Palivizumab for respiratory syncytial virus prophylaxis in high-risk infants: a cost effectiveness analysis

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 use of prophylactic palivizumab therapy (PPT), a humanised monoclonal antibody, to reduce the number of respiratory syncytial virus (RSV)-related hospitalisations in preterm infants.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised preterm infants with a gestational age of less than 35 weeks.

Setting
The setting was the community. The economic study was carried out in Philadelphia, PA, USA.

Dates to which data relate
The effectiveness evidence was gathered between 1981 and 1998, whilst the resources were measured in 1996 and 1997. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from published studies.

Modelling
A decision-analytical model was used to simulate the course and the costs of an RSV infection during the season from November to April. The analysis modelled infants with a gestational age of less than 35 weeks.

Outcomes assessed in the review
The outcome measure was the incidence rate of RSV infection.

Study designs and other criteria for inclusion in the review
Not specified.
Sources searched to identify primary studies
MEDLINE was searched for studies published between 1966 and 1999.

Criteria used to ensure the validity of primary studies
Not reported.

Methods used to judge relevance and validity, and for extracting data
Not reported.

Number of primary studies included
Eight primary studies were included in the review.

Methods of combining primary studies
The primary studies were combined in a narrative.

Investigation of differences between primary studies
Not carried out.

Results of the review
The incidence rate of RSV infection was 5% in the PPT group, and between 10 and 38% in the control group.

Measure of benefits used in the economic analysis
The measure of benefit in the economic analysis was the number of occurrences of RSV infection prevented.

Direct costs
The costs were not discounted. The costs included in the model were those for hospitalisation, medical procedures, laboratory tests, RSV antigen tests, physician office visits, emergency department visits, home health care visits, and medication. The amount of resources used was obtained from the literature, whilst the costs were derived from an academic medical centre. The drug prices were obtained from the manufacturer. The resource/cost boundary was that of the hospital services. The total cost of the strategies was estimated, based on the decision model. The resources were measured in 1996 and 1997. The price year was not reported.

Statistical analysis of costs
No statistical analysis of costs was carried out.

Indirect Costs
Indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were undertaken to investigate variation in the data. The analyses were performed for the rate of
incidence of RSV infection, the cost of PPT, the cost of RSV-related hospitalisation, the number of physician office visits, and the number of home health care visits.

**Estimated benefits used in the economic analysis**
The number of occurrences of RSV infection prevented was based on the incidence of RSV infection found in the literature. This was 5% for the PPT group and 10 to 38% for the control group.

**Cost results**
The base cost per RSV infection was estimated through the model, and was found to be $10,486 for both the PPT and control groups. The cost of PPT varied between $2,500 and $4,500 per prophylactic course.

**Synthesis of costs and benefits**
The effectiveness measure used in the model, i.e. RSV infection rates, ranged from 5% in the PPT group to 10 to 38% in the control group. The incremental cost per RSV occurrence prevented over this range was between $2,072 and $79,706 per treatment when the cost of palivizumab was $4,500 per prophylactic course. When the cost of palivizumab was $2,500 per prophylactic course, the incremental cost per RSV occurrence prevented was between $0 and $39,591 per treatment. The results were sensitive to changes in hospitalisation costs. Variations in the remaining parameters did not affect the base-case findings.

**Authors' conclusions**
The analysis demonstrated that the advantages of PPT depended on changes in the incidence of RSV infection in infants not receiving PPT, the average cost of RSV-related hospitalisation, and the cost of palivizumab.

**CRD COMMENTARY - Selection of comparators**
The rationale for the choice of the comparator was clear: given that the main health technology was a specific drug, the authors compared it with the no treatment option. You should consider whether the comparator represents current practice in your own setting.

**Validity of estimate of measure of effectiveness**
Although relevant primary studies for the systematic review of the literature were identified through a database search, the methods and the conduct of the review were not reported satisfactorily.

**Validity of estimate of measure of benefit**
The measure of benefit was taken directly from the literature. This measure seemed appropriate for the disease being studied, despite the concerns about the methodology and the conduct of the review.

**Validity of estimate of costs**
The quantities and costs were not reported separately, and thus the generalisability of the results to other setting may be limited. Several sensitivity analyses were performed in order to address this issue. As the authors recognised, the costs relating to adverse events were not included in the model and this could bias the estimation of total costs. The indirect costs were also not considered and the impact of RSV infection on families of high-risk infants (intangible costs and benefits) could be relevant.

**Other issues**
The robustness of the results was tested using sensitivity analyses. The authors highlighted some limitations of the analysis. Due to the lack of more recent data, many model inputs, such as resources used and RSV-incidence rate, were
derived from a single published article of a randomised clinical trial. In addition, cost data were drawn from an urban academic centre, which usually exhibits higher costs compared with non-academic medical institutions. The authors did not consider other drug therapies as possible comparators for PPT, such as intravenous RSV immune globulin.

Implications of the study
The authors suggested that further research on the cost-effectiveness of PPT for high-risk preterm infants was needed. This should consider the societal implications of PPT, such as the value of intangible benefits.

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