SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The study aimed at evaluating the relationships between MRSA prevention measures (e.g. hand hygiene devices, single rooms), antimicrobial use, and MRSA prevalence rate in 173 European hospitals.

DESIGN IMPLICATIONS

Because of the relatively large sample of hospitals in the study, the results regarding the effectiveness of alcohol-based hand rubs and single rooms in controlling MRSA are more generalizable to many different hospitals.

Alcohol-based hand rubs and single rooms should be incorporated in the building design for healthcare settings where MRSA infections pose as significant challenge to patient safety.

Antimicrobial Drug Use and Infection Control Practices Associated With the Prevalence of Methicillin-Resistant Staphylococcus Aureus in European Hospitals

MacKenzie, F. M., Bruce, J., Struelens, M. J., Goossens, H., Mollison, J., Gould, I. M.
2007 | Clinical Microbiology and Infection
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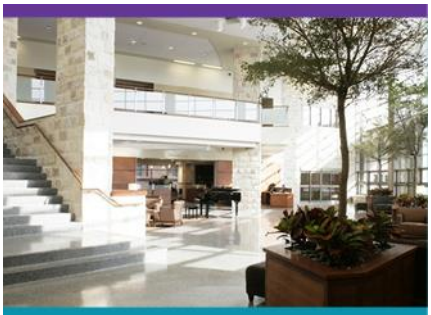
Key Concepts/Context

Methicillin-resistant Staphylococcus aureus (MRSA) is a type of bacteria that are resistant to antibiotics such as methicillin and cephalosporins. MRSA may cause serious infections to patients with open wounds, invasive devices, and weakened immune systems, which are in some cases extremely difficult to treat. In recent years, the rate of MRSA infections has been increasing globally and causing high morbidity, mortality, and healthcare cost.

MRSA are typically spread by contact transmission. It is increasingly recognized that MRSA prevention requires a multifaceted approach which may be more effective than individual measures alone.

Methods

In this observational and cross-sectional study, postal and online questionnaires were used to collect data about resistance prevalence, antimicrobial usage, and infection control measures at individual participating hospitals. Resistance prevalence rate was calculated as the proportion of clinical S. aureus isolates that were resistant to methicillin/oxacillin for all inpatients in 2001. Antimicrobial usage was defined as the number of daily does per 100 occupied bed-days. Additional questions were used to collect data on infection control measures implemented at the hospitals. Correlational and multiple linear regression analyses were conducted to reveal relationships between resistance prevalence rate, antimicrobial use, and MRSA prevention measures while controlling potential confounding factors such as



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hospital size, teaching hospital status, regional variations, and variations in measurement of resistance prevalence.

Findings

Both resistance prevalence rate and antimicrobial usage varied significantly across geographical regions. Higher antimicrobial usage was correlated with high rate of resistance prevalence. Several infection control measures were found to be strongly associated with lower rate of resistance prevalence including the use of alcohol-based hand ribs for hand hygiene and the placement of MRSA patients in single rooms.

Limitations

There were several limitations of this study:

- The data collection relied on the voluntarily reporting from individual hospitals. Variation might exist across different hospitals in the collection of original data such as clinical S. aureus isolates as well as the reporting of aggregated data.
- The hospitals were not randomly selected but voluntarily participated. The results could be biased because participating hospitals might be more willing to engage in infection efforts than non-participating hospitals.
- The main outcome measure--MRSA resistance prevalence rate--was not the best outcome measure for inter-hospital comparison of MRSA infection risk. For the purpose of study, a better outcome measure could have been the number of new MRSA cases per patient days. However, the data were not available from most of the participating hospitals.