

TITLE:ANTIMICROBIAL RESISTANCE PROFILES AND CROSS-TRANSMISSION OF METHICILLIN-RESISTANT *Staphylococcus aureus* STRAINS IN HOSPITALS FROM RIO DE JANEIRO

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ABSTRACT:

Methicillin resistant *Staphylococcus aureus* (MRSA) is an important agent of healthcare-associated infections (HAIs). This pathogen is resistant to all beta-lactams, except to anti-MRSA cephalosporins, and often resistant to other classes of antimicrobials, reducing treatment options. MRSA screening of patients is one important measure to avoid cross-transmission in hospitals. Then, the present study aimed to determinate the antimicrobial resistance profile of MRSA isolates recovered from colonization or infection of patients attended in different hospitals in the state of Rio de Janeiro. In addition, it was investigated the spread of MRSA isolates among patients of one of these hospitals. Twenty-seven MRSA isolates were obtained from nasal swabs (18), hemoculture (4), catheter tip (1), tracheal secretion (2), abscess (1) and unknown origin (1). The bacterial isolates were isolated of patients attended in ambulatory, emergency unit, and of inpatients, including in intensive care unit (ICU), from nine hospitals localized in five cities in June and July 2014. Conventional phenotypic tests and MALDI-TOF were performed for bacterial identification, disk diffusion (11 antimicrobials) and microdilution (vancomycin) for determination of the antimicrobial resistance profile, and PFGE for investigation of the MRSA spread among patients. Resistance was observed to norfloxacin (77.8%), ciprofloxacin (74.1%), erythromycin (74.1%), clindamycin (29.6%), and chloramphenicol (25.9%), beyond the beta-lactams. All isolates were susceptible for gentamicin, rifampicin, tetracycline, sulfamethoxazole-trimethoprim and vancomycin. Vancomycin MIC ranged from 0.5 µg/mL to 2.0 µg/mL. Resistance profiles varied from resistant to only beta-lactams to resistant to other five antimicrobials. MRSA cross-transmission was detected in one of the hospitals. Five MRSA strains, isolated from inpatients in ICU and in another unit, were determined as possibly related by PFGE. In conclusion, most of MRSA strains circulating in the hospitals investigated in the studied period were resistance to several other antimicrobial, beyond the beta-lactams. Our data suggest also failures in the control measures of multidrug-resistant bacteria cross-transmission in one of the hospital.

Keywords: *Staphylococcus aureus*, antimicrobial resistance, MRSA, cross-transmission, hospital

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