Comparison of ThinPrep and cytopsin preparations in the evaluation of exfoliative cytology specimens

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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
Thinprep (TP) was compared with conventional cytopsins (CS) in the examination of non-gynaecological specimens.

Type of intervention
Other: specimen testing.

Economic study type
Cost-effectiveness analysis.

Study population
The study population was not patient based. Eighty-eight specimens were investigated using both techniques.

Setting
The setting was a laboratory. The economic study was carried out in the USA.

Dates to which data relate
The dates to which the data referred were not explicitly stated. However, since the costs were based on 2005 Medicare costs it is assumed that the effectiveness data were from the same year.

Source of effectiveness data
The effectiveness data were derived from a single study conducted in the USA.

Link between effectiveness and cost data
The costing was carried out prospectively on the same sample as that used for the effectiveness analysis.

Study sample
Power calculations were not reported. It was not stated how the sample was selected, but all specimens were tested using both techniques and the results compared. Eighty-eight specimens in total were evaluated, 38 urine, 13 respiratory and 37 body cavity fluids.

Study design
This was a single-centre cross-sectional study. Since the study was not patient based, there was no follow-up period and therefore no loss to follow-up.
Analysis of effectiveness
The analysis was based on all the specimens that were tested. The primary outcomes were recorded cellularity and the preference of the cytotechnologists. Five cytotechnologists and one pathologist independently examined paired CS and TP specimens. Cellularity was semi-quantitatively graded as low, moderate or high, and preferences were determined by tallying the majority response per individual case.

Effectiveness results
For body fluid specimens, preference was for TP in 30 cases, for CS in 2, and was considered to be the same for 5.

For respiratory specimens, preference was for TP in 6 cases, for CS in 1, and was considered to be the same for 1.

For urine specimens, preference was for TP in 27 cases, for CS in 3 and was considered to be the same for 8.

Overall, TP was preferred in 63 cases, CS was preferred in 6 cases, and no preference was indicated in 19 cases, (p=0.00).

For body fluid specimens, 22 had low, 15 had moderate and 0 had high cellularity by TP, and 18 had low, 13 had moderate and 6 had high cellularity by CS.

For respiratory specimens, 4 had low, 8 had moderate and 1 had high cellularity by TP, and 2 had low, 11 had moderate and 0 had high cellularity by CS.

For urine specimens, 10 had low, 25 had moderate and 3 had high cellularity by TP, and 16 had low, 16 had moderate and 6 had high cellularity by CS.

Overall, 38 had low, 48 had moderate and 4 had high cellularity by TP, and 36 had low, 40 had moderate and 12 had high cellularity by CS.

Clinical conclusions
Cytologists preferred TP over CS in the majority of cases. This preference for TP was demonstrated in all types of specimens and was shown to be statistically significant. Sixty-one of the 88 cases had similar cellularity, with the remaining 27 cases showing variable cellularity. However, better cellularity by either methodology does not appear to have influenced the cytologist's preference.

Measure of benefits used in the economic analysis
There was no summary measure of benefit. The reader is referred to the 'Analysis of Effectiveness' section.

Direct costs
Discounting was not carried out as the costs were incurred during less than 12 months. The costs were limited to labour costs for specimen preparation and for screening, and supply costs. The source of these costs was not stated. Reimbursements were based on Indiana Medicare reimbursement rates. The price year was 2005.

Statistical analysis of costs
No statistical analysis was undertaken.

Indirect Costs
The indirect costs were not included in the analysis.

Currency
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was undertaken.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
The cost of specimen preparation labour was $3.50 for TP versus $2.52 for CS.
The cost of screening labour was $2.50 for both TP and CS.
The supply cost was $7.30 for TP versus $6.55 for CS.
The total cost was $13.30 for TP versus $11.57 for CS.
Reimbursement was $113.62 for TP compared with $63.79 for CS.
Revenue was $100.32 for TP compared with $52.22 for CS.

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

**Authors’ conclusions**
Cytotechnologists and pathologists preferred ThinPrep (TP) over cytospin (CS) in the majority of normal and abnormal cases. It was found that TP and CS had comparable diagnostic sensitivity, similar to other studies. Despite the slight increase in cost, TP is associated with higher reimbursement and profit for the laboratory.

**CRD COMMENTARY - Selection of comparators**
The rationale for the selection of the comparators was clear. Despite numerous studies comparing TP with conventional preparations and fine-needle aspiration, the literature comparing TP with CS in the examination of nongynaecologic specimens was limited.

**Validity of estimate of measure of effectiveness**
The analysis was based on a cross-sectional study, which was appropriate for the study question. The study sample was representative of the study population and, since both techniques were used on the same specimen samples, the groups were comparable for the analysis.

**Validity of estimate of measure of benefit**
No summary benefit measure was used.

**Validity of estimate of costs**
All the categories of cost relevant to the perspective adopted were included in the model. The source of the unit costs was not reported in full. Reimbursement rates were taken from Medicare costs, but the source of the costs related to specimen testing was not stated. The price year was reported, which will assist any future reflaction exercises.
Other issues
The authors made appropriate comparisons of their findings with those from other studies. The issue of generalisability was not addressed. The authors did not present their results selectively and the conclusions reflected the scope of the analysis.

Implications of the study
The authors made no recommendations.

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None stated.

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