The costs and benefits of hospital MRSA screening

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 clinical and economic impact of a universal rapid screening programme for methicillin-resistant *Staphylococcus aureus* (MRSA), on hospital admission, to reduce nosocomial infections. The authors concluded that rapid screening reduced the MRSA bacteraemia cases and the annual glycopeptide costs. These benefits and savings justified the costs of testing. The methods had some limitations and key areas of uncertainty were not investigated. Caution is required when assessing the authors' conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study examined the clinical and economic impact of a universal rapid screening programme for methicillin-resistant *Staphylococcus aureus* (MRSA), on hospital admission, to reduce nosocomial infections.

Interventions
The screening strategy used a polymerase chain reaction (PCR) test and was compared against elective and targeted screening, using the culture-based CHROMagar test, for emergency department admissions (both medical and surgical) and critical care patients.

Location/setting
UK/hospital.

Methods
Analytical approach:
The analysis was based on one study, with a short follow-up. The authors did not explicitly state the perspective adopted.

Effectiveness data:
The clinical evidence came from a prospective study, with a retrospective control group. Patients in the culture-based screening group were identified from the pre-study period (April 2007 to March 2008) by a retrospective review of hospital admission reports. Patients in the rapid screening group were identified between April 2008 and March 2009. During this study period, 20,461 emergency admissions were screened using the PCR test. During the pre-study period, 21,461 elective admissions were screened, using culture-based tests. Each patient was followed-up until hospital discharge. The number of MRSA bacteraemias identified was the key endpoint for the screening strategies.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
No summary benefit measure was used. The number of MRSA bacteraemias identified was the primary outcome of the clinical analysis.

Cost data:
The economic analysis included the costs of rapid testing (staff salaries, equipment, and consumables), MRSA bacteraemias, and glycopeptide treatment. All costs and resource quantities were derived from the hospital databases...
and tariffs from the Department of Health. They were in UK pounds sterling (£), for the price year 2008.

Analysis of uncertainty:
Not considered.

Results
In the pre-study period, there were 40 cases of MRSA bacteraemia (28 were hospital-acquired) and the costs of hospital-acquired infections ranged from £188,888 to £245,924. The cost of glycopeptides amounted to £251,168.

In the study period, nine MRSA bacteraemia cases (five hospital-acquired) were reported and the costs of hospital-acquired infections ranged from £33,730 to £43,915. The cost of the PCR tests was £396,285 and the cost of glycopeptides amounted to £124,060.

The estimated savings from the reduction in bed days due to the decrease in MRSA cases and the reduction in glycopeptide use (£127,108) ranged from £282,266 to £329,117.

Authors’ conclusions
The authors concluded that rapid screening reduced the hospital-acquired MRSA bacteraemia cases and annual glycopeptide costs. The benefits and savings justified the costs of testing.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear as the period before universal screening was compared with that after its introduction. The authors highlighted the fact that a comparison between the PCR test and the culture-based test was beyond the scope of their analysis.

Effectiveness/benefits:
A design that enrols patients in two different periods is associated with some limitations. The homogeneity of the study groups was not considered, even though the sample of patients was large. The authors acknowledged that the introduction of other interventions at the same time could have confounded their analysis, but the decrease in time to receipt of the results of screening was not affected by these other initiatives. The results might have been affected by time-related bias and other factors, such as trends in disease and changes in hospital management. These issues were not explicitly taken into account in the analysis. The analysis was carried out at one large hospital, and might not be applicable to other settings.

Costs:
The authors did not explicitly state the perspective adopted, but the cost categories and their sources suggested the selection of a hospital perspective. The cost information was from the hospital database and the costs were presented as category totals. The estimates were treated deterministically and no sensitivity analyses were carried out on them. The price year was reported. It would have been interesting had the total incremental cost per patient associated with universal PCR testing, compared with the pre-study period, been estimated.

Analysis and results:
The study results were extensively presented. The economic and clinical outcomes were not combined and a cost-consequences analysis was conducted. No sensitivity analyses were carried out to investigate the uncertainty. The authors stated that contrasting results were generally found in the published literature for the cost-effectiveness of universal PCR screening. These study results cannot be transferred to other settings and are specific to the authors’ context. The authors highlighted the fact that the rapid screening test also had the advantage of reassuring patients.

Concluding remarks:
The methods had some limitations and key areas of uncertainty were not investigated. Caution is required when assessing the authors’ conclusions.
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