

EV0700

ePoster Viewing

Infection control issues

"Multidisciplinary investigation of an outbreak caused by methicillin-resistant *Staphylococcus aureus* (MRSA) in a medical ICU – 2013/2014, Prague, Czech Republic"

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Background /Objectives

The introduction and spread of methicillin resistant *Staphylococcus aureus* (MRSA) in health-care facilities can be controlled by screening and consequent compliance with hygiene procedures.

In this study, we present the results of an MRSA outbreak investigation in an 8-bed medical ICU of a tertiary hospital in Prague. The identification of seven MRSA positive patients in the beginning of 2014 led to closure of the ward for several weeks. A multidisciplinary outbreak investigation was initiated in order to i) identify the reason and the source of the outbreak and ii) describe MRSA transmission in the department to improve infection control measures.

Methods

A case was defined as a patient with a positive laboratory finding for MRSA and at least one hospital stay in the relevant department between 01.01.2012 and 18.02.2014.

Registered cases were retrospectively investigated regarding hospital stay characteristics. Archived MRSA isolates from patients were characterized by microbiological methods which included antimicrobial susceptibility pattern, toxin profile, phage typing, Spa typing and PFGE typing. Additionally, MRSA screening was performed from staff and environment.

To investigate the reason for the outbreak, we performed staff interviews addressing stress level, personal relations and work conditions and audited the nursing practices and operational procedures in the ICU.

Results

For the study period, 31 cases were registered and overlapping hospitalizations could be shown over long periods of time.

Antibiotic and toxin profiles were similar for all 36 analysed isolates. Spa typing defined two prominent spa types (t003/t014) circulating in the department within the study period, but could not identify the source. In contrast, Phage- and PFGE typing could both determine one patient as the probable index case, who newly introduced the outbreak strain on 23.12.2013 (Phage type 54/812, PFGE type A4). In addition, a new employee was tested positive for nasal carriage and a high environmental contamination in the department could be correlated with the outbreak strain by microbiological investigations.

The audit and social-psychological investigation revealed an inappropriate work routine and worsening working conditions in terms of hygiene procedures and communication in the last three months prior to the outbreak.

Conclusion

Introduction of the outbreak strain in combination with new staff and increasing stress levels probably led to disregard of infection control practices and thus to staff colonization and environmental contamination, which served as the source for new infections.

This study demonstrates the advantages of using different typing methods and investigating social aspects and work-related factors in health-care related outbreaks. Only the multidisciplinary approach helped to reveal the true burden and transmission of MRSA as well as problems in patient care in its full extend and underlines that continuous communication and education should be essential parts of routine infection control practices.