



PREVALENCE AND ANTIBIOGRAM OF METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS FROM VARIOUS CLINICAL SAMPLES IN RURAL TEACHING HOSPITAL - ANDHRA PRADESH

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ABSTRACT

MRSA (Methicillin-resistant Staphylococcus aureus) is a major causative agent for hospital acquired infections.Prevalence of MRSA is increasing and leading to increased mortality,morbidity and cost of treatment due to increased number of days of hospital stay.so present study was conducted .

Method: various clinical samples such blood urine,sputum,body fluids,BAL,wound swab and pus were collected under aseptic precautions and inoculated on blood agar,MacConkeys agar and incubated overnight 37⁰c,once the growth was observed, bacterial identification was done by standard biochemical test and special test such as coagulase.mannitol fermentation confirms staphylococcus aureus .MRSA detection done as per CLSI (Clinical and Laboratory Standards Institute) guidelines by cefoxitin disc diffusion method.Antibiotic sensitivity testing done by modified kirby baures disc diffusion method.out of 1224 samples, 371 were identified as staphylococcus aureus out of which 128 were found to be MRSA(methicillin resistant Staphylococcus aureus).prevalence of MRSA was 34.5%.Incidence and prevalence of MRSA is increasing at alarming rate,most of MRSA were found to be resistant to commonly used antibiotics.Antibiotic policy and hand wash hygiene are important to control hospital acquired infection by MRSA.

KEY WORDS: MRSA,Staphylococcus aureus,antibiotic sensitivity testing,coagulase test.



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INTRODUCTION

MRSA (Methicillin-resistant Staphylococcus aureus) is a major nosocomial pathogen world wide¹. Prevalence of MRSA isolated from nosocomial infections ranges from 14 to 39%² & 40% to 70% of total S. aureus nosocomial infections in intensive care units (ICUs)³. MRSA causes boils, pustules and impetigo. In systemic infections, it causes osteomyelitis, mastitis, septicemia, wound infection and occasionally toxic shock syndrome⁴. Methicillin-resistant Staphylococcus aureus (MRSA) is a multi-drug resistant isolate, resistant to Macrolides, lincosides, aminoglycosides and beta-lactams which include Penicillin and Cephalosporins⁵. The Drug of choice for MRSA is Vancomycin, and other drugs such as Linezolid and Teicoplanin. Early diagnosis of MRSA prevents their cross-transmission in the wards, decreases morbidity, helps to determine appropriate antimicrobial therapy, shortens patient's hospital stay and lowers hospital costs⁶. Present study was undertaken to study the prevalence of MRSA and its antibiotic sensitivity pattern in our institute.

MATERIALS AND METHODS^{7,8,9}

This was a retrospective study conducted in a rural teaching hospital for duration of 1 year. The records were taken from the Microbiology department from March 2012 to April 2013. The different clinical samples were sputum, blood, pus, urine, body fluids, BAL, wound swabs. The specimens were cultured on blood agar and MacConkey agar plates and incubated aerobically at 37°C for 48 hours. All isolates were identified using standard tests like catalase, slide and tube

coagulase, and growth on Mannitol salt agar⁷. MRSA detection was performed using the cefoxitin (30µg) disc diffusion method recommended by the Clinical and Laboratory Standard Institute (CLSI).⁸ The isolates were considered methicillin resistant if zone of inhibition was 21 mm or less. Modified Kirby Bauer Disc Diffusion method was used as per CLSI guidelines for antibiotic⁸. Susceptibility testing for MRSA isolates against the following antibiotics- Ampicillin (10 µg), Ciprofloxacin (5µg), Gentamicin (10µg), Clindamycin (2 µg), Cefuroxime (30 µg), Cefotaxime (30 µg), Erythromycin (15 µg), Ofloxacin (5 µg), Co-trimoxazole (1.25/23.75 µg), and Vancomycin (30µg) obtained from HI media, Mumbai. S. aureus ATCC 25923 was used as a standard control strain. Antibiotic sensitivity testing interpreted after incubation for 24h at 37°C. The zone diameters measured around each disk were interpreted on the CLSI guidelines.

RESULTS

Total no of samples: 1224 out of which 371 were Staphylococcus aureus, Total no of MRSA isolated from 371 Staphylococcus were found to be 128 (34.5%) and 243 MSSA. Maximum number of samples were urine samples 128 (table 1). Most number of MRSA were isolated from Medicine department 35.9% (table 2). Antibiogram of MRSA shows that they are 100% sensitive to vancomycin and MRSA were found to be resistant to most of the commonly used antibiotic. Ampicillin showed 96.09% resistance.

Table 1
Different specimens from which staphylococcus was isolated

SPECIMEN	Numbers
1. blood	27
2. urine	128
3. pus	92
4. Wound swabs	83
5. sputum	26
6. Body fluids	12
7. BAL	03
Total	371

Table 2
specimen distribution for MRSA from different departments of Hospital

Departments	MRSA	percentage
Medicine	46	35.9
Surgical	29	22.65
Dermatology	16	12.5
OBG	14	10.93
orthopedics	23	17.96
TOTAL	128	

Table 3
Resistance pattern of various commonly used antibiotics against MRSA.

ANTIBIOTICS	MRSA(n=128)	percentages
Ampicillin	123	96.09%
gentamicin	91	71.09%
Amikacin	92	71.87%
cotimoxazole	65	50.78%
Cefuroxime	62	48.43%
Erythromycin	86	67.18%
Vancomycin	nil	-
Cefoxitin	128	100%
Cefotaxime	74	57.81%
Ciprofloxacin	95	74.21%
ofloxacin	87	67.96%
clindamycin	82	64.06%

DISCUSSION

MRSA is one of the major contributor to hospital acquired infections and other community acquired infections. With advent of more and more newer multidrug resistant organisms such as MRSA and ESBL's the mortality and morbidity is rapidly increasing. In the present study out of total samples 1224, staphylococcus aureus were 371 and 128 were found to be resistant to methicillin i.e prevalence of MRSA was found to be 34.5%. Our study is in accordance with a study conducted by Mathur SK et al⁹ and S Vidhani

et al¹⁰ Mathur SK et al⁹ showed prevalence of MRSA as 32% which was similar to our study. MRSA were found to be 100% sensitive to vancomycin and resistant to antibiotics such as penicillin groups, ampicillin, Moderately sensitive to gentamycin and erythromycin and fluoroquinolones (table 3).

CONCLUSION

Prevalence of MRSA was found to be high in our study. It was found to be resistant to most commonly used antibiotics. Selection of antibiotics depends on antibiotic susceptibility testing and regular surveillance of

MRSA. Hospital antibiotic policy should be formulated based on changing trends of sensitivity pattern. There should be judicious use of potent antibiotics such as Vancomycin and save them for emergencies i.e. treatment of resistant and life-threatening infections.

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