



Prevalence of Methicillin Resistance in Staphylococci in A Tertiary Care Hospital

KEYWORDS

MRSA, MRCONS

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ABSTRACT

Methicillin resistant *Staphylococcus aureus* (MRSA) and methicillin resistant coagulase negative staphylococcus (MRCONS) are associated with high morbidity and mortality rates. The present study was undertaken to know their prevalence in a tertiary care hospital of Amritsar, Punjab. A total of 6429 pus and urine samples received from indoor and outdoor patients from November 2013 to June 2014 were processed as per standard procedures. Out of the total 6429 samples 306 (15.75 %) staphylococcus were isolated. These samples were identified by gram stain, coagulase, catalase and other biochemical reactions. Antimicrobial susceptibility testing was done by Kirby-Bauer disc diffusion test and Methicillin resistance was tested using cefoxitin 30 microgram disc on Muller Hinton Agar. Out of 306 staphylococci isolates 216 (70.4%) were *S.aureus* and 90 (29.6%) were coagulase negative staphylococci (CONS). Methicillin resistance was found in 112 (51.8%) of *S.aureus* and 47(52.2%) in CONS by cefoxitin disc diffusion method.

Introduction: Methicillin resistant staphylococcus aureus (MRSA) and methicillin resistant coagulase negative staphylococcus (MRCONS) are associated with high morbidity and mortality rates. These isolates are re-emerging as important agents of hospital acquired infections. Penicillin resistance is of three types:

Production of beta lactamase (penicillinase) which inactivates penicillin by splitting the beta lactam ring. This is controlled by plasmids.

Development of tolerance to penicillin by which the bacterium is only inhibited but not killed.

Alteration in the penicillin binding protein (PBP 2a) reducing the binding of beta lactam antibiotics to cells¹. This is normally chromosomal in nature. This type of resistance also extends to cover beta lactamase resistant penicillins (methicillin, dicloxacillin, nafcillin, oxacillin, etc.) and the cephalosporins and strains are called MRSA. Strains unable to resist these antibiotics are classified as methicillin-sensitive *Staphylococcus aureus* (MSSA)² Methicillin acts on the cell wall of bacteria by binding to the terminal D-alanine residues of peptidoglycan chain and interferes in the cross-linking steps. Without the cross-linking reaction, the cell wall becomes weak, as a result the cytoplasmic contents are released leading to cell death. Key determinant of methicillin resistance is the *mecA* gene, which encodes in a

novel penicillin-binding protein (PBP2a)¹. The present study was undertaken to know their prevalence in a tertiary care hospital of Amritsar, Punjab.

Material and method: A total of 6429 pus and urine samples received from indoor and outdoor patients from November 2013 to June 2014 were processed as per standard procedures. Out of the total 6429 samples 306 (15.75 %) staphylococcus were isolated. These samples were identified by gram stain, coagulase, catalase and other biochemical reactions. Antimicrobial susceptibility testing was done by Kirby-Bauer disc diffusion test and Methicillin resistance was tested using cefoxitin 30 microgram disc on Muller Hinton Agar.

Results: Out of 306 staphylococci isolates 216 (70.4%) were *S.aureus* and 90 (29.6%) were coagulase negative staphylococci (CONS). Methicillin resistance was found in 32 (14.8%) of *S.aureus* and 7 (7.4%) in CONS by cefoxitin disc diffusion method.

Conclusion: MRSA has re-emerged as an important nosocomial agent in tertiary care hospitals, particularly in intensive care units. Infection control measures, such as placing hospitalized patients colonized or infected with MRSA in contact precautions (i.e., the use of gowns and gloves), have been demonstrated to limit the spread of this pathogen^{3,4}.

REFERENCE

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