Time from sexually transmitted infection acquisition to pelvic inflammatory disease development: influence on the cost-effectiveness of different screening intervals

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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.

CRD summary
The study assessed the cost-effectiveness of 6- or 12-month screening versus no screening for sexually transmitted infections (STIs) to prevent pelvic inflammatory disease (PID) in high-risk young women on the basis of the time from STI acquisition to PID development. The authors concluded that a 6-month combined chlamydia and gonorrhea screening strategy was cost-effective from the perspective of US society in high-risk women. The quality of the study methodology was good, but few details were provided on the source of the clinical data. Caution is therefore required when interpreting the study results.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective of the study was to determine the cost-effectiveness of 6- versus 12-month screening for sexually transmitted infections (STIs) to prevent pelvic inflammatory disease (PID) in high-risk young women (18 years old at start), varying assumptions on the time from STI acquisition to PID development.

Interventions
Two screening strategies were considered, 6- and 12-month screening. These were compared with a no screening option. Screening focused only on chlamydia and gonorrhoea.

Location/setting
USA/secondary care.

Methods
Analytical approach:
The economic evaluation was based on a Markov model that projected the natural history of PID for healthy women receiving their first screening at 18 years. The time horizon of the analysis was 4 years. The authors stated that a societal perspective was adopted.

Effectiveness data:
The authors did not describe a review of the literature, thus the primary studies might have been identified selectively. Disease progression was estimated from a prospective cohort study that followed young women for 4 years (the GYN Infection Follow-Through Study). Information on other sources was not given. In particular, no details were given on screening accuracy and adherence to the screening programme, which represent key clinical inputs. Some assumptions were also made.

Monetary benefit and utility valuations:
The utility values were derived from the literature, but no details of these studies were given.

Measure of benefit:
The summary benefit measure was the quality-adjusted life-years (QALYs). These were discounted at an annual rate of 3%. PID cases avoided, which represents a key output of the model, were also reported.
Cost data:
The categories of costs considered in the analysis were office visits, medications, and time lost for seeking or receiving care. The medical costs were derived from published studies, while the cost of time was based on hourly wage rates from the Bureau of Labor. Similarly, resource use was estimated on the basis of published evidence. Future costs were discounted at an annual rate of 3%. The price year was 2004 and the costs were in US dollars ($).

Analysis of uncertainty:
Univariate and multivariate sensitivity analyses were undertaken to identify the impact of variations in model inputs on the cost-effectiveness results. The authors might have defined the ranges of values used. Longer time horizons, as well as other possible PID risk distributions, were considered in alternative analyses.

Results
The incremental cost per QALY gained with 6-month screening compared with no screening was $31,800 when the mean time to PID was 1 month (0.014 QALYs gained for an additional cost of $444) and decreased to $16,600 when the mean time to PID was 12 months (0.022 QALYs gained for an additional cost of $370).

The strategy of 12-month screening showed much higher cost-effectiveness ratios in comparison with no screening, thus 6-month screening showed extended dominance over 12-month screening.

The sensitivity analysis showed that the base-case results were generally robust, although the cost-utility ratios were sensitive to variations in the time horizon, with better cost-utility ratios with longer time horizons and screening initiation in younger women (15 rather than 18 years). However, the infection rate represented a key model input. For women at low risk of infection (2.5% per year), the incremental cost per QALY for 6-month screening compared with no screening increased dramatically, ranging from $43,000 to $72,000 depending on the mean time to PID.

Authors’ conclusions
The authors concluded that time from initial infection to the development of PID was a relatively minor factor in determining the cost-effectiveness of a 6-month combined chlamydia and gonorrhea screening strategy in comparison with a 12-month strategy for high-risk women. The risk of infection was the most important model input.

CRD commentary
Interventions:
The selection of the comparators was appropriate and consistent with the objective of the analysis. The use of different assumptions for time from STI to PID was a key feature of the study. These screening strategies are also likely to be relevant in other settings.

Effectiveness/benefits:
The derivation of the clinical data was not described clearly. The primary studies might have been identified selectively, but the design of only one source of data was described. Thus, it is not possible to assess the validity and robustness of these inputs. The use of QALYs represents a strong characteristic of the analysis, although no details of the source of the utility values were provided.

Costs:
The analysis of the costs was consistent with a societal perspective. A partial breakdown of the cost items was provided, but there was little information on the sources used to derive the economic inputs. The price year and the discount rate were given. The cost estimates were treated deterministically as no statistical tests were conducted.

Analysis and results:
The results of the analysis were presented clearly. The issue of uncertainty was partially addressed in the deterministic sensitivity analysis. The generalisability of the study was not explicitly discussed. The authors noted some limitations of the analysis, such as the fact that the model was restricted to aetiologies such as gonorrhea and chlamydia, perhaps overestimating the effect of screening. Further, the possible harm arising from the more frequent screening was not considered. Finally, it was noted that a static cohort model was used whereas a dynamic population model would have been more appropriate.
Concluding remarks:
The quality of the study methodology was satisfactory, but few details were provided on the sources used to derive the clinical and economic inputs for the model. The authors’ conclusions were strengthened by the extensive use of sensitivity analysis.

Funding
NIAID grant number K23 AI056347.

Bibliographic details

PubMedID
17888100

DOI
10.1111/j.1524-4733.2007.00189.x

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Cost-Benefit Analysis; Female; Humans; Markov Chains; Mass Screening /economics /methods; Pelvic Inflammatory Disease /economics /etiology /prevention & control; Quality-Adjusted Life Years; Sexually Transmitted Diseases /complications /diagnosis /economics; Time Factors

AccessionNumber
22007002151

Date bibliographic record published
01/09/2008

Date abstract record published
30/09/2008