Treatment of recurrent respiratory papillomatosis in children with the microdebrider

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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
Children with recurrent respiratory papillomatosis were treated using laryngoscopic techniques involving either a carbon dioxide (CO2) laser or a microdebrider.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised children (aged less than 18 years) with recurrent respiratory papillomatosis.

Setting
The setting was secondary care. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness evidence related to 1998 to 2001. No dates for the resource evidence were given. No price year was given.

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

Link between effectiveness and cost data
This was a retrospective study. The authors aimed to have their cost data applicable to the same patients that provided the effectiveness data. However, the cost data were very incomplete and, therefore, it was unclear whether the costs given accurately reflected the patients' costs.

Study sample
No power calculations to determine the sample size were reported. The authors did not describe the method of sample selection. Eighteen patients who satisfied the inclusion criteria were included in the study. However, only 14 of these underwent treatment with the laser initially before switching to treatment with the microdebrider. Three patients were treated with the microdebrider alone and one patient was treated with the laser alone. One patient who underwent several laser resections and an unplanned tracheotomy was not included because of incomplete records. It was unclear whether this patient was one of the 18 initial patients. A total of 127 procedures were performed using the CO2 laser technique and 50 using the microdebrider.
Study design
This was a within-group comparison study in which 14 patients received both interventions in the same order. The order was not randomised. The methods used to collect the data were not specified.

Analysis of effectiveness
The authors did not report whether all of (and only) the 14 patients who underwent both treatments were included in the analysis. The measures of effectiveness included the number of gross papilloma lesions removed and the number of surgical and anaesthetic complications. The text of the study described anecdotal evidence that the pain was less for patients after microdebrider treatment than laser surgery, but there was no attempt to measure post-treatment pain. The same applied for the risk of airway fire. The patients acted as their own controls.

Effectiveness results
The mean operative time per procedure was 59.2 minutes (range: 8 - 130) when using the CO2 laser and 32.4 minutes (range: 12 - 47) with the microdebrider technique. The mean operative time was less for microdebrider resection, (p<0.0001).

All gross papilloma lesions were removed with both treatments.

No surgical or anaesthetic complications were recorded with either treatment.

Clinical conclusions
There was no difference between the two treatment options in terms of gross papilloma lesions removed and surgical or anaesthetic complications.

Measure of benefits used in the economic analysis
The health technologies were comparable in the effectiveness measures. Thus, in effect, a cost-minimisation analysis was conducted.

Direct costs
No discounting was carried out. However, according to the authors' description of the two technologies and the papillomatosis condition, there would be no need to discount the costs. The authors gave the hourly cost of the operating room and anaesthesia fees at Johns Hopkins Hospital (one of the centres). They also gave the cost of a laser-safe endotracheal tube, a Xomed Tricut laryngeal blade, the cost of a microdebrider and a CO2 medical laser. The costs were not broken down into prices and quantities. Although the authors gave the cost difference between the two procedures, and the costs were derived from actual data, they did not report the cost of each procedure. No price year was given.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
No indirect costs were calculated.

Currency
US dollars ($).
Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
There was no summary measure of benefit. See the 'Effectiveness Results' section.

Cost results
The treatment of respiratory papillomatosis cost $300 less per procedure with the microdebrider than with the CO2 laser.

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

Authors' conclusions
There was no difference in the effectiveness measures between the groups. The cost of treatment with the microdebrider was less than that with the laser, due to the reduced operative time and need for expensive specialised equipment. Therefore, the microdebrider provided the most cost-effective treatment.

CRD COMMENTARY - Selection of comparators
The choice of the comparator, CO2 laser ablation, was justified by its description as having been, until 2000, the main method used by the authors to treat papillomas. You should decide if this is a valid comparator for your own setting.

Validity of estimate of measure of effectiveness
The effectiveness data were obtained from a within-group comparison study. It examined the authors' experience throughout a period in which microdebrider treatment was gradually being introduced until it became the standard treatment in the authors' setting. The patients underwent both types of treatment. The study design was open to procedural bias as it could be difficult to distinguish the source of the outcomes, for instance, change in the intervention or time-related factors. However, no difference was noted in the outcomes measured. Since there was no information on the patients' characteristics, it was not possible to know whether they were representative of the study population. There may have been other important measures of effectiveness that were not analysed in this study.

Validity of estimate of measure of benefit
No summary measure of benefit was used in the economic analysis.

Validity of estimate of costs
The cost analysis had several weaknesses. The costs per procedure were not broken down into prices and quantities. Some price information was given, but no price year was stated. In addition, there was no attempt to derive a cost per procedure from the cost of the capital equipment, although the operating room costs per procedure could be deduced from the information given.

No indirect costs were included, and, as the main information on the two procedures was the difference in time taken, this might have supported the authors' conclusions in favour of the microdebrider technique.

There was very little information on the quantities, apart from the time taken for each procedure and, therefore, how much operating room time was used. All the data came from the single study. No statistical analysis or sensitivity analysis of the quantities was carried out.
Other issues
The authors compared their results with those from other studies, but did not address the issue of generalisability. The authors did not present their results selectively. In addition, while they seemed aware of the limitations of such a retrospective type of study in terms of the effectiveness evidence, and the limited assessment of the patients’ outcomes, they did not appear to be aware of the limitations of the cost data they presented.

Implications of the study
The authors recommend a prospective study, which would attempt to assess postoperative pain, vocal quality and the efficacy of resection. Such a study should include a more detailed breakdown of the costs into prices and quantities, in such a way that the cost for each procedure can be broken down into its components.

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None stated.

Bibliographic details

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MeSH
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