Cost-effectiveness of antenatal anti-D prophylaxis
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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
Using different regimens of routine antenatal Anti-D prophylaxis (AADP) in Rh D negative-pregnant women.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Rh D-negative pregnant women.

Setting
Hospital. The economic study was carried out in Scotland.

Dates to which data relate
The data collected for the effectiveness analysis were obtained primarily from studies published in 1978, 1987 and 1989. The quantities of resources were estimated based on data from the period between 1987 and 1991. The prices used were from 1995.

Source of effectiveness data
Review of previously completed studies.

Modelling
A model was used in order to estimate net cost of AADP.

Outcomes assessed in the review
The outcome assessed was the rate of reduction of Rh D-alloimmunization.

Study designs and other criteria for inclusion in the review
Study design was not reported. The published literature used as references for some effectiveness data were reported to include a clinical trial, an open study with historical controls and a prospective cohort study.

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

Methods used to judge relevance and validity, and for extracting data
Not reported. The data were extracted by means of summary statistics.

Number of primary studies included
Three studies were included.

Methods of combining primary studies
Not combined.

Investigation of differences between primary studies
Not reported.

Results of the review
The estimated rate of reduction of Rh D-alloimmunization for the 2 x 500 iu regimen was 80%. The same rate for the 2 x 1250 iu regimen was 94%. The corresponding figure for the 1 x 1250 iu regimen was 85%.

Measure of benefits used in the economic analysis
The outcome measure used in the analysis was the number of Rh D-alloimmunization prevented and the number of Rh HD losses prevented (per 1,000 women at risk). The values corresponded to data on incidence for a cohort observed during the period 1987-1991, and during 1992-1993.

Direct costs
The costs were discounted. Quantities were not reported (a previously published report of the cost breakdown was referred to in the paper). The costs measured were operating costs (drugs, prenatal, delivery and postnatal care) and costs of complications. The costs were based on actual data, published reports and assumptions. Some quantities were measured in the period 1987-1993. The prices used were those prevailing in 1995. The authors reported that the cost of child care for children disabled by HD and the cost of counselling given by paediatricians to those children's mothers were not considered in the analysis.

Statistical analysis of costs
95% confidence intervals (CI) were reported.

Indirect Costs
Not considered.

Currency
UK pounds sterling (£).
Sensitivity analysis
The variables used and reported in the analysis were reduction in the Rh D-alloimmunization rate per 1,000 women at risk and cost of a vial of anti-D IgG. One-way and two-way simple sensitivity analyses were carried out.

Estimated benefits used in the economic analysis
The reduction in Rh D-alloimmunization cases, per 1,000 women at risk, was 7.8 for the 2 x 1250 iu regimen, 7.1 for the 1 x 1250 iu regimen and 6.6 for the 2 x 500 iu regimen. The estimated Rh HD losses prevented, per 1,000 women at risk (calculated by multiplying the corresponding rates reported in the ‘results of the review’ section by 0.5713), were 0.537, 0.4856, and 0.457, respectively.

Cost results
The net cost of the 2 x 1250 iu regimen was estimated to be 11,419.2 for primigravidae, and 42,229.2 for all women at risk. The net cost for the 1 x 1250 iu regimen was estimated to be -8,321.2 for the primigravidae group only, and 8,434.8 for all women. The net cost of the 2 x 500 iu regimen was estimated to be -1,300.2 for the primigravidae group and 18,354.6 for all the women at risk. The discount rate used in all cases was 6%.

Synthesis of costs and benefits
The estimated benefits and costs were combined by an incremental cost per Rh D-alloimmunization prevented (against the ‘do-nothing’ option and for all women against the primigravidae only group) and by the incremental cost per Rh HD loss prevented (comparisons as before). The discount rate used was 6% for costs and benefits. The incremental costs per Rh D-alloimmunization prevented results were as follows:

primigravidae versus do-nothing, the 2 x 1250 iu regimen, 1,464; the 1 x 1250 iu, -1172; the 2 x 500 iu regimen, -197.

For all women versus do nothing the corresponding figures were 5,414, 1,188, and 2,781, respectively.

For all women versus primigravidae, the results were 8,272, 2,915, and 4,908, respectively.

The figures represented 1995 prices. The two-way sensitivity analysis yielded neutral lines (net cost of AADP equal to zero) for the 1 x 1250 iu regimen higher for primigravidae than for all women and also higher than the neutral lines for the rest of the dose regimens (the cost of a vial of anti-D IgG was set on the y-axis). The authors summarised the sensitivity analysis by stating that "the ordering of primigravidae versus all women programmes, and of different dose protocols, in terms of their cost-effectiveness is fairly robust".

Authors' conclusions
The authors concluded that: "Programmes for Rh D negative primigravidae are more cost-effective than the same dose protocol extended to all Rh D negative women. The 1 x 1250 iu programme is the most cost-effective option... The model (cost estimation) facilitates the introduction of any local values a decision maker might wish. However further work is required, in particular on the value women place on the reduction in risk due to prophylaxis, and the costs of anti-D IgG given major increases in demand." Improved information is also required on the effectiveness of AADP.

CRD COMMENTARY - Selection of comparators
The reason for the choice of comparator is clear.

Validity of estimate of measure of benefit
The validity of the study may be affected by the quality of original studies included in the literature review, the study inclusion criteria, the criteria for the judgement of validity of studies and the analysis of difference between studies and how these differences could have influenced the results. None of these were reported in the study.
Validity of estimate of costs
The quantities of resources used were not reported separately from the prices. Adequate details of cost estimation (cost breakdown) were reported. The authors reported that the cost of child care for children disabled by HD and the cost of counselling given by paediatricians to those children's mothers were not considered in the analysis (this was thought to underestimate the costs saved by the AADP, whilst not altering the results qualitatively).

Other issues
The authors' conclusions were justified mainly on the grounds of the sensitivity analysis. The generalisability of the study results was not addressed (outside of Scotland). No appropriate comparisons were made with other studies apparently based on the statement that the present study represented "a fuller evaluation of AADP than has been performed to date". The results were not presented selectively.

Bibliographic details

PubMedID
8880168

DOI
10.1002/(SICI)1099-1050(199607)5:43.0.CO;2-6

Indexing Status
Subject indexing assigned by NLM

MeSH
Cohort Studies; Cost-Benefit Analysis/methods/statistics & numerical data; Dose-Response Relationship, Drug; Erythroblastosis, Fetal/economics/prevention & control; Female; Forecasting; Health Care Costs/statistics & numerical data; Health Services Research/economics/methods; Humans; Infant, Newborn; Models, Economic; Parity/immunology; Pregnancy; Prenatal Care/economics/methods; Quality-Adjusted Life Years; Retrospective Studies; Rho(D) Immune Globulin/administration & dosage/economics; Scotland; State Medicine/economics; Value of Life

AccessionNumber
21996008221

Date bibliographic record published
31/07/1999

Date abstract record published
31/07/1999