Early-onset neonatal group B streptococcal sepsis: economics of various prevention strategies
Garland S M, Kelly N

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
Prevention strategies for early-onset neonatal group B streptococcal sepsis.

Type of intervention
Screening and primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Pregnant women with and without obstetric risk factors.

Setting
The setting was hospital obstetric centres. Australian data were used where possible.

Dates to which data relate
No dates were given in the text but publication dates of data sources were given in the reference list.

Source of effectiveness data
Review of studies and opinions.

Link between effectiveness and cost data
The costs are not based on the same patient sample as the effectiveness data.

Modelling
Decision tree modelling was used to estimate final costs and outcomes.

Outcomes assessed in the review
The outcome measures were baseline probabilities such as neonatal GBS infection rate under different situations, e.g. with and without the presence of perinatal risk factors, performance of the screening test, neonatal death of infected babies, and onset of neonatal sepsis when mother is a carrier.

Study designs and other criteria for inclusion in the review
None given.

Sources searched to identify primary studies
None given.

Criteria used to ensure the validity of primary studies
None given.

Methods used to judge relevance and validity, and for extracting data
None given.

Number of primary studies included
10 studies are referenced in the table of input information.

Methods of combining primary studies
None given.

Investigation of differences between primary studies
None carried out.

Results of the review
Event probability of:
- antenatal GBS screening positive: 0.14;
- mother screening negative for GBS but positive at delivery: 0.085;
- mother screening positive for GBS and positive at delivery: 0.4779;
- anaphylaxis after intrapartum chemoprophylaxis: 0.0001;
- early-onset GBS sepsis after intrapartum chemoprophylaxis: 0;
- chance of neonatal GBS infection occurring when mother has perinatal risk factors: 0.82;
- neonatal GBS infection rate when the mother has perinatal risk factors: 0.1886;
- neonatal GBS infection rate when mother has no perinatal risk factors: 0.0046;
- overall neonatal sepsis rate when mother is a GBS carrier: 0.023;
- neonatal death of infected babies: 0.28.

Methods used to derive estimates of effectiveness
The authors’ assumptions or personal communications were used to estimate effectiveness parameters.

Estimates of effectiveness and key assumptions
The probabilities of events were as follows and treatment was assumed 100% effective in all cases;

antenatal screening compliance: 0.98;
maternal intrapartum chemoprophylaxis compliance: 0.98;
early onset GBS sepsis rate proportional to total GBS sepsis rate: 0.86.

Measure of benefits used in the economic analysis
The measure of benefits was the cases prevented and deaths prevented.

Direct costs
Costs measured included laboratory test, chemophrophylaxis, anaphylactic reaction after chemoprophylaxis, and treatment of neonatal sepsis. The first and last were taken from references, the other two were estimated or obtained through personal communication. Costs were those incurred in a public institution. No costs of medical time were included. The price dates were not given but the two references were from publications in 1993 and 1994.

Currency
Australian dollars (Aus $).

Sensitivity analysis
A sensitivity analysis was reported to have been carried out on the compliance rate of screening, but there was not enough space to print it. The authors stated that it is available on request.

Estimated benefits used in the economic analysis
With no intervention, there would be 692 cases of early-onset neonatal group B streptococcal sepsis per year.

Under strategy 1 there would be 375 cases per year, representing 46% of cases prevented, 89 deaths prevented and 33,614 mothers treated.

Under strategy 2, these figures become 432 cases per year, 38% of cases prevented, 73 deaths prevented and 3,361 mothers treated.

Under strategy 3, these figures would be 136 cases per year, 80% of cases prevented, 156 deaths prevented and 24,500 women treated.

Cost results
With no intervention, there would be a total cost of Aus$10.73 million. Under strategy 1, the total cost would be Aus$7.92 million, with a net benefit of Aus$2.81 million. Under strategy 2 these figures would be Aus$8.62 million with a net benefit of Aus$2.11 million. Under strategy 3 these figures become Aus$2.26 million with a net benefit of Aus$8.47 million.

Synthesis of costs and benefits
With no intervention, the cost/case prevented would be zero. Under strategy 1 the cost/case prevented would be 6,663; under strategy 2, the ratio would be 7,416; under strategy 3 the ratio would be 270. The authors reported that the sensitivity analysis showed that varying the compliance rate of screening had an impact on the cost.

Authors’ conclusions
All prevention strategies were more cost-effective than none at all. Strategy 3 appeared to be the most cost-effective strategy but it had not been clinically evaluated.

CRD Commentary
The review lacks clear search methods and inclusion criteria and details of how the figures were derived. Similarly no information is given on the derivation of the cost information or indeed when the figures relate to. However, all the data that the authors used was presented in the study. The inclusion of the sensitivity analysis would have been helpful.

Bibliographic details

PubMedID
7746174

Indexing Status
Subject indexing assigned by NLM

MeSH
Cost-Benefit Analysis; Decision Trees; Female; Hospital Costs /statistics & numerical data; Hospitals, Teaching /economics; Humans; Infant, Newborn; Infection Control /economics; Infectious Disease Transmission, Vertical /economics /prevention & control; Mass Screening /economics; Sepsis /economics /microbiology /prevention & control; Streptococcal Infections /economics /prevention & control /transmission; Streptococcus agalactiae; Victoria

AccessionNumber
21995000607

Date bibliographic record published
26/06/1997

Date abstract record published
26/06/1997