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RETROSPECTIVE STUDY OF MRSA DETECTION AMONG PATIENTS WITH WOUND INFECTION IN A TERTIARY CARE HOSPITAL OF SOUTH GUJARAT

Microbiology

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ABSTRACT

Purpose: To study the prevalence and the antibiotic susceptibility pattern of methicillin resistant staphylococcus aureus (MRSA).
Methods: 625 wound samples were analyzed which are received in Microbiology department during study period. After microscopy and culture and identification of staphylococcus aureus; Antibiotic susceptibility testing was done by Kirby-Bauer disc diffusion method on Muller-Hinton agar according to CLSI guidelines 2019. MRSA was detected by disc diffusion test by using Cefoxtin (30µg) disc. All data was collected and systematically analyzed.
Result: A total 625 samples of wound swabs were examined out of which Staphylococcus aureus were isolated in 310 (49.60%) samples; from these 100(32.35%) samples were MRSA. Antibiotic susceptibility was done for these MRSA samples which showed 99%, 99% and 100% sensitivity respectively to Linezolid, Vancomycin and Teicoplanin. Resistance of 92%, 33% and 98% respectively towards Fluroquinolones, Gentamycin and Penicillin G was noted.
Conclusion: This study shows 32.25% resistance which indicates relatively high prevalence of MRSA. Isolates that are resistant to other tested antibiotics are also reported. This data has an important implication for the quality of patient's care in hospital setting especially in antibiotic selection, infection control practices and need for additional studies.

KEYWORDS

methicillin resistant staphylococcus aureus, antibiotic susceptibility, wound infection

INTRODUCTION:

Staphylococcus aureus is a leading cause of nosocomial infection and surgical wound infections [3]. It has developed resistance to many antibiotics in recent years. Methicillin resistant staphylococcus aureus (MRSA) is a much reported public health problem throughout the world. The evolution of new genetically distinct community acquired and livestock acquired MRSA and extended resistance to other non beta lactam including vancomycin has only amplified the crisis[2].

Emerging resistance patterns and varying susceptibility warrants vigilance in studies assessing prevalence and susceptibility of MRSA. These studies provide essential clues regarding antibiotic selection and health care practices to tackle the issue of antibiotic resistance. In this study we evaluate 625 wound samples for the presence of MRSA and assess its prevalence and antibiotic sensitivity and present the data methodically.

MATERIALS AND METHODS:

This was a retrospective study for period of July-2019 to December-2019 conducted in Department of Microbiology, Government medical college, Surat, Gujarat, India after attaining proper scientific committee and ethical committee permissions. A total 625 wound samples were analysed which are received in Microbiology department during study period.

Samples were processed for microscopy and culture as per routine protocol of laboratory on Blood agar and MacConkey agar plates. The plates were incubated overnight at 37℃ in bacteriological incubator.

Staphylococcus aureus were identified by golden yellow pigmentation and β-hemolysis on blood agar plates and standard biochemical tests like Catalase test, Coagulase test (slide and tube), Mannitol sugar fermentation test. Antibiotic susceptibility testing was done by Kirby-Bauer disc diffusion method on Muller-Hinton agar according to CLSI guidelines 2019. MRSA was detected by disc diffusion test by using Cefoxitin (30 µg) disc. Data was collected and analysed systematically using appropriate software.

RESULTS:

Total 625 samples of wound swabs were examined: Staphylococcus aureus were isolated in 310 (49.60%) samples. Out of these 100 (32.25%) were MRSA and remaining 210 (67.74%) were Methicillin sensitive staphylococcus aureus.

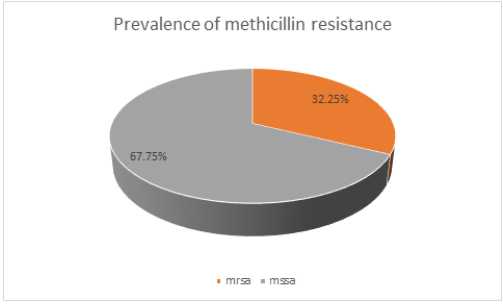

Figure 1: pie chart depicting prevalence of MRSA in our study in positive staphylococcal growths.

In this study MRSA showed 98% resistance to primary line drug like Penicillin G and 48% resistance to Clindamycin. 92% and 33% resistance to Fluroquinolones and Gentamycin respectively was noted and 55% resistance to Cotrimoxazole was found in this study.

MRSA showed 99% sensitivity to Vancomycin and showed 99% and 100% sensitivity respectively to Linezolid and Teicoplanin.

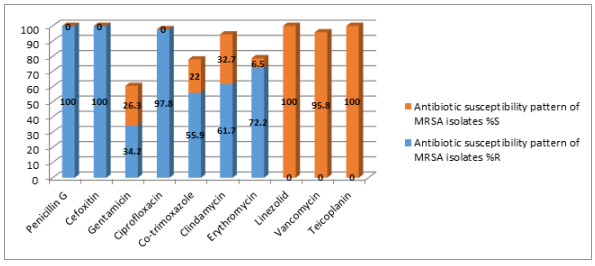

Figure 2: graph showing antibiotic susceptibility pattern of MRSA in our study

DISCUSSION:

Wound infection due to MRSA is a major concern in resource limited countries, where there are poor infection prevention and control measures. In present study, the prevalence of MRSA was 32.25% which is lower than 42% & 40%[4] in study by Sangeeta Joshi et al and

33.07%[5], study by Deepshikha Bhowmik et al.

In present study MRSA showed 100% resistance to penicillin which is similar to the Yeterefwork Tsige et al[3] and Sangeeta Joshi et al[4] . MRSA showed 34.2%resistance to Gentamycin which is lower compare to 53.8% and 58.3% in Yeterefwork Tsige et al[3] and Sangeeta Joshi et al[4] . MRSA showed resistance to 55.9%, 61.7% and 97.8% to Cotrimoxazole , Clindamycin and Ciprofloxacin respectively which is higher compare to 53.8%, 7.7% and 61.5% respectively in Yeterefwork Tsige et al.[3] and in study by Sangeeta Joshi et al[4] there is 55.6%, 46.6% and 79.3% resistance.

MRSA showed 95.8% sensitivity to Vancomycin (4.2 % intermediate sensitivity to Vancomycin) and 100% sensitivity to Linezolid in present study which is almost similar to Sangeeta Joshi et al[4] which showed 100% sensitivity to both. In present study MRSA showed 72.2% resistance to Erythromycin which is similar in comparison with Sangeeta Joshi et al[4].

CONCLUSION:

This study shows 32.25% resistance which indicates relatively high prevalence of MRSA. Isolates that are resistant to other tested antibiotics are also reported. This data has an important implication for the quality of patient's care in hospital setting especially in antibiotic selection, infection control practices and need for additional studies.

Compliance With Ethical Standards:

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee.

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