The cost-effectiveness of human immunodeficiency virus screening in pregnancy

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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
HIV screening in pregnancy.

Type of intervention
Primary prevention; screening.

Economic study type
Cost-effectiveness analysis.

Study population
Hypothetical cohort of women entering prenatal care before 34 weeks' gestation. This gestational age was the cut-off used to exclude subjects from the recent trial of zidovudine in pregnancy conducted by the National Institutes of Health (NIH).

Setting
Antenatal clinic of a University hospital. The economic study was carried out in San Francisco, California, USA.

Dates to which data relate
The main effectiveness data were taken from published studies dated 1989/1994. Resource and cost data were mainly derived from 1988-94 sources. Resource use was valued using 1993 prices.

Source of effectiveness data
Effectiveness data were derived from a review of previously completed studies.

Modelling
A decision analysis model was used to integrate probabilities and costs from the literature on testing and treatment of early maternal HIV infection and lifetime treatment of infants born to infected mothers.

Outcomes assessed in the review
The main outcomes were prevalence and rate of HIV transmission, protection from transmission by zidovudine, and sensitivity and specificity of diagnostic tests (enzyme-linked immunosorbent assay repeated for positive results and confirmed by a Western blot).

Study designs and other criteria for inclusion in the review
The published literature and a public database were used. The inclusion/exclusion criteria were not 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
Not stated.

Number of primary studies included
Three studies were included for the estimated base case prevalence, another three studies were considered for the probability of HIV transmission, and one study each was used for the estimate of protection from transmission (efficacy) by zidovudine, and sensitivity and specificity of HIV testing.

Methods of combining primary studies
Primary studies were not combined. The author assumed the base case values for those parameters which were associated with more than one included study.

Investigation of differences between primary studies
Prevalence studies were reported to relate to a nation-wide serologic survey in 1991 (base case value), whilst the other two studies were reported as being associated with local rates and some estimates of rates at inner city hospitals. As for the transmission rate studies, one of the studies was stated to report estimates from discrete groups of women from Zaire “with specific risk factors” (values above the upper end of the range used in the analysis).

Results of the review
The prevalence of HIV was within a range from 0.00075 to 0.015, with a base case value of 0.0015. The rate of HIV transmission ranged from 0.1 to 0.6 and had a base case value of 0.255. The efficacy of zidovudine ranged from 0.05 to 1.0, and had a base case value of 0.66. The sensitivity and specificity rates used in the model were, respectively, 0.99 and 0.999 (no range used).

Measure of benefits used in the economic analysis
The measure of benefits was the number of additional cases of neonatal HIV prevented. These estimates were derived using a model.

Direct costs
Costs attributable to initiating antenatal screening were included. Specifically, the cost of an HIV test, the cost of zidovudine, the cost of neonatal-pediatric HIV and lifetime treatment, and the cost of early HIV detection were considered in the analysis. Quantities of resource use were not analysed separately from the costs. Costs were not discounted. Charges were used as proxies of costs for the zidovudine and HIV culture use. The quantity/costs boundary adopted was the hospital and the patient. The data were taken from sources dated 1988-1994. When necessary, costs were reflated to 1993 prices using the medical care component of the Consumer Price Index. Total costs were calculated using a model. The authors reported that costs of late maternal infection and acquired immunodeficiency syndrome were excluded, as it was assumed that clinical symptoms or indications would eventually lead such women to seek testing outside pregnancy.
Currency
US dollars ($).

Sensitivity analysis
The influence on the results of cost variables were studied by sensitivity analysis as well as baseline probabilities using one-way simple and threshold sensitivity analyses.

Estimated benefits used in the economic analysis
One additional case of neonatal HIV per 4,000 women tested was estimated to be prevented relative to no testing.

Cost results
The testing cost per patient was $97, whereas the no testing option had a corresponding figure of $47.

Synthesis of costs and benefits
The additional cost per case prevented by testing relative to the no-testing option was $198,509 at 1993 prices with no discount rate being reported. Dominance of the intervention was achieved above a prevalence HIV value of 0.009. The costs (charge) for a negative testing sequence had the greatest impact on the above results.

Authors' conclusions
Above a prevalence of HIV of 0.009, testing is both cheaper and more effective than not testing.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparator used.

Validity of estimate of measure of benefit
Adequate details about the methodology used in the literature search and review were not given.

Validity of estimate of costs
Quantities of resource use were not reported separately from the costs and no mention of discounting was made, even though the time horizon covered by the costing was beyond one year.

Other issues
Appropriate comparisons were made with other studies. The issue of generalisability to other countries was addressed.

Implications of the study
Further information on the methodology underlying the effectiveness and cost estimates is needed before any assessment of validity can be made and the relevance of the corresponding estimates to other setting be well understood.

Source of funding
None stated.

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