Impact of rapid on-site cytologic evaluation during transbronchial needle aspiration  
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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
The study evaluated rapid on-site cytologic evaluation (ROSE) during transbronchial needle aspiration (TBNA). This was compared with the same procedure without ROSE.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients scheduled to undergo TBNA at Stony Brook University Hospital.

Setting
The setting was tertiary care (a university hospital). The economic study was carried out in New York, USA.

Dates to which data relate
The effectiveness and resource use data were collected during a prospective study, the dates of which were not reported. Charges were based on published 2003 Medicare rates. The price year was 2003.

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

Link between effectiveness and cost data
It appears that the costing has been carried out prospectively on the same sample of patients as that used in the effectiveness analysis.

Study sample
The study sample consisted of 42 patients who had 44 bronchoscopies (32 with ROSE and 12 without ROSE) and 68 TBNAs (46 with ROSE and 22 without ROSE). The authors did not report whether the sample size was determined in the planning phase of the study to assure a certain power.

Study design
This was a diagnostic study that was carried out in a single centre.
Analysis of effectiveness
The primary health outcomes used were diagnostic yield, TBNA sensitivity and accuracy, and procedural time. A statistical comparison was performed, using the chi-squared test for categorical data and a nonpaired t-test for continuous data. The data were reported as the mean plus or minus the standard deviation.

Effectiveness results
The overall accuracy of ROSE in predicting a final TBNA diagnosis of malignancy was 91%, with a sensitivity of 88% and a specificity of 94%.

Comparing bronchoscopies performed with and without ROSE, the accuracy (86 to 98% versus 86 to 100%, respectively) and sensitivity (77 to 96% versus 82 to 100%, respectively) of TBNA were similar.

When ROSE was used, fewer samples were sent for microbiology tests (16% versus 62% of cases; p<0.001, chi-squared test) and pathology tests (mean 3.6 +/- 1.8 versus 5.7 +/- 1.9; p<0.01), and fewer chest radiographs were ordered (9% versus 56%; p<0.001, chi-squared test). However, the lengths of the procedures were similar (mean 39 +/-20 minutes versus 39 +/- 19 minutes; p=0.9).

Clinical conclusions
ROSE is accurate during TBNA. A diagnostic ROSE result spared the need for additional sampling without a reduction in diagnostic yield.

Measure of benefits used in the economic analysis
The measure of benefits used was the number of biopsies and cultures deferred.

Direct costs
The direct costs included the cost of ROSE. The authors also estimated the costs of biopsy and culture that could be saved by a positive ROSE. Charges for each biopsy and culture deferred were calculated on the basis of published 2003 Medicare rates, including bronchoscopist reimbursement and technical and professional fees. If ROSE obviated the need for parenchymal biopsy, fluoroscopy and chest radiograph fees were also included. Endoscopy suite costs were not included. The costs and the quantities were not analysed separately. Discounting was not relevant. The price year was 2003.

Statistical analysis of costs
The authors stated that a nonpaired t-test for continuous data was performed, but the results of the statistical analysis of the costs were not reported.

Indirect Costs
The indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was not reported.

Estimated benefits used in the economic analysis
The use of ROSE in 32 patients obviated the need for 12 microbiological cultures, 15 BAL cytology samples, 15 brushings, 1 endobronchial biopsy and 11 transbronchial biopsies. Fluoroscopy and postprocedural chest radiographs were saved in 9 patients.

Cost results
The total savings resulting from deferring additional biopsy due to ROSE was $8,466 (or $265 per case) at 2003 Medicare reimbursement rates.

Synthesis of costs and benefits
The costs and benefits were not combined.

Authors’ conclusions
Rapid on-site cytologic evaluation (ROSE) during transbronchial needle aspiration (TBNA) allowed the deferment of additional biopsies without loss in diagnostic yield. It probably lowered procedural risk, and was also cost-effective.

CRD COMMENTARY - Selection of comparators
The authors chose bronchoscopy performed without ROSE as a comparator for bronchoscopy performed with ROSE. This allowed the active value of ROSE to be evaluated.

Validity of estimate of measure of effectiveness
The estimate of measure of effectiveness was based on a diagnostic study, which was neither randomised nor blinded. The study sample was representative of the study population, but the authors did not report whether the patient groups were comparable at analysis. Statistical analyses were undertaken to take potential biases and confounding factors into consideration. No power calculations were reported, thus it was not possible to ascertain whether the results obtained were due to the intervention or to chance.

Validity of estimate of measure of benefit
The measure of benefits used in the economic analysis was the number of biopsies and cultures deferred. This was taken from the effectiveness analysis.

Validity of estimate of costs
The analysis of the costs was performed from the perspective of Medicare. Given this perspective, all the relevant categories of costs appear to have been included in the analysis. The cost and the quantities were not analysed separately. The authors stated that a nonpaired t-test for continuous data was performed, but no results for the statistical analysis of the costs were reported. No sensitivity analysis of the quantities was conducted. Discounting was not relevant and, appropriately, was not carried out. The price year was reported, which will aid any future reflation exercises.

Other issues
The authors compared their findings with those from other studies. They did not, however, directly address the issue of generalisability of the results to other settings. The authors do not appear to have presented their results selectively, although they did not report the cost results in detail. The authors’ conclusions reflected the scope of the analysis. The authors did not report any limitations to their study.

Implications of the study
Careful preprocedural planning can predict the possible impact of ROSE, allowing optimised scheduling in institutions.
with limited ROSE availability. TBNA is highly accurate and, in most cases, diagnostic tissue can be obtained with two passes. Histologic biopsy adds a larger incremental gain than taking additional cytologic aspirates.

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