The cost effectiveness of screening for genital Chlamydia trachomatis infection in Australia

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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
The study evaluated a hypothetical screening programme for Chlamydia trachomatis infection (CTI). The screening programme, which was compared with no screening, was based on annual opportunistic testing of all women aged 25 years or younger who were consulting a general practitioner (GP).

Type of intervention
Screening.

Economic study type
Cost-utility analysis.

Study population
The study population comprised a hypothetical cohort of asymptomatic women aged between 16 and 25 years who consulted a GP. The cohort presented an average prevalence and incidence of CTI for this age group.

Setting
The setting was primary care. The economic study was conducted in Australia.

Dates to which data relate
The effectiveness data used in the model came from studies published between 1992 and 2006. The price year was not stated.

Source of effectiveness data
The clinical data associated with the programme included:

- the annual prevalence and incidence of CTI in Australian women aged 16 to 25 years;
- the probability of being screened;
- the effectiveness of screening and treatment; and
- the annual probabilities of CTI complications.

Modelling
A Markov model was developed to assess the cost-effectiveness of the screening programme. The time horizon of the model was 25 years (i.e., on average, until age 45). The model simulated the screening, diagnosis and treatment of CTI complications, such as pelvic inflammatory disease (PID), infertility, ectopic pregnancy and chronic pelvic pain. One-year cycles were used. A half-cycle correction was applied. The health states and transition probabilities were reported.
Sources searched to identify primary studies
The authors stated that estimates for the model parameters were based on the highest level of evidence, with preference being given to data from meta-analyses and systematic reviews. In addition, expert opinion was used if no data were available. The data on long-term complications were reported to have been derived from observational studies and reviews of observational studies.

Methods used to judge relevance and validity, and for extracting data
The process by which the data were identified was not reported. It was unclear whether a systematic review of the literature was conducted, as there was no report or discussion of the sources searched, inclusion criteria or method of parameter selection.

Measure of benefits used in the economic analysis
The measure of benefits used was the quality-adjusted life-years (QALYs). The utility values for each health state were obtained from a US study, which used the Health Utilities Index to derive quality weights for different health states. It was assumed that screening and receiving treatment for CTI did no lead to any reduction in quality of life. For women with infertility, only women who wished to become pregnant and who underwent in vitro fertilisation treatment were assumed to have a decrease in utility. A discount rate of 5% was applied to the health benefits.

Direct costs
Costs to the Australian health care system were considered in the analysis. These included the costs of screening and the cost of treatment for CTI and its long-term complications. The resource use data were obtained from published studies and expert opinion, while the unit costs were taken from national official sources. The costs and the resources were reported separately. The price year was not reported. The costs were discounted at a rate of 5%.

Statistical analysis of costs
No statistical analyses were conducted on the costs or quantities.

Indirect Costs
Inline with the perspective adopted, productivity costs were not considered in the economic evaluation.

Currency
Australian dollars (AUD).

Sensitivity analysis
Deterministic one-way sensitivity analyses were conducted on all model variables using the range of plausible values identified in the literature. Multi-way sensitivity analyses were also conducted for the most relevant variables.

Estimated benefits used in the economic analysis
Over the 25-year time horizon of the model, the mean discounted QALYs per person were 14.388 in the screening group and 14.375 in the no-screening group.

The incremental discounted QALY per woman in the screening group was 0.0132. This difference in quality of life can be explained by the cumulative incidence of clinical and sub-clinical PID, which was lower in the screening group than in the no-screening group (7.9% versus 8.1%).
A modest benefit of the screening programme was also estimated in terms of the long-term complications (infertility, ectopic pregnancy and chronic pelvic pain), with a combined cumulative incidence of 2.1% in the screening group versus 2.4% in the no-screening group.

Cost results
Over the 25-year time horizon of the model, the estimated discounted cost was AUD 257.11 per woman in the screening group and AUD 217.84 in the no-screening group.

Synthesis of costs and benefits
The incremental cost per woman screened was AUD 39.27.

The incremental cost of screening over 25 years was AUD 2,968 per QALY.

The results of the one-way sensitivity analysis showed that the incremental cost-effectiveness ratio was sensitive to variation when low values were assumed for incidence and probability and utility of chronic pelvic pain. The rest of the variables tested in the sensitivity analyses had little impact on the results. When a multi-way sensitivity analysis was conducted, the results were highly sensitive to variations in long-term complication probabilities, and prevalence and incidence estimates. The authors suggested that these represent the most sensitive variables in the model.

Authors’ conclusions
Annual opportunistic screening for Chlamydia trachomatis infection (CTI) in women aged younger than 25 years was a cost-effective strategy, as its incremental cost-effectiveness ratio fell well within the range usually acceptable to funders in Australia. Further clinical studies are necessary to decrease the uncertainties surrounding the natural history of CTI and the effectiveness of CTI screening.

CRD COMMENTARY - Selection of comparators
No screening was chosen as comparator as it represented the current practice in the authors’ setting at the time of the study. Moreover, this allowed the active value of screening to be evaluated. You should decide if this is a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The probabilities for the model were mainly derived from published studies. However, the authors did not state whether a systematic search was conducted. No details of the search methods, inclusion criteria or data selection were given. The authors stated that they used the highest level of evidence available, but more explicit reporting of the methods would have enabled a better conclusion on the validity of the estimates to be drawn. Nevertheless, all model parameters were tested in the sensitivity analysis, which helps to enhance the internal validity of the results.

Validity of estimate of measure of benefit
The QALYs were used to estimate health benefits. The use of a general measure will permit comparisons with other studies. The utility values were obtained from a study conducted in the USA and were tested in both one-way and the multi-way sensitivity analyses. The health benefits were appropriately discounted.

Validity of estimate of costs
All the costs relevant to the perspective adopted were taken into consideration. The unit costs and the resource quantities were reported separately. The sources of the resource use and cost data were stated. The costs were appropriately discounted and the costs results were reported in detail. All costs were included in the sensitivity analysis, the results of which were reported in full.
Other issues
The authors made some comparisons of their results with those from other studies and reached similar conclusion. They also highlighted and discussed some limitations of their model. The lack of knowledge about the natural history of the condition would appear to be a major limitation and, as the authors suggested, requires further investigation.

Implications of the study
The study results suggested that annual opportunistic screening of women younger than 25 years for CTI could be a cost-effective strategy in Australia. However, the authors indicated that more clinical research is needed to assess the cost-effectiveness of a CTI screening programme with more accuracy.

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