An economic evaluation of screening for Chlamydia trachomatis in adolescent males

Genc M, Runsvaara L, Mardh P A

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 for chlamydia trachomatis with a leukocyte esterase (LE) dipstick and enzyme immunoassay (EIA) on urine samples.

Type of intervention
Screening, treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Adolescent males aged 15-19, military recruits or those at schooliversity, theoretical cohort of 1000.

Setting
Primary care routine health check centre. The economic study was carried out in Sweden.

Dates to which data relate
The effectiveness analysis was from studies from 1987-1992. Resource and price dates were not given.

Source of effectiveness data
Effectiveness data was derived from previously completed studies.

Modelling
A decision tree was used to estimate costs and benefits.

Outcomes assessed in the review
The main outcomes were sensitivity and specificity rates, compliance rates and prevalence rates among contacts of infected males.

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
Not stated.

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

Number of primary studies included
8 for screening, 2 for antibiotics, 3 for prevalence and follow up.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not done.

Results of the review
The sensitivity of both the EIA and the LE tests was in the range of 70%-80%. A specificity ranging from 75% -85% was assigned to the LE test. The corresponding range for EIA was 95%-99%. Looked at 50%-100% compliance with doxycycline. 97%-100% of men with uncomplicated genital infection are cured by the antibiotics. Of all men with an untreated chlamydial infection, 5%-10% are predicted to be cured spontaneously. Prevalence among contacts of infected males was predicted to range between 40%-60%.

Measure of benefits used in the economic analysis
Chlamydia trachomatis cure rates were estimated using a decision tree.

Direct costs
Costs and quantities were reported separately. Costs were discounted. Costs of the tests, confirmation, information, medical care and untreated infection in both sexes were considered. The cost boundary was the health service. The estimation of the quantities was derived using a decision tree. The source of cost estimation was a survey for EIA tests (including storage and transport costs). Other costs were estimated on the basis of published information/standard prices. All costs were given in ranges, extended in either direction by 20%. Price date was not given.

Indirect Costs
Costs and quantities were reported separately. Costs were discounted. Indirect costs related to patient costs of lost wages and lost value of household management. The estimation of quantities was derived using the decision tree, and based on information obtained from the literature and medical records. Cost data was obtained from the Swedish Statistics Bureau. The indirect cost boundary was the patient. No dates were given.

Currency
Currency was US dollars. Conversion from 1 Swedish Krona was approximately $7 (US).

Sensitivity analysis
Sensitivity in various key parameters was examined. The methods used were not specified.
Estimated benefits used in the economic analysis
Outcomes were expressed as 95% confidence intervals. Screening with LE-EIA achieved a cure rate of 40.7% to 41.5% overall (males and partners), as opposed to a spontaneous cure rate of 7.4% to 7.6% for all categories as a result of no screening. Overall, the incremental cure rate of EIA screening compared to LE-EIA was 12.2 - 12.6% (p<0.001). LE-EIA caused significantly less unnecessary treatment than EIA screening.

Cost results
Costs were discounted at a rate of 5% to 10% per year over a period of 5 to 10 years. The total cost for tests included the cost of a sample collection. LE test was $5-$7, EIA test $10-$17 and EIA following LE $7-$13. EIA confirmation cost was $11-$18, medical care for a male was $114-$160, medical care for a female was $151-$248. Untreated chlamydial infection in a male cost $135-$329, untreated chlamydial infection in a female partners cost $251-$1,489. Both the LE-EIA and EIA screening strategies reduced the overall costs significantly in comparison with no screening when the prevalence of infection in males exceeded 2% and 10% respectively.

Synthesis of costs and benefits
Synthesis was expressed as cost per cured male. When the prevalence of infection exceeded 2%, LE-EIA screening was significantly more cost effective than no screening at all. Incremental costs per cured male of switching from LE-EIA to EIA screening was $2,144 at its lowest, i.e. when the prevalence of infection in males was 100%. Confirmation of positive EIA results improved the cost effectiveness of the EIA screening when the prevalence of infection in males was less than 54%.

Nevertheless, the incremental cost of switching from LE-EIA screening to EIA combined with confirmation was $2,202 per cured male at its lowest, i.e, when the prevalence of infection in males was 100%.

Compared to a 7 day course of doxycycline, a single oral dose of azithromycin administered under supervision improved the cure rates of both EIA and LE-EIA screening strategies by 15.1-16.3% and 11.2-12.0% respectively, while reducing overall costs by 5 and 9% respectively, regardless of the prevalence among males.

Authors' conclusions
The use of LE-EIA screening combined with treatment of positive cases with azithromycin was the most cost-effective intervention strategy focusing on asymptomatic male carriers of Chlamydia trachomatis. This assertion was based on the fact that the incremental cost-effectiveness ratio of screening for asymptomatic infection in females as reported in the literature never exceeds the incremental cost-effectiveness ratio of switching from LE-EIA to EIA screening. Positive EIA results should be confirmed when screening low risk populations.

CRD Commentary
This study provided a detailed analysis in which opportunity costs were addressed. However:

a) This study did not justify why the primary studies were chosen, but dealt with ranges of estimates.

b) Internal and external validity were dependant on the quality of the effectiveness information which were collected from individual studies, not combined.

c) The analysis suffered from not giving any dates.

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