Screening for Chlamydia trachomatis in asymptomatic women in Hungary: an epidemiological and cost-effectiveness analysis


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
The use of different screening strategies for Chlamydia trachomatis (C. trachomatis) in asymptomatic women in Hungary.

Type of intervention
Screening.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised women of reproductive age who were registered with a hospital. All of the women were asymptomatic in terms of genital infection. The cost-effectiveness analysis was carried out on women aged from 15 to 19 years.

Setting
The setting was a hospital. The economic analysis was carried out in Hungary.

Dates to which data relate
The data on the prevalence and risk factors for C. trachomatis were collected during 1995. Additional effectiveness and resource use estimates were taken from studies published between 1985 and 1999. The dates to which the cost data relate were not reported. The price year was not reported.

Source of effectiveness data
The effectiveness estimates were derived from a single study, and a review and synthesis of completed studies.

Study sample
The sample consisted of 1,264 asymptomatic women. A sample of 1,288 women was needed, assuming a 5% significance, a power of 90% and a 5% estimated probability of infection. Seven per cent of the women were aged between 15 and 19 years. The sample was selected using simple random sampling.

Study design
This was a case series carried out at five different centres in Hungary. The patients were not followed-up beyond their initial diagnosis.
Analysis of effectiveness
The primary health outcomes used in the analysis were the prevalence and risk factors for C. trachomatis infection.

Effectiveness results
The prevalence of C. trachomatis infection was 4.5% (range by region: 1.5 - 6.8), or 5.1% (range by age: 0 - 16.9) when applying Bayes' theorem. Younger women, single or divorced women, and women living in Eastern or Middle Hungary, were more likely to be infected.

Clinical conclusions
The prevalence of C. trachomatis infection was 4.5% (range: 1.5 - 6.8), or 5.1% (range: 0 - 16.9) when applying Bayes' theorem. The risk factors for C. trachomatis infection were age, family status, and region.

Modelling
Bayes' theorem was used to assess the prevalence of C. trachomatis infection. A multiple logistic regression analysis was performed to identify the risk factors for C. trachomatis infection. A decision analysis was used to assess the potential outcome of C. trachomatis infection.

Outcomes assessed in the review
The review assessed the sensitivity and specificity of screening tests, the incidence of complications, and the birth rate.

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
Not stated.

Number of primary studies included
At least ten primary studies were included in the review.

Methods of combining primary studies
The primary studies were combined in the narrative.

Investigation of differences between primary studies
Not stated.

Results of the review
The sensitivity of the ELISA was 70% and the specificity was 99%.
The sensitivity of the amplified Gen-Probe method was 92% and the specificity was 99%.

Women with untreated Chlamydia infection had a 20% risk of pelvic inflammatory disease (PID).

Ten per cent of women with PID then developed an ectopic pregnancy.

Tubal infertility occurred in 20% of women with PID.

Each infected woman had one infected partner.

Forty per cent of men had urethritis.

Congenital pneumonia was identified in 7.1% of new-borns of infected women.

Three and a half per cent of women and men had severe nausea and vomiting from doxycycline and would not be cured.

The birth rate was 5% per year.

**Measure of benefits used in the economic analysis**

The measure of health benefits was the utility scores. A value of 0 indicated the presence of uncured C. trachomatis, whilst a value of 1 indicated the absence of C. trachomatis. Values were obtained from the original sample of 1,264 asymptomatic Hungarian women. The instrument used to derive the utility scores was not reported. An additional measure of benefit was the number of C. trachomatis infections undetected.

**Direct costs**

The direct costs were not discounted due to the short time horizon of the study (less than one year). The quantities and the costs were not reported separately. The direct costs were those related to screening, treatment, complications, and the treatment of one male partner. The quantity/cost boundary adopted was that of the hospital. The price year was not reported. The costs were estimated using local charges. Ten per cent of women with PID and 8% of men with urethritis needed hospitalisation. Seventeen per cent of C. trachomatis-positive new-borns were treated in neonatal intensive care units.

**Statistical analysis of costs**

No statistical analysis of the costs was reported.

