical analyses on costs were reported, which makes it difficult to assess the validity of the cost estimates. The estimation of resource use was based on the authors' opinion, thus limiting the generalisability of the cost results. Finally, the source of the cost data was not stated.

Other issues
The authors did make appropriate comparisons of their findings with those from other studies, but did not address the issue of generalisability to other settings. The authors did not present their results selectively. The study considered patients with suspected lung cancer and this was reflected in the authors' conclusions. The study was limited by the fact that no explicit comparator was analysed, although the comparator used can be inferred from the analysis.

Implications of the study
The results of this study suggest that TBNA is a high-yield, safe and cost-effective procedure for the diagnosis and staging of bronchogenic carcinoma. This study supports the sequential use of CT and TBNA in the investigation of patients with suspected lung cancer. Consideration should be given to using a histology needle when a benign process is
suspected.

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