The cost effectiveness of azithromycin for Chlamydia trachomatis infections in women

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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
Azithromycin and doxycycline in the treatment of cervical chlamydia infections.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
A hypothetical cohort of 10,000 women with clinically suspected genital Chlamydia trachomatis and a cohort of 10,000 women with laboratory confirmed Chlamydia trachomatis. Pregnant women were excluded since azithromycin is not a recommended regimen for that patient group.

Setting
Out-patient clinic. The economic study was carried out in Georgia, USA.

Dates to which data relate
The dates for the resource use data and the effectiveness data were not reported. Costs were reported at the 1993 price level.

Source of effectiveness data
The estimate of effectiveness was based on a review of previously completed studies and opinion.

Modelling
A decision tree model was used to estimate expected outcomes and costs.

Outcomes assessed in the review
The following outcomes were assessed: the prevalence of chlamydia among clinically suspected patients, efficacy of the two treatments, and compliance rates for the multidose (doxycycline) therapy. The probability of pelvic inflammatory disease (PID) with and without therapy was also assessed. For the cost estimation the probabilities for hospitalization and outpatient treatment of acute PID cases and probabilities for chronic PID or chronic pelvic pain, ectopic pregnancy, and infertility as consequences of acute PID. Also the treatment rate for infertility was estimated.

Study designs and other criteria for inclusion in the review
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
Nine studies were included in the review, and the number of sources varied from one to four across different parameters used in the model.

Methods of combining primary studies
The results from primary studies were not combined. In the case where multiple estimates were available, the baseline value was selected by the authors.

Investigation of differences between primary studies
Differences between studies were not investigated.

Results of the review
Based on one published controlled trial, the efficacy of both drug therapies was determined be 0.965. In the cohort of presumptively treated women the prevalence of chlamydia infection was assumed to be 0.20, while the estimates in the literature ranged from 0.10 to 0.50. The compliance rate for multidose therapy was assumed to be 0.80 ranging from 0.50 to 0.80 in the literature. The risk of acute PID was found to be 0.20 and 0.06 for unsuccessfully and successfully treated women, respectively. Of acute PID cases, 0.14 were hospitalized and 0.86 received outpatient treatment. In the acute PID patients the probability of developing chronic pain, ectopic pregnancy, and infertility were 0.18, 0.06, and 0.20, respectively. Treatment rate for infertility was 0.25.

Methods used to derive estimates of effectiveness
Estimates of effectiveness were also derived from the authors' assumption and the opinion of experts.

Estimates of effectiveness and key assumptions
The authors assumed that the compliance rate for the single dose therapy was 100%. The authors reported that the risks of scarring sequelae were partly obtained through expert opinion, but did not specify the methods used or which estimates were produced in this process.

Measure of benefits used in the economic analysis
The measure of effectiveness used in the economic analysis was the number of cases of pelvic inflammatory disease (PID) prevented. The quality of life associated with the outcome was not assessed.

Direct costs
Direct costs included costs of drug treatment, and costs of treating cases of PID and its sequelae. Future treatment costs were discounted at an annual rate of 5%. Resource use quantities were not reported separately from costs. The costs of initial drug therapy included only the cost of drugs, and the cost of clinician time and diagnostic tests were assumed to be identical and hence were excluded from the analysis. The price for the study medication was obtained from interviews with two retail pharmaceutical chains and administrators of multiple publicly funded clinics. The cost boundary of the health care system was adopted in the study, but also a more limited perspective of a publicly funded clinic was used.

**Currency**
US dollars ($).

**Sensitivity analysis**
A sensitivity analysis was carried out in order to address the uncertainty in the data and the differences in clinic setting and population. A one-way simple sensitivity analysis was performed on prevalence of chlamydia trachomatis in presumptively treated population, doxycycline compliance rate, the cost of treating PID and its sequelae, probability of PID among both compliers and non-compliers, and the risk of PID sequelae.

**Estimated benefits used in the economic analysis**
In the cohort of 10,000 women with laboratory confirmed chlamydia infection, 270 incremental cases of PID could be prevented by treating with azithromycin rather than doxycycline. In the cohort of 10,000 presumptively treated women, azithromycin would prevent 54 additional cases of PID. Benefits were not discounted since acute PID was assumed to occur within 12 months from diagnosed chlamydia infection.

**Cost results**
From the perspective of the health care system, the additional costs of treating 10,000 patients with azithromycin was estimated to be $290,000, and the savings due to avoided future treatments were $1.2 million in the laboratory confirmed group and $247,000 in the presumptively treated group. Using the public health clinic perspective the additional treatment costs associated with azithromycin for both cohorts was estimated to be $220,000 with future savings of $29,000 in the lab-confirmed cohort and $5,670 in the presumptively treated cohort.

**Synthesis of costs and benefits**
In the lab-confirmed group the treatment with azithromycin appeared to be a cost saving alternative from the perspective of the health care system, while the incremental cost-effectiveness ratio, using the publicly funded clinic's perspective, was $709 per additional case of PID prevented. For the presumptive-treatment cohort the incremental cost-effectiveness ratios were $792 and $3,969 for the entire health care system and the publicly funded clinic, respectively. The sensitivity analysis demonstrated that the presumptive-treatment strategy was sensitive to the model assumption, especially to the rate of compliance and the prevalence of chlamydia. From the health care system's point of view the presumptive treatment becomes cost saving if the price of azithromycin decreases by 10%.

**Authors' conclusions**
For the health care system, azithromycin is a cost-effective alternative to doxycycline. However, the cost of azithromycin must decrease markedly for it to be less costly to a publicly funded clinic.

**CRD COMMENTARY - Selection of comparators**
A justification was given for the comparator used. A multidose therapy with doxycycline is a recommended regimen for treating cervical chlamydia infections and is a cheaper alternative to single dose therapy with azithromycin. You, as a user of this database, should consider whether this is a widely used technology in your own setting.
Validity of estimate of measure of benefit

The estimated benefits were obtained from a decision tree model in which the values of parameters were based on various sources the quality of which was not assessed in the study. Also, it is not clear to what extent the parameter values used were based on experts’ opinions, which are more likely to be biased than estimates based on good quality trials. This problem was, however, addressed in the sensitivity analysis. The data were not used selectively.

Validity of estimate of costs

The resource use quantities were not reported separately from the costs, although, as the medication cost was only item in the intervention costs, the quantities could be derived from the assumed dosage for the alternatives. Costs of diagnostic tests and clinician working time were excluded on the grounds that they were identical in both alternatives.

Other issues

The authors’ conclusions seem to be justified. The uncertainty related to source of data from where the values of key parameters in the model were obtained was satisfactorily addressed in the sensitivity analysis. Even though the effect of changing cost conditions was investigated in the sensitivity analysis, the results, which were specific to the US health care system, may not be directly generalised to settings in other countries. It should be noted that this study was not designed to provide evidence about relative costs and effects of different diagnostic strategies (laboratory-confirmed versus presumptive-treatment), and hence the relevance of the results for decision making must be strictly limited to the comparison of the two treatment regimens.

Source of funding

None stated.

Bibliographic details


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Other publications of related interest


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