Rapid testing and zidovudine treatment to prevent vertical transmission of human immunodeficiency virus in unregistered parturients: a cost-effectiveness analysis

Stringer J S, Rouse D J

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
Rapid testing and zidovudine treatment to prevent vertical transmission of human immunodeficiency virus (HIV).

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Hypothetical cohort of 100,000 parturients without prenatal care.

Setting
Hospital. This study was carried out in Birmingham, Alabama, USA.

Dates to which data relate
Effectiveness data were collected from studies previously published between 1988 and 1998, and from local sources. Resource use and cost data were collected from studies previously published between 1988 and 1998. The price year was 1998.

Source of effectiveness data
Effectiveness data were derived from a literature review.

Modelling
A decision analytic model was used to calculate the cost-effectiveness of the three management strategies.

Outcomes assessed in the review
The review assessed the following outcomes: HIV prevalence, rate of vertical transmission, efficacy of zidovudine treatment, efficacy of postpartum syrup, rapid-test sensitivity and specificity.

Study designs and other criteria for inclusion in the review
Not stated.
Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
The quality of the model estimates was graded according to methods adapted from the US Preventive Services Task Force.

Methods used to judge relevance and validity, and for extracting data
Summary statistics from studies.

Number of primary studies included
Approximately 14 studies were included.

Methods of combining primary studies
Narrative method.

Investigation of differences between primary studies
Not stated.

Results of the review
The HIV prevalence and rate of vertical transmission in unregistered parturients was 0.05 and 0.255, respectively. The efficacy of intrapartum and postpartum zidovudine treatment was 0.18 and of postpartum syrup only was 0.09. The rapid-test sensitivity and specificity was 1 (95% CI: 0.921 - 1) and 0.991 (95% CI: 0.982 - 0.996), respectively. The reduction in vertical transmission in the rapid-test arm was 14.4% and in the treat-all arm was 18%.

Measure of benefits used in the economic analysis
The measure of benefits used was the number of cases of infant HIV prevented.

Direct costs
Costs were discounted at an annual discount rate of 5%. Quantities and costs were reported separately. Direct costs included programmatic costs of strategy (pharmacy costs, laboratory costs) and lifetime treatment costs of pediatric HIV infection. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on actual data. Pharmacy costs were calculated using published, average wholesale drug costs and local pharmacist charges. Laboratory cost estimates were provided by the University of Alabama Hospital Laboratory. Yearly inflation factors were derived from the medical consumer price index. The price year was 1998.

Statistical analysis of costs
Not reported.

Indirect Costs
Not included.

Currency
US dollars ($).
Sensitivity analysis
A one-way sensitivity analysis was performed on HIV prevalence, treatment efficacy, lifetime cost of pediatric HIV infection, pharmacy costs, costs of all test assays and rapid-test sensitivity and specificity. A multi-way sensitivity analysis was performed on treatment efficacy, lifetime cost of HIV infection and HIV prevalence.

Estimated benefits used in the economic analysis
The treat-none strategy resulted in 1,275 infected infants. The rapid-test strategy and the treat-all strategy prevented 183 and 229 cases of infant HIV infection, respectively.

Cost results
The rapid-test strategy resulted in a saving to the medical system of $10,613,461. The direct costs of the treat-all strategy amounted to $5,121,665.

Synthesis of costs and benefits
The incremental cost-effectiveness of the treat-all strategy compared with the rapid-test strategy was $342,068 per additional case averted. These results were insensitive to pharmaceutical costs, testing-reagent costs, and rapid-assay performance, but were sensitive to HIV prevalence.

Authors’ conclusions
This analysis suggests that rapid HIV testing of unregistered obstetric patients followed by zidovudine treatment for those who are seropositive would both reduce the number of cases of perinatal HIV transmission and be cost saving to the medical system, even if the proposed partial zidovudine regimen has only a small fraction of the full efficacy suggested by the AIDS Clinical Trial Group Protocol 076.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparators was clear. You, as a user of this database, should verify whether these health technologies are relevant to your settings.

Validity of estimate of measure of benefit
The relevant measure of benefit was used. Given the uncertainty surrounding many effectiveness estimates, an extensive sensitivity analysis was carried out. The effectiveness results do not appear to have been presented selectively.

Validity of estimate of costs
Only direct costs were included. Productivity losses or gains, life years lost or gained, or future costs to the medical system unrelated to HIV were not considered. Charges as opposed to costs were used and charges do not represent true opportunity costs. Related costs associated with the early diagnosis of maternal HIV disease were excluded. One cost estimate that drives the strategies’ cost-effectiveness, the lifetime cost of pediatric HIV infection, is likely to increase in the future given the rapidly changing environment of HIV therapeutics.

Other issues
The generalisability of the results to other settings or countries was not discussed. No comparisons with other relevant studies was made.

Implications of the study
Future research is needed in terms of the cost-effectiveness of these three management strategies and the level of
disease prevalence.

Source of funding
None stated.

Bibliographic details

PubMedID
10389714

Original Paper URL

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Anti-HIV Agents /economics /therapeutic use; Cost-Benefit Analysis; Female; HIV Infections /economics /prevention & control; Humans; Infectious Disease Transmission, Vertical /economics /prevention & control; Models, Economic; Pregnancy; Sensitivity and Specificity; Time Factors; Zidovudine /economics /therapeutic use

AccessionNumber
21999001242

Date bibliographic record published
30/04/2000

Date abstract record published
30/04/2000