Valuing reduced antibiotic use for pediatric acute otitis media

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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 objective was to assess the costs and benefits associated with reduced antibiotic use in the treatment of acute otitis media for children aged under two years. The author concluded that reduced antibiotic use was unlikely to be acceptable from a parental perspective. Overall, there were a number of limitations associated with the reporting of this study and as a consequence the results cannot be validated.

Type of economic evaluation
Cost-utility analysis

Study objective
The aim was to assess the costs and benefits associated with reduced antibiotic use, and therefore reduced antibiotic resistance in the treatment of acute otitis media for children aged under two years.

Interventions
Reduced antibiotic use, according to guidelines issued by the American Academy of Pediatrics, was compared with usual practice. These guidelines recommend that clinicians instruct parents to consider the advantages and disadvantages of antibiotics for the treatment of acute otitis media.

Location/setting
USA/primary care.

Methods
Analytical approach:
A decision analytic model was developed to estimate the outcomes associated with reduced antibiotic use. Some of the details for the model were presented in an accompanying paper, but these are not included or critique here. The time horizon was not explicitly reported, but the author has subsequently informed us that the time horizon for the model was one year, and the time horizon for antibiotic resistance included in the guidelines infinite. The authors stated the perspective was parental.

Effectiveness data:
The effectiveness data were derived from a previous study, in which the current author was involved and which was published in the journal alongside this publication. The main clinical parameters were antibiotic use, adverse drug events and adverse drug event deaths.

Monetary benefit and utility valuations:
The quality of life estimates were obtained from published studies, one of which used the standard gamble technique to estimate the parental utilities.

Measure of benefit:
The measure of benefit was quality-adjusted life-days (QALDs) gained.

Cost data:
The cost estimates were not developed in this analysis, but were taken from the accompanying study. The cost analysis included the cost of parents’ time. All costs were reported in US dollars ($) and all, including sick days, hospitalisations and dollar costs, were converted into QALDs lost. This conversion was performed using a willingness to pay threshold.
of $100,000 per QALY for the base case. Cost values used were presented in full.

**Analysis of uncertainty:**

A one-way sensitivity analysis was performed on some of the model inputs.

**Results**

For a child aged between two and six months, the incremental benefits with the intervention to reduce antibiotic use were 0.00773 and the incremental costs were 0.10587 QALDs over no intervention, giving a difference of 0.09814 QALDs. The author estimated that parents would need to value the resistance benefit at 0.77 QALDs per antibiotic prescription avoided for the benefits from the guidelines to balance their costs.

For those aged six to 24 months, the incremental QALDs gained were 0.00940 and the incremental costs were 0.11360 QALDs with the intervention over no intervention, giving a difference of 0.10420. The author estimated that parents would need to value the resistance benefit at 0.67 QALDs per prescription avoided.

These results were sensitive to the dollar cost utility: when the willingness-to-pay ranged from $20,000 to $200,000 per quality-adjusted life-year, the results ranged from 0.36 to 4.10 QALDs for the two- to six-month-olds, and 0.30 to 3.57 QALDs for the six- to 24-month-olds.

**Authors' conclusions**

The author concluded that reduced antibiotic use for paediatric acute otitis media to avoid antibiotic resistance was unlikely to be acceptable from a parental perspective.

**CRD commentary**

**Interventions:**
The intervention was well described, and was recommended for use by the American Academy of Pediatrics in the author's setting.

**Effectiveness/benefits:**
The effectiveness data were largely derived from one study, in which the current author was involved. To fully assess their validity the reader is referred to Wong et al 2009 (see 'Other publications of related interest' below for bibliographic details). The outcome used was the QALD which was appropriate as it captures the impact of the intervention on the quality and length of life. The details of the sources and methods used to derive the quality weights were given.

**Costs:**
The costs analysis was generally poorly reported and no details of the cost categories were given. Again, it is suggested that full details are reported in Wong et al. The increase in dollar costs associated with the intervention was reported, but it was unclear what these additional costs contained. No unit costs or resource quantities were provided. The costs were converted into QALDs and the method used for conversion was reported and the threshold tested in sensitivity analysis.

**Analysis and results:**
An incremental analysis was not performed; instead the net loss in QALDs was used to estimate how much parents would need to value decreased antibiotic resistance. Obtaining some valuation of future antibiotic resistance seems to be the main focus of the paper. The impact of uncertainty in the model parameters on the results was investigated and the results were reported. Given the US parental perspective, the limited reporting of the cost data, and the reliance on one study for the effectiveness estimates, it may be difficult to generalise the results to other settings. The author acknowledged some limitations of this analysis.

**Concluding remarks:**
A large amount of information was reported in an accompanying paper, a critique of which is not within the scope for this abstract. Due to this a validation of the results is not possible.
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