Cost-benefit analysis of screening for toxoplasmosis during pregnancy

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
Screening and health education versus a health education without screening option, for primary toxoplasma infections during pregnancy.

Type of intervention
Screening; treatment; primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Pregnant women.

Setting
The practice setting was the primary care sector. The economic study was conducted in Finland and in Australia.

Dates to which data relate
The year to which the effectiveness data refer was not specified. The resource use data were taken from two studies published in 1992 and 1993. 1990 prices were used.

Source of effectiveness data
Evidence for final outcomes was based on a review of previously completed studies.

Modelling
Decision tree analysis was used.

Outcomes assessed in the review
The following outcomes were used as part of the assessment; prevalence, incidence, participation rate, transmission rate, number of infected offspring, death, severe infection, subclinical infection and the effectiveness of the treatment.

Study designs and other criteria for inclusion in the review
For some of the outcomes considered, the study designs were unclear. However, the prevalence, incidence and participation rate were based on a prospective cohort study. No inclusion or exclusion criteria were stated.
Sources searched to identify primary studies
Not stated.

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

Methods used to judge relevance and validity, and for extracting data
The judgement criteria used to assess the validity of the primary studies was not stated.

Number of primary studies included
Reference was made to three studies, however the study types were not clearly reported.

Methods of combining primary studies
Different primary studies were used for different model input probabilities.

Investigation of differences between primary studies
Not stated.

Results of the review
The following baseline data were used in the decision tree; a prevalence of 20.3%, an incidence of 2.4 per thousand, a participation rate of 90.2% and a transmission rate of 40%. For the hypothetical screen option (no-screen option in brackets) the total number of exposed offspring was 149.65 (127), 0.75 (1.5) died, 25 (5) had severe infection, 21.9 (43.5) had subclinical infection and 102 (77) were healthy.

Measure of benefits used in the economic analysis
Benefits used included the number of healthy children for the screen and no-screen alternatives. Deaths, severe infection and subclinical infections were also reported.

Direct costs
Future costs were discounted at a rate of 4%. The authors stated that this rate was common practice in Finland. Details of costs, but not quantities, were provided. Costs included were tests, in-patient care, outpatient care, long term institutionalisation, travel costs, treatment of mothers, and treatment of children. The costs included correspond to the hospital, the health service and the patient perspective. The source of specific costs was based on previously published studies. Although not stated, the societal perspective was adopted. Total direct costs were derived using a decision tree. The price data refer to 1990. The costs of health education were excluded as they were assumed to be the same for the intervention and the comparator.

Statistical analysis of costs
Not stated.

Indirect Costs
These were discounted at a rate of 4%. Quantities were not reported separately from costs. The costs measured were those of productivity losses. The costs were borne by both the patient and his/her relatives. A decision tree was used to derive these estimates. The price data was 1990.
Currency
US dollars ($) after converting Finmarks at the 1990 average exchange rate.

Sensitivity analysis
Sensitivity analysis was performed on the effectiveness data and the discount rate in order to test for variability in the data. One-way and two-way sensitivity analyses were performed as well as threshold analysis.

Estimated benefits used in the economic analysis
The authors reported that screening was beneficial if the treatment was effective in 36% of cases.

Cost results
The annual cost per pregnancy was $95.1 in the screen and $128.2 in the no screen option.

Synthesis of costs and benefits
Benefits were not combined with costs in the economic analysis. The authors stated that the net annual savings in total costs (direct and indirect) would amount to $2.09 million. For a transmission rate of 40% and 50% effectiveness of treatment, the threshold value for incidence of maternal primary infection during pregnancy was shown to be 1.1/1,000. The higher the incidence of maternal primary infection, the more favourable the screening option becomes. Below this incidence threshold, results favour the no-screen option. Net savings were shown to be positively associated with increasing transmission risk, effectiveness of treatment or participation rate and inversely related to the discount rate. With a 25% rate of transmission, screening would be worthwhile at the level of about 36% effectiveness of treatment.

Authors' conclusions
The present analysis shows that screening together with health education can be beneficial even in a 'low risk' country. Therefore screening for primary toxoplasma infections during pregnancy should be considered.

CRD Commentary
This study is called a cost-benefit analysis with cost savings being interpreted as benefits. If current costs are considered, the results show an advantage for the screen over the no-screen option. Commonly, the type of analysis undertaken is better described as a cost-consequence analysis, which is a subset of cost-effectiveness analysis. As the authors noted, health education costs were excluded (common to both strategies), as were the cost of death, psychological burden of the screening process and costs of behavioural disorders and mild neurological sequelae. The choice of comparator was clear.

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