Impact of rapid molecular screening for meticillin-resistant Staphylococcus aureus in surgical wards


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 examine the clinical and economic impact of a rapid molecular screening for hospital-acquired meticillin-resistant Staphylococcus aureus (MRSA) in surgical patients. The authors concluded that rapid MRSA screening of all surgical admissions led to a significant reduction in MRSA bacteraemia, which, in turn, led to savings in treatment costs, but also to an increase in screening costs. The study had some methodological limitations which might affect the validity of the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to examine the clinical and economic impact of a rapid molecular screening for hospital-acquired meticillin-resistant Staphylococcus aureus (MRSA) in surgical patients undergoing elective and emergency procedures.

Interventions
The rapid MRSA screening of all surgical admissions was compared with the screening strategy in place before the implementation of the new method. This previous strategy was a culture technique with a turnaround time of up to three days. MRSA carriers were administered topical suppression which was mupirocin nasal ointment three times a day plus undiluted chlorhexidine gluconate bodywash.

Location/setting
UK/hospital.

Methods
Analytical approach:
This economic evaluation was based on a single study. The time horizon of the analysis appears to have been one or two months after hospital discharge. The perspective was not explicitly reported.

Effectiveness data:
The clinical data were derived from a cohort study with historical control data. All the patients admitted in 2006 to a teaching hospital were given rapid MRSA screening. These patients were contacted, one to two months after hospital discharge, for a follow-up evaluation. The data for 2006 were compared with two periods in which the previous screening strategy was used. The two periods were 2000 to 2005 and 2005 only. The 2006 dataset included 18,810 screening samples. The key clinical outcome was the rate of MRSA blood infection (bacteraemia) and MRSA wound infection.

Monetary benefit and utility valuations:
None.

Measure of benefit:
A cost-consequences analysis was carried out. Thus, no summary benefit measure was used and nothing was combined with the costs. The primary clinical outcome was the reduction in the rate of MRSA wound infection and bacteraemia.
Cost data:
The economic analysis considered the costs of bacteraemia cases (or wound infections) in different hospital wards and the cost of screening (including reagents, equipment, and staffing). The cost-savings associated with fewer bacteraemia cases (or wound infections) were translated into the number of beds per year. The resource use was based on data derived from the clinical study. All costs were in UK pounds sterling (£) and a single price year was not reported.

Analysis of uncertainty:
Not performed.

Results
In comparison with the annual mean for the preceding six years, with the implementation of the rapid molecular screening, MRSA bacteraemia fell by 38.5% (p<0.001) and MRSA wound infections fell by 12.7% (p=0.021).

Compared with the year 2005 alone, MRSA bacteraemia fell by 38.6% (p<0.001) and MRSA wound infections fell by 27.9 % (p<0.001).

Compliance with the screening across surgical specialties improved during 2006.

In comparison with the annual mean for the preceding six years, the observed reduction in MRSA bacteraemia and wound infections was equivalent to a saving of 3.78 beds per year (£276,220). The annual cost of screening was £302,500, which corresponded to 4.1 beds per year. Thus, the programme led to a net loss of £26,280. However, compared with 2005 (the year with the highest incidence of MRSA bacteraemia and wound infection), there was a net saving of £545,486.

Authors' conclusions
The authors concluded that rapid MRSA screening of all surgical admissions led to a significant reduction in staphylococcal bacteraemia, which led to savings in treatment costs, but also to an increase in screening costs.

CRD commentary
Interventions:
The rationale for the selection of the comparator was clear in that the rapid screening approach was compared with the standard care before the introduction of the new screening strategy. The comparators were a six-year period and the year preceding the implementation of the rapid screening.

Effectiveness/benefits:
The use of a cohort study with historical control data represents a potentially weak source of clinical evidence, given the limitations of such a design. For example, study groups were not compared simultaneously. Given that different time periods were compared, the authors controlled for potential changes in hospital policies for patient management (hand hygiene and specific surgical prophylaxis for MRSA carriers) and in trends in the prevalence of MRSA upon admission. Other potential confounding factors and selection biases might have affected the validity of the clinical study. Furthermore, the size of the sample in the previous years was not reported and the baseline comparability of the two populations in the pre- and post-intervention periods was not demonstrated. Finally, the evidence came from a single institution, a teaching hospital, which might not be representative of patients admitted to other medical centres.

Costs:
The authors did not explicitly state which perspective was adopted, but the cost categories used suggest that the viewpoint was that of the hospital. A breakdown of cost items was not given and the costs were presented as macro-categories. The data on unit costs and quantities of resources used were not presented. The costs were presumably derived from the hospital, although this was not clearly stated. A single price year was not reported, although it would have been useful given that the costs were measured in different time periods.

Analysis and results:
A synthesis of costs and benefits was not carried out given the use of a cost-consequences framework. The issue of uncertainty was not addressed and sensitivity analyses were not carried out. The generalisability of the study results was
neither investigated nor discussed.

**Concluding remarks:**
The study had some methodological limitations which might affect the validity of the authors' conclusions.

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