Ante-natal screening for hepatitis B surface antigen: an appraisal of its value in a low prevalence area
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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
Routine antenatal screening for maternal hepatitis B surface antigen (HBsAg) versus targeted screening of women with an obvious risk factor followed by vaccine treatment.

Type of intervention
Screening and treatment.

Economic study type
Cost-effectiveness study.

Study population
All pregnant women in East Anglia.

Setting
The setting was the antenatal services of the NHS East Anglia Region. The economic study was carried out in Dundee, UK.

Dates to which data relate
Dates of effectiveness, resource and cost data were not clearly stated.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was not conducted on the same patient sample as that used in the effectiveness study. Costing was undertaken retrospectively.

Study sample
The study sample was a hypothetical cohort of 26,500 pregnant women expected in one year in East Anglia.

Study design
The study design was a hypothetical case series of all pregnant women in one year in East Anglia.
Analysis of effectiveness
The primary health outcomes used were the number of chronic HBV carriers, caused by perinatal transmission, prevented. Life years saved were also estimated.

Effectiveness results
The routine screening programme would result in an annual 2.6 neonatal carriers prevented and an annual 3.1 childhood carriers prevented. Assuming a normal life span of 72 years, this represents a gain of 6.7 life years per carrier.

Clinical conclusions
Current practice identified 7 surface-antigen positive mothers in 26,500 pregnancies per year, whereas 22 were expected. Routinescreening should prevent 0.8 deaths per year later in life at a median age of 45 and would result in the saving of 21 life years.

Modelling
A decision tree was used to model effectiveness outcomes.

Measure of benefits used in the economic analysis
Childhood carriers prevented and life-years saved.

Direct costs
Some costs and quantities were reported separately. The costs involved in the envisaged programme fell into 2 categories:

1. the costs involved in the screening (the extra testing involved) and

2. responding to a positive screening test, further costs involved confirmatory tests, tests to establish HBeAG status and anti-HBe status and the costs involved in treating the children of women who were anti-HBe negative (a course of 3 doses of vaccine and HBIG).

Costs were considered from the point of view of the Health Service provider. Costs were calculated for screening test kits, increased overheads involved in the greater number of tests, confirmatory tests, 3 dose of vaccine and HBIG. The costs of testing kits were estimated by the Regional Blood Transfusion Service. A separate estimate of the costs of tests was provided by the Cambridge Public Health Laboratory at Addenbrooke's Hospital. Costs were not discounted.

Currency
UK pounds Sterling (£).

Sensitivity analysis
To test final cost-effectiveness, sensitivity analyses were carried out on the following parameters:

cost of test kits,

both higher and lower maternal HBsAg prevalence,

the percentage of maternal HBsAg carriers positive for HBeAG

uptake or compliance,
sensitivity and specificity of laboratory tests for HBsAg test,

Zero secondary benefits,

risk of infant carrier per anti-HBe positive mother,

and increase in secondary benefits.

All tests were one-way simple analyses and used only one alternative level.

**Estimated benefits used in the economic analysis**
The routine screening programme would result in an annual 2.6 neonatal carriers prevented and an annual 3.1 childhood carriers prevented. Assuming a normal life span of 72 years this represents a gain of 6.7 life years per carrier. Benefits were not discounted.

**Cost results**
Only costs for the universal routine screening programme were given. The total additional cost for the routine screening programme was 51,560. Costs were not discounted. Costs and prices were given for one year only, but the year was not stated.

**Synthesis of costs and benefits**
The incremental direct cost per childhood carrier prevented was 16,450, and the incremental direct cost per life year saved was 2,437. These results were sensitive to the prevalence of HBsAg, the screening test cost, assumptions about the prognosis for chronic carriers and the proportion of pregnant HBsAg carriers who were also HBeAG positive. Detailed figures for these were not given in the text although a bar chart showed each of these variables resulting in a possible high cost of 4000-5000 per undiscounted life year gained.

**Authors' conclusions**
Routine prenatal screening for maternal HBsAg conformed well to the criteria for a good screening test and was justifiable on medical and economic grounds. It should be introduced without delay.

**CRD Commentary**
This study has had to make many assumptions, in particular its estimates of costs were not well founded and the results were sensitive to changes in the costs of test kits. This means that the results lack robustness. The lack of a base date for the estimation of costs creates ambiguity in interpreting the data.

**Source of funding**
None stated.

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