Costs and benefits of the MRSA Search and Destroy policy in a Dutch hospital

van Rijen MM, Kluytmans JA

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 examined the cost-effectiveness of a screening and treatment programme against methicillin-resistant Staphylococcus aureus (MRSA) in a large teaching hospital in a country with low MRSA prevalence. The authors concluded that the MRSA screening/treatment programme saved money and lives from the perspective of a hospital. The study relied on several assumptions and was not based on an explicit comparison between the programme and the control strategy so caution is required when interpreting the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study examined the cost-effectiveness of a screening and treatment programme against methicillin-resistant Staphylococcus aureus (MRSA) in a large teaching hospital in a country with low MRSA prevalence.

Interventions
The screening/treatment programme under examination was the active Search and Destroy policy, the main aspects of which were screening and isolation of patients considered at increased risk for carriage of MRSA, especially those who had been treated in a hospital abroad and those with exposure to pigs or veal calves. Isolation was performed in a room with an anteroom in which health care workers put on their personal protective equipment. Antibiotics were prescribed to MRSA carriers. The control strategy was no active surveillance.

Location/setting
The Netherlands/hospital.

Methods
Analytical approach:
Analysis was based on data from a single study with a short-term time horizon. The authors stated that the perspective adopted in the study was that of the hospital.

Effectiveness data:
It appeared that the clinical analysis was based on a case series as a single group of patients (those involved in the screening/treatment programme) was considered. The study was carried out at a single teaching hospital in The Netherlands over the period 2001 to 2006. Patients were followed until hospital discharge. Data were collected prospectively in a hospital database. Outcomes for patients in the control group were calculated on the assumption that in the absence of control measures 50% of the nosocomial S. aureus bacteraemias were caused by MRSA (and these were additive to the infections found in the study period) as in many countries that do not apply the control policy. Such an assumption was supported by published studies. The primary endpoint was the rate of MRSA.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
No summary benefit measure was used. The main outcomes were number of lives saved and cases of MRSA avoided.

Cost data:
The economic analysis considered the difference between costs for application of the programme and savings due to prevented MRSA bacteraemia. Variable and fixed costs were included. Variable costs included those for screening, isolation, contact tracing, treatment of carriers and closure of wards. Fixed costs included those for building isolation rooms and the salary of one full-time infection and control practitioner. Quantities of resources used and costs associated with the programme were taken directly from the hospital database. Unit costs and resource quantities were presented separately. Costs of MRSA bacteraemia were taken from a published study conducted in USA. Costs were in Euros (€).

Analysis of uncertainty:
Not considered.

Results
The annual cost of the programme was €215,559 and annual savings associated with prevented MRSA bacteraemia were €427,356. The programme saved €211,797 to the hospital.

Based on assumptions of nosocomial bacteraemia where no control measures were taken, the screening/treatment programme prevented 36 additional nosocomial bacteraemias and saved 10 additional lives (95% CI 8 to 14).

Authors' conclusions
The authors concluded that the MRSA screening/treatment programme saved money and lives from the perspective of a hospital.

CRD commentary
Interventions:
The comparators were appropriate as active surveillance/treatment was compared with no intervention. The latter strategy was hypothetical and both health and economic outcomes were based on assumptions rather than on actual data.

Effectiveness/benefits:
Clinical data for the programme of screening/treatment of MRSA were taken from a large sample of patients enrolled in a Dutch hospital and were collected prospectively. This should have ensured a valid estimate of cases of MRSA in the authors' setting. Estimates from the control group were based on an assumption that the increase in MRSA cases without a surveillance programme would be similar to that found in published studies of other countries with high MRSA prevalence. This assumption presented several issues. First, it was unclear whether the rate found in high-risk countries could be relevant to countries with low prevalence (such as the Netherlands). Second, the comparability of the patient population of this study with those in the published evidence was not discussed. Third, no attempt was made to take account of the variability around this parameter and no sensitivity analysis was conducted. The endpoints used in the analysis represented the natural outcomes of the surveillance programme but were intermediate measures of the impact of the interventions on patients' health.

Costs:
The economic analysis was carried out transparently. The perspective was that of the hospital and the types of costs included in the analysis and their sources were in line with this viewpoint. Information on unit costs and resource quantities was presented extensively and would enable replication of the economic analysis in other settings. All economic data relative to the screening/treatment programme were taken from the hospital accounting system and collected prospectively. These were representative of the authors' setting and were likely to have been collected in detail. Cost estimates for MRSA were taken from a published study that was not described and appeared to have been conducted in USA. Its applicability to the Dutch context was not discussed. Costs were treated deterministically. Statistical analyses were not performed. Exclusion of some cost categories was justified by the authors given the perspective of the analysis. The price year was not stated explicitly and reflation exercises in other time periods would not be possible although all economic estimates were for the period 2001 to 2006.

Analysis and results:
The expected costs and benefits of the programme were presented but were not combined as cost-effectiveness ratios because of the cost-consequences design of the analysis. The issue of uncertainty was not investigated and no sensitivity
analyses were performed. The authors stated that some assumptions made were conservative against the surveillance programme and they provided a justification for this. However, the main limitation of the study was related to the clinical assumption on treatment effect which was not based on actual data. The study results should be considered specific to the authors' setting and cannot be transferred to other jurisdictions.

Concluding remarks:
The study relied on several assumptions and was not based on an explicit comparison between the programme and the control strategy so caution is required when interpreting the authors’ conclusions.

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