Systematic patients' hand disinfection: impact on meticillin-resistant Staphylococcus aureus infection rates in a community hospital

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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 study examined the cost-effectiveness of a systematic waterless washing and gel rinse disinfection of all patients’ and visiting relatives’ hands to reduce the rate of methicillin-resistant Staphylococcus aureus (MRSA) transmission in a community hospital setting. The authors concluded that systematic hand hygiene of patients and visiting relatives was a highly effective and inexpensive preventive measure against MRSA infections acquired in hospital. The study had some methodological limitations that might affect the validity of the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study examined the cost-effectiveness of a systematic waterless washing and gel rinse disinfection of all patients’ and visiting relatives’ hands to reduce the rate of methicillin-resistant Staphylococcus aureus (MRSA) transmission in a community hospital setting.

Interventions
The intervention consisted of a team of attendants, trained to meet all patients and visiting relatives, teach them the benefits of proper hand hygiene, clean their hands with an alcohol gel rinse twice a day on every weekday, and give out brochures on nosocomial (acquired in hospital) infections. This was compared with no intervention (historical control).

Location/setting
Canada/hospital.

Methods
Analytical approach:
The analysis was based on a single study with a short-term horizon (period of hospitalisation). The perspective adopted in the study was not explicitly stated.

Effectiveness data:
The analysis was based on a retrospective cohort study with historical control, which was carried out at a single 250-bed community hospital. Outcomes over the intervention period (year 2003 to 2004; 9,317 admissions; 95,590 patient-days) were compared with the previous historical year (2002 to 2003; 10,208 admissions; 101,410 patient-days). The number of daily in-patients was slightly higher in the intervention period (276 versus 263 patients). The primary endpoint was the rate of nosocomial MRSA infections. The reduction with the introduction of the programme by type of infections was reported.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
No summary benefit measure was used. The primary outcome was the rate of MRSA infections.

Cost data:
The costs included the intervention programme (salaries and supplies) and the savings associated with prevented cases of MRSA-related events (infections without sepsicaemia and bloodstream infections). The costs of the programme were taken from the hospital database. The costs of MRSA events were based on a previous study applicable to the study setting. Costs were in Canadian dollars (CAD) and presumably referred to 2001 and 2003 prices.

Analysis of uncertainty:
Not considered.

Results
The rate of nosocomial methicillin-resistant Staphylococcus aureus (MRSA) infections fell from 10.6 to 5.2 per 1,000 admissions with the hand disinfection intervention (a reduction of 51%). The rate of MRSA sepsicaemias per 1,000 admissions fell from 1.3 to 0.2 with the intervention (a decrease of 85%). The rate of respiratory infections per 1,000 admissions was reduced from 4.9 to 1.5 (a reduction of 69%). All other endpoints (reduction of other types of infections) improved in the intervention period.

The total project costs were CAD 170,000. Assuming that the intervention prevented 51 cases of infection (of which ten would have been sepsicaemias), the savings of reduced MRSA infections would have been CAD 858,843. Thus, the implementation of the programme led to total net savings of CAD 688,843.

Authors' conclusions
The authors concluded that systematic hand hygiene of hospital patients and visiting relatives appeared to be a highly effective and inexpensive preventive measure against methicillin-resistant Staphylococcus aureus nosocomial infections.

CRD commentary
Interventions:
The selection of the comparators was appropriate as the proposed programme was compared with no preventive intervention (historical control).

Effectiveness/benefits:
The clinical analysis was based on a retrospective comparative study. This design was subject to potential limitations; some were acknowledged in the paper. Outcomes were assessed in two different years and the impact of potential time-related bias was not taken into account. Factors other than the programme might have affected the change in MRSA rates over time. The baseline comparability of study groups for clinical and demographic factors was not shown. The evidence came from a single institution, which might not be representative of other health care settings. No statistical analyses were conducted to deal with these issues. The rate of MRSA was the immediate outcome of a preventive programme, but the use of a more comprehensive benefit measure (lives saved or quality-adjusted life-years gained) would have been more appropriate to capture the impact of the programme on patients’ health.

Costs:
The authors did not explicitly state the perspective of the analysis, which appeared to have been that of the hospital given the cost categories included and sources used. However, little information was provided on the economic side of the study. Resource use and unit costs for the programme were taken from the hospital database, so were relevant to the setting of the study. The cost of MRSA was taken from a published study, which was not described. Costs were treated deterministically and were not varied. The price year was not explicitly reported.

Analysis and results:
The analysis was a cost-consequences design, so cost-effectiveness ratios were not calculated. No sensitivity analyses were carried out to deal with uncertainty, which was not investigated. The study results were clearly reported. The authors acknowledged some limitations of their analysis, mainly on the design of the clinical study, but they did not make any attempt to overcome these issues. The study results were relevant to the setting, but might not be transferable to other jurisdictions.

Concluding remarks:
The study had some methodological limitations that might affect the validity of the authors’ conclusions.
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