Cost effectiveness of a point-of-care test for adenoviral conjunctivitis

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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
This study examined the cost-effectiveness of a rapid test, at initial consultation, for the diagnosis of adenoviral conjunctivitis compared with no test. The authors concluded that the rapid test was a cost-effective strategy, which saved societal costs and reduced unnecessary antibiotic treatment. The study appears to have been based on valid methodology, but the poor reporting of the data sources does not permit an objective assessment of the validity of the results and the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to examine the cost-effectiveness of a test, with immediate results, for the diagnosis of adenoviral conjunctivitis compared with no test, in the whole population.

Interventions
A diagnostic strategy based on a rapid test at the initial consultation was compared with an alternative strategy without this test.

Location/setting
USA/primary care.

Methods
Analytical approach:
The analysis was based on a decision model that compared the costs and effects of the two options. The time horizon was not explicitly reported. The authors stated that a societal perspective was adopted.

Effectiveness data:
The clinical data came from multiple sources, which included primary databases, published literature, and expert opinions. These sources appear to have been selected and were generally not described. It was only stated that the data on the contagion of adenoviral cases came from a single Asian country and the percentage of cases of adenoviral conjunctivitis came from studies conducted in the 1980s. The prevalence of conjunctivitis was the key clinical input.

Monetary benefit and utility valuations:
Not assessed.

Measure of benefit:
The benefit measure was the number of cases of unnecessary antibiotic treatment arising from the incorrect diagnosis of adenoviral conjunctivitis.

Cost data:
The economic analysis included the costs of the diagnostic tests, physician visits, antibiotic treatment, conservative therapy, antibiotic-related morbidity, lost productivity, adenoviral conjunctivitis morbidity, and steroid treatment. The sources of data were not explicitly reported. All costs were in US dollars ($) and the price year was 2006.

Analysis of uncertainty:
One-way sensitivity analyses were carried out on all the model inputs. The ranges of values were either based on published sources or were arbitrarily defined by the authors. The most influential model inputs were further tested in two-way and threshold analyses. A payer’s perspective (excluding productivity losses) was also considered. A micro-simulation based on 10,000 iterations of model inputs was also run.

**Results**

The cost per case of acute conjunctivitis per year would be $111.56 with no rapid test and $40.25 with the test. The cost of the test was more than offset by the reduction in costs of unnecessary antibiotic therapy. The rapid test would avoid 0.1786 cases of inappropriate antibiotic use compared with no test. The rapid test was dominant as it was less expensive and more effective than no test.

Considering the approximately six million cases of acute conjunctivitis per annum in the USA, the rapid test could save $429.4 million and avoid 1.1 million cases of inappropriate antibiotic use.

The sensitivity analysis showed that the percentage of cases of adenoviral conjunctivitis misdiagnosed accounted for almost 80% of the model uncertainty. The dominance of the rapid test persisted in all scenarios as well as in the micro-simulation.

**Authors' conclusions**

The authors concluded that the use of a rapid test for adenovirus, at the point of care, was a cost-effective strategy, which saved societal costs and reduced unnecessary antibiotic treatment in patients with conjunctivitis in comparison with no test.

**CRD commentary**

**Interventions:**

The selection of the comparators was appropriate as the proposed strategy was compared with the usual approach for this patient population.

**Effectiveness/benefits:**

The authors did not use a systematic approach to identify the relevant sources of data and a selective approach does not ensure the identification of the most relevant estimates. They did not provide any information on the design or methods of the published sources and they did not discuss issues related to the use of data from mixed sources. They acknowledged that the use a single Asian country might have been inappropriate for the estimation of one model input and that the other studies selected were quite old. Some expert opinions were used, which introduced further uncertainty into the model. The benefit measure was specific to the disease and the interventions under examination, which limits its ability to be compared with other measures for other diseases. It was also an intermediate outcome of the impact of the diagnostic test on patients’ health.

**Costs:**

The categories of costs were consistent with the perspective stated. The economic analysis was poorly reported in terms of the data sources and the types of items included, which limits its transparency. The costs were presented as macro-categories and limited information on resource quantities was provided. The use of both a societal and a third-party payer perspective was a strength of the analysis. The price year was reported.

**Analysis and results:**

The findings were clearly presented and the use of an incremental analysis was appropriate for synthesising the costs and benefits. The issue of uncertainty was satisfactorily investigated and was appropriately discussed, but the time horizon was not clearly stated. The authors acknowledged some limitations of their study, which mainly related to the sources for the clinical data, as described above.

**Concluding remarks:**

The study appears to have been based on valid methodology, but the poor reporting of the data sources does not permit an objective assessment of the validity of the results and the authors’ conclusions.
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