Cost-effectiveness of universal prophylaxis in pregnancy with prior group B streptococci colonization

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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 evaluate the cost-effectiveness of screening for group B streptococci compared with universal treatment at term of pregnancy for women with a history of group B streptococci colonisation in a previous pregnancy. The authors concluded that universal treatment was more cost-effective than screening then treating only those infected. The methods were generally good and they and the results were adequately reported. Given the scope of the study, the authors' conclusions appear to be valid.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of screening for group B streptococci compared with universal treatment at term of pregnancy for women with a history of group B streptococci colonisation in a previous pregnancy.

Interventions
The study compared screening against universal treatment for group B streptococci at term of pregnancy for women with a history of colonisation in a previous pregnancy.

Location/setting
USA/out-patient secondary care.

Methods
Analytical approach:
A decision analytic model was used to assess the costs and outcomes of the two interventions. The lifetime of the mother was the time horizon and the authors reported that a societal perspective was adopted.

Effectiveness data:
The baseline efficacy of antibiotic prophylaxis during labour, the probabilities for each strategy, and the outcomes were derived from a systematic review of the literature, including a search of the references of identified relevant articles. The authors searched PubMed, Scopus, the Cochrane Library, the Centers for Disease Control and Prevention’s guidelines, and the Internet, using Knowledge Finder, for reports from 1966 to January 2009. The search strategy was reported. The main effectiveness parameter was the probability of the recurrence of group B streptococci colonisation.

Monetary benefit and utility valuations:
The utilities were taken from published sources.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs) gained. As these outcomes could be generated over the lifetime of the patient, future benefits were discounted at an annual rate of 3%.

Cost data:
The costs included those associated with screening, intrapartum antibiotic prophylaxis, treatment for maternal anaphylaxis and death, evaluation of newborns whose mother received antibiotic prophylaxis, and treatment of term
neonatal early-onset group B streptococcal sepsis. The cost data were derived from a variety of published studies and fee schedules from government-sponsored insurance companies. All costs were inflated to 2008 prices and reported in US dollars ($). As they could be incurred over the lifetime of the patient, future costs were discounted at an annual rate of 3%.

Analysis of uncertainty:
A series of one-way sensitivity analyses was undertaken by varying the values of all the model parameters.

Results
For a cohort of 300,000 infants born to mothers colonised with group B streptococci in previous pregnancies, the QALYs gained compared with no treatment were 1,637 for universal treatment and 1,607 for screening and treatment. The total costs were $15,250,603 for universal treatment and $21,607,013 for screening and treatment.

Compared with screening and treatment, universal treatment resulted in cost savings of $209,988 per QALY gained and was dominant, as it was less costly and more effective.

The sensitivity analyses showed that, even at an incidence of recurrent group B streptococci colonisation of 10%, universal treatment remained cost-effective.

Authors’ conclusions
The authors concluded that universal treatment at term of pregnancy for women with a history of group B streptococci colonisation was more cost-effective than screening with treatment for those who tested positive.

CRD commentary
Interventions:
The interventions were reported clearly and in detail. Screening and treatment was the comparator, as this was the strategy recommended by US guidelines at the time.

Effectiveness/benefits:
The methods used to obtain the clinical and effectiveness estimates for the model were reported in full. The authors searched a number of databases and the references of relevant articles and it would appear that all the relevant evidence was considered. The search strategy was adequately reported, but very few details were reported for the health state valuations and the sources from which the utilities were derived.

Costs:
The authors reported that a societal perspective was adopted, but no productivity losses seem to have been included. The impact of their exclusion is not clear. All the relevant major direct health care costs appear to have been included. The sources from which this cost information was derived were adequately reported. The price year, time horizon, and discount rate were all reported.

Analysis and results:
The costs and outcomes were synthesised using a decision tree model and adequate details of this model were reported, including a diagram. A series of one-way sensitivity analyses was undertaken to assess the impact of uncertainty in the model parameters. This type of analysis goes some way toward assessing the model uncertainty, but probabilistic sensitivity analysis could more thoroughly assess the overall model uncertainty. The main limitation, as reported by the authors, was that the analyses only focused on the prevention of early-onset group B streptococcal neonatal sepsis and did not consider the costs and outcomes associated with late-onset sepsis.

Concluding remarks:
The methods were generally good and they and the results were adequately reported. Given the scope of the study, the authors’ conclusions appear to be valid.

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