INTRODUCTION

Staphylococcus aureus is the most frequent cause of infections in the community and in healthcare settings. S. aureus with the mecA gene or a minimum inhibitory concentration (MIC) of oxacillin ≥4 µg/mL has been associated with MRSA.

An increasing number of cases of Staphylococcus aureus strains that are mecA and PBP2a positive but phenotypically susceptible to oxacillin are being reported worldwide.

Oxacillin-susceptible mecA positive Staphylococcus aureus (OS-MRSA) poses a significant problem as its oxacillin susceptibility contributes to misidentification by traditional susceptibility testing and consequent treatment failure.

AIM & OBJECTIVE

To determine the incidence of oxacillin-susceptible mecA positive Staphylococcus aureus (OS-MRSA).

MATERIALS AND METHOD

A total of 395 MRSA were isolated from various clinical specimens and initial identification was done by using standard microbiological techniques at tertiary care hospital of Mysore, South India.

All the isolates were subjected to Kirby-Bauer disc diffusion test using oxacillin 1µg disk.

Oxacillin Minimum Inhibition Concentration (MIC) was determined by automated Vitek2 system. The mecA gene validated the MRSA status of each isolate by PCR amplification method.

RESULTS

• PCR technique confirmed total of 156 (62.27%) isolates as MRSA out of 395 S. aureus isolates, collected from various clinical samples. (Figure 1)

• Disk diffusion method identified total of 21 isolates were identified as oxacillin sensitive and 15 isolates were oxacillin intermediately sensitive or borderline oxacillin resistant. (Table 1)

• Vitek2 system identified 6 Oxacillin sensitive-MRSA isolates (OS-MRSA) having an oxacillin MIC of ≤2µg/mL, among 156 (mecA positive) MRSA isolates. (Table 1)

• Three of the mecA positive MRSA isolates were demonstrated as oxacillin sensitive by both disc diffusion and the Vitek2 method.

DISCUSSION

• Conventional phenotypic methods based on oxacillin susceptibility can easily misinterpret OS-MRSA as MSSA because OS-MRSA is an oxacillin-susceptible variant of MRSA. It has been noted some contradict in detecting some of the OS-MRSA in the current investigation.

• The present study confirmed total 156 isolates were mecA gene positive by PCR technique, of which 21 isolates were oxacillin sensitive which is similar to the study of Teresa Conceic et al., where 17.7% (n=29/164) were mecA positive OS-MRSA and Sahar Zenaipour Ahrahi et al., where total 54.54% (360/660) of the S. aureus isolates were mecA positive and 6.25% of the students were OS-MRSA carriers. [1, 2]

• In the study of K. Saeed et al., 63 % clinical isolates had oxacillin MIC of ≤0.5µg/mL, the remaining of isolates >0.5µg/mL and for the remaining of isolates 4.5 % had the MIC ranged between 0.5µg/mL and ≤1µg/mL. Isolate were tested positive for the mecA gene, confirming OS-MRSA. [3]

• In our study one OS-MRSA isolate showed oxacillin MIC ≥2µg/mL and also sensitive by oxacillin disk diffusion method, which is similar to the study of Alexandros Ikonomidou et al., where oxacillin MIC was <2µg/mL for two isolates which were mecA positive. [4] The result of Y. Hososaka et al., also found similar kind of result where out of 437 MRSA isolates, 57 isolates showed oxacillin MIC <2µg/mL of which and 6 strains were found to be mecA positive by pulse field gel electrophoresis. [5]

CONCLUSION

This study found isolates with lower oxacillin MICs but OS-MRSA prevalence was relatively lower. Routine laboratory identification of MRSA by using oxacillin disk may sometimes results in false negative MRSA, which may lead to treatment failure due to inaccurate antimicrobial usage. Hence it is important to use better methods to differentiate OS-MRSA from MRSA by combining phenotypic and genotypic methods.

REFERENCES


