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Antimicrobial susceptibility, inducible macrolide-lincosamide-streptogramin B, and clonal diversity patterns of nosocomial methicillin-resistant Staphylococcus aureus strains isolated in Hacettepe University adult hospital

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Abstract: Aim: Nosocomial infections due to methicillin resistant Staphylococcus aureus (MRSA) are an important problem with limited therapeutic options. The aim of this study was to determine the vancomycin, teicoplanin, linezolid, tigecycline, erythromycin, gentamicin, ciprofloxacin, rifampin, trimethoprim/sulfamethoxazole, and clindamycin susceptibility, inducible macrolide-lincosamide-streptogramin B ($iMLS_B$) resistance, and clonal diversity patterns of 109 mecA positive Staphylococcus aureus strains isolated from patients with nosocomial infections in Hacettepe University Adult Hospital between 2002 and 2004. Materials and methods: The nosocomial isolates of S. aureus from various clinical samples (58 blood, 45 pus, 6 catheter) were identified by Sceptor (Becton Dickinson, USA) automated system. Polymerase chain reaction (PCR) was performed for the presence of mecA gene of the MRSA isolates. The susceptibility to vancomycin, teicoplanin, linezolid, and tigecycline was determined by Etest (AB Biodisk, Sweden) and to the other antibiotics by disk diffusion methods according to the CLSI recommendations. Inducible macrolide-lincosamide-streptogramin B ($iMLS_B$) resistance phenotypes were determined by the double disk method. Pulse field gel electrophoresis (PFGE) was performed to examine the clonal diversity. Results: All MRSA strains were susceptible to vancomycin, teicoplanin, linezolid, and tigecycline with MIC_{90} (µg/mL) values of 2, 2, 2, and 0.25, respectively. The isolates were highly resistant (≥90%) to gentamicin, ciprofloxacin, and rifampin, whereas the susceptibility to trimethoprim/sulfamethoxazole was 89%, to clindamycin was 62%, and to erythromycin was 46%. $iMLS_B$ resistance was determined among 13% of the MRSA strains. Thirteen different clones were shown by PFGE, whereas 80% of the isolates were in a dominant clone. Conclusion: Vancomycin, teicoplanin, linezolid, and tigecycline were highly active against nosocomial isolates of MRSA in our hospital. Although these are effective therapeutic options for MRSA, the high rate of cross-contamination of the patients is a matter of concern. We should pay more attention to infection control practices.

Key words: Methicillin-resistant Staphylococcus aureus (MRSA), antibiotic susceptibility, inducible macrolide-lincosamide-streptogramin B ($iMLS_B$), pulse field gel electrophoresis (PFGE)

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