**Indirect Costs**

The indirect costs were not included.

**Currency**

US dollars ($). The conversion rate was $1 = 243.4 Hungarian forints.

**Sensitivity analysis**

One-way sensitivity analyses were conducted on all model parameters.

**Estimated benefits used in the economic analysis**

When the infection rate was 12.6%, the number of cases of C. trachomatis undetected was 50,400 without screening, 16,355 with the ELISA, and 5,655 with the amplified Gen-Probe method.

When the infection rate was 12.6%, the utility score was 0.874 without screening, 0.981 with the ELISA, and 0.999
with the amplified Gen-Probe method.

When the infection rate was 16.9%, the utility score was 0.831 without screening, 0.957 with the ELISA, and 0.995 with the amplified Gen-Probe method.

**Cost results**

When the infection rate was 12.6%, the total costs (in millions) were $7.68 without screening, $7.01 with the ELISA, and $9.37 with the amplified Gen-Probe method.

When the infection rate was 16.9%, the total costs (in millions) were $10.30 without screening, $8.39 with the ELISA, and $9.64 with the amplified Gen-Probe method.

**Synthesis of costs and benefits**

When the infection rate was 12.6%, screening with the ELISA was more cost-effective than no screening. This resulted in a saving of $20 per case prevented.

Compared with no screening, screening with the amplified Gen-Probe involved an extra cost of $221 per case prevented.

When the infection rate was 12.6%, the average cost-effectiveness was $8.78 without screening, $7.29 with the ELISA, and $9.37 with the amplified Gen-Probe method.

When the infection rate was 16.9%, the average cost-effectiveness was $12.39 without screening, $8.76 with the ELISA, and $9.69 with the amplified Gen-Probe method.

Screening with the amplified Gen-Probe assay was the most cost-effective strategy when:

- the cost of the test was less than $9.7;
- the prevalence of infection was greater than 16.7%;
- the rate of PID exceeded 24%; or
- the probability of tubal infertility exceeded 25%.

**Authors' conclusions**

The amplified Gen-Probe assay was the preferred screening strategy for young women in Hungary.

**CRD COMMENTARY - Selection of comparators**

The justification for the comparators adopted was that they represented an alternative treatment strategy or no screening. You, should decide if these health technologies are relevant to your setting.

**Validity of estimate of measure of effectiveness**

The first part of the analysis used a prospective case series, which was appropriate for determining the prevalence and risk factors for C. trachomatis infection. Moreover, the authors reported some demographic characteristics of the sample. However, the authors did not state that a systematic review of the literature had been undertaken to derive effectiveness estimates for the decision analysis. More details about the sources searched, the search strategies employed, and the method of combining the primary effectiveness estimates could, therefore, have been provided.

**Validity of estimate of measure of benefit**
The estimation of benefits (utility scores) was modelled. A value of 0 indicated the presence of uncured C. trachomatis, whilst a value of 1 indicated the absence of C. trachomatis. This specific definition of utility scores made it difficult to compare the results with those from other studies, in which the utility scores were defined in terms of the best and worst health states. Values were obtained from the original sample of 1,264 asymptomatic Hungarian women. The instrument used to derive the utility scores was not reported. The results could have been compared with those from studies reporting on similar health technologies had the main outcome measure been the quality of life.

**Validity of estimate of costs**
Good features of the cost analysis were that all the relevant direct cost categories were included. In addition, sensitivity analyses were performed on the costs. However, the quantities and the costs were not reported separately and the price year was not reported. Moreover, the cost estimates were derived from local sources and are probably not generalisable to other settings. The costs reflected charges and, thus, a breakdown into the resource quantities and unit costs was not possible. This limited the generalisability of the cost findings.

**Other issues**
The authors did not make appropriate comparisons of their findings with those from other studies. They also did not address the issue of the generalisability of the results to other settings. The authors do not seem to have presented their results selectively. The study considered asymptomatic women under the age of 20 and this was reflected in the authors' conclusions.

**Implications of the study**
The amplified Gen-Probe assay is the preferred screening strategy for young women in Hungary.

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