Cost-effectiveness of linezolid and vancomycin in the treatment of surgical site infections

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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 evaluated the cost-effectiveness of oral linezolid compared with vancomycin for treating surgical site infections caused by methicillin-resistant Staphylococcus aureus. The conclusion was that oral linezolid during hospitalisation and after discharge was the most cost-effective approach. Despite some limitations to the clinical data, the authors presented a reasonably transparent analysis and it is likely that the results reflected the available evidence. The conclusion reached by the authors appears to be appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The aim was to evaluate the cost-effectiveness of linezolid compared with vancomycin for treating surgical site infections caused by methicillin-resistant Staphylococcus aureus (MRSA).

Interventions
Three interventions were evaluated: intravenous vancomycin during hospitalisation and after discharge with home-care follow-up; intravenous vancomycin during hospitalisation and oral linezolid after discharge; and oral linezolid during hospitalisation and after discharge.

Location/setting
USA/tertiary-care academic medical centre.

Methods
Analytical approach:
A decision tree model was used for the economic evaluation. The perspective reported by the authors was that of a university teaching centre in the USA with a home health care division. The time horizon was short-term and equivalent to the time of the surgical site infection, which was about one month.

Effectiveness data:
The evidence came from the cure rates from a retrospective five-year chart review of 44 patients at the medical centre, for vancomycin, and from a published randomised trial, for linezolid. The search strategy was reported in detail. The authors' assumptions for each of the three interventions were clearly described.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
Infections cured was the main effectiveness and benefit measure.

Cost data:
The cost categories included those of hospitalisation at different levels of care including home-care, drug acquisition, and treatment failures, including assumed re-admission. The main source was the academic medical centre. No adverse event costs were included. The currency was US dollars ($) and the price year was 2006.

Analysis of uncertainty:
One-way sensitivity and threshold analyses were conducted for the key input parameters.

**Results**
The probability of cure was 0.867 with oral linezolid; 0.787 with intravenous vancomycin then oral linezolid; and 0.707 with intravenous vancomycin. The costs were $8,923 with oral linezolid; $11,479 with intravenous vancomycin then oral linezolid; and $12,481 with intravenous vancomycin. Oral linezolid dominated the alternatives, which means it was better and cheaper.

The sensitivity analysis showed that intravenous vancomycin then oral linezolid was more cost-effective only when the hospital length of stay was less than six days, or when the probability of cure in the oral linezolid intervention was less than 0.72.

**Authors’ conclusions**
The authors concluded that oral linezolid during hospitalisation and after discharge was the most cost-effective approach for treating surgical site infections caused by MRSA.

**CRD commentary**

**Interventions:**
The interventions were described in detail and they appeared to be relevant and were justified by the authors. It was not clear whether other potentially relevant interventions were omitted.

**Effectiveness/benefits:**
As the authors stated, a major limitation of their study was basing the linezolid effectiveness on a small, open-label, randomised trial. The vancomycin cure rates were also based on a retrospective chart review, which has known potential limitations.

**Costs:**
All those costs relevant to the stated perspective appear to have been included and the selected sources were adequately described. The resource use data and the costs were well reported and the costs appeared to be appropriate for the population and setting. The authors justified the exclusion of adverse event costs due to their low impact.

**Analysis and results:**
The model structure was presented in a diagram along with all the relevant details and modelling assumptions. The authors conducted an incremental analysis and the results were adequately presented. One-way and threshold sensitivity analyses were conducted on the modelling assumptions and parameters, enhancing the generalisability of the findings. A probabilistic sensitivity analysis would have been a more thorough way to assess the overall model uncertainty. The authors provided a thorough discussion on the limitations and weaknesses of their study.

**Concluding remarks:**
Despite some limitations to the clinical data, the authors presented a reasonably transparent analysis and it is likely that the results reflected the available evidence. The conclusions reached by the authors appear to be appropriate.

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**Bibliographic details**

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