Cost-effectiveness of linezolid versus vancomycin for hospitalized patients with complicated skin and soft-tissue infections in France

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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 objective was to compare the cost-effectiveness of linezolid versus vancomycin, as initial treatment for hospitalised patients with complicated skin and soft tissue infections, suspected or proven to be methicillin-resistant Staphylococcus aureus. The authors concluded that linezolid might be considered to be cost-effective in France. The methods were adequate, but a literature review was not described and there was a small difference in outcomes between the two interventions. The authors’ conclusions should have been more conservative.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to compare the cost-effectiveness of linezolid versus vancomycin, as the initial treatment for hospitalised patients with complicated skin and soft tissue infections, such as wound infection, cellulitis, abscesses, acutely infected ulcers, or infected burns of less than 20% of the body, due to suspected or proven methicillin-resistant Staphylococcus aureus (MRSA).

Interventions
Oral or intravenous linezolid 600mg was compared with intravenous vancomycin 1g. If first-line treatment failed, second-line treatments included linezolid, vancomycin, oxacillin, clindamycin, and linezolid or vancomycin with additional treatments.

Location/setting
France/in-patient secondary care.

Methods
Analytical approach:
A decision model was developed to estimate the costs and effects associated with each treatment. Those subtypes of infection with similar treatment costs were grouped into three categories, based on expert opinion: cellulitis and major skin abscesses; surgical site infections, infected traumatic wounds, and burns; and infected ulcers. The time horizon was until the successful conclusion of first- or second-line therapy, death, or the failure of second-line therapy. The authors reported that the perspective was that of the French health care system.

Effectiveness data:
The clinical and effectiveness data were from an unpublished clinical trial, published studies, and expert opinion. The main effectiveness estimates were the MRSA and oxacillin cure rates. The MRSA cure rates were derived by analysing data from an unpublished clinical trial conducted by Pfizer. The oxacillin cure rate was from a published study.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measure of benefit was the percentage of patients cured on both first- and second-line treatment.
Cost data:
The direct costs were those of hospitalisations, which included isolation, length of treatment, management of adverse events, concomitant medications, and tests, and follow-up visits after discharge. The resource use was estimated by a Delphi panel of five practicing physicians, who were experienced in treating skin and soft tissue infections. The unit costs were from French diagnosis-related group data, published studies, and the accounting departments of certain French hospitals. The costs were updated to 2006 prices and were reported in Euros (EUR).

Analysis of uncertainty:
One- and two-way sensitivity analyses were undertaken to evaluate the sensitivity of the model results to changes in the model inputs that were expected to have an impact on the overall results. A conservative scenario was analysed.

Results
The overall cure rate for patients initially treated with linezolid was 98.5% compared with 98.0% for those initially treated with vancomycin. The average cost per patient was EUR 7,778 for linezolid, compared with EUR 8,777 for vancomycin.

Linezolid was dominant, as it was more effective and less costly than vancomycin.

The results were most sensitive to changes in the general ward stay, the price of linezolid, and the resistance rate.

Authors’ conclusions
The authors concluded that linezolid might be considered cost-effective for patients with complicated skin and soft tissue infections that were suspected of being related to MRSA, in France.

CRD commentary
Interventions:
The interventions were reported clearly.

Effectiveness/benefits:
The authors did not report the methods used to identify the sources for the clinical and effectiveness data. One of the main effectiveness parameters was based on data from an unpublished trial, carried out by a pharmaceutical company. As a result, it is not clear if all the relevant information was included in the model.

Costs:
The perspective was reported clearly and it appears that all the main costs relevant to this health care system perspective were included. The methods used to derive the resource use from the Delphi panel were reported, as were the sources for the unit costs. The price year and currency were given.

Analysis and results:
The available cost and outcome data were synthesised, using a decision tree. Appropriate details of the model structure were reported, with a diagram. The uncertainty in the model's results was tested in a series of one- and two-way sensitivity analyses. These types of analysis go some way towards evaluating the impact of uncertainty, but probabilistic sensitivity analysis would have been a better way to assess the overall model uncertainty, especially given the small difference in outcomes between the two interventions. As limitation to their study, the authors reported that the unit costs were from a number of different sources.

Concluding remarks:
The methods were adequate, but a literature review was not reported and the analysis relied heavily on expert opinion and unpublished data. Given this high uncertainty and the small difference in outcomes between the two interventions, the authors’ conclusions should have been more conservative.

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