ORIGINAL RESEARCH PAPER
VOLUME-6 | ISSUE-6 | JUNE-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

Prevalence of MRSA in a teaching hospital in Western Maharashtra.

Microbiology

Dr Aparajeet Walawalkar Assistant Professor, Department of Microbiology, RCSM Govt. Medical College, Kolhapur, Maharashtra.

Dr Dhruv Mamtora Consultant and Head of Microbiology and infection control, S. L. Raheja Hospital, a Fortis associate, Mahim, Mumbai, Maharashtra.

ABSTRACT

OBJECTIVE : To determine the prevalence of Methicillin Resistant Staphylococcus aureus (MRSA) in our institution.
METHODS : A 5 Month period prevalence study of all specimens. Excluded areas were OPD patients. Our facility is a referral/teaching hospital in Govt sector in Western Maharashtra, Kolhapur. A total of 1340 Specimens were received from various specialties across hospital. Cefoxitin disc diffusion was used to identify methicillin resistance amongst isolated Staphylococci.
RESULTS : The total number of specimens were 1340 and of those 54 % were gram positive isolates. In these,10 % were Enterococcus, 8 % Streptococcus, and rest 82 % Staphylococci. Out of Staphylococci – 10.5% were methicillin resistant.
CONCLUSION : The overall prevalence of gram-positive infections is high in specimens we received in our hospital. Though prevalence of MRSA remains concordant with many of the published Indian studies. Limitations being not all patients followed for clinical correlation.

KEYWORDS:

Methicillin resistant Staphylococcus aureus(MRSA), Cefoxitin disc, Beta-lactams

Introduction – Staphylococcus aureus is an important cause of both community as well as hospital acquired infections. Its ability to develop resistance against commonly used antimicrobials and presence of various virulence markers enhances its importance, especially as a nosocomial pathogen. Beta lactam antimicrobials are often used in treatment of infections due to S.aureus, however increasing resistance has been reported in number of clinical isolates to these antimicrobials by way of production of beta lactamase enzyme and altered penicillin binding proteins. The mechanism of resistance to beta lactam group of antimicrobials in staphylococci is either production of beta lactamase or mecA mediated modified penicillin binding protein(PBP). These mechanisms can be detected phenotypically by testing the sensitivity of the isolate to penicillin and cefoxitin respectively.1,2,6 Hence a study was conducted by a teaching hospital to know the prevalence of Methicillin resistant staphylococcus aureus(MRSA).

Material and methods –
A study was conducted by teaching hospital as a prevalence study for the duration of five months. Samples of Indoor patients and critical areas were only included for study. Outpatient department samples were excluded as they are representative of community isolates. All samples submitted to microbiology laboratory for aerobic culture and sensitivity were processed and identified up to species level. Samples with no growth were excluded and only samples with growth were included for study. Total samples studied were 1340. Of the total samples, the staphylococci were identified up to species level and Methicillin resistance was studied using Kirby Bauer's disc diffusion method using cefoxitin disc. The interpretation was done as per 2016 CLSI guidelines1.

Results and discussion:-

Distribution of isolates

	Number	Percentage
Gram positive	725	54%
Gram negative	615	46%
Total	1340	100%

Table 2. Distribution of gram positive isolates

Isolate	Number	Percentage
Staphylococcus species	595	82.06%
Enterococcus species	73	10.06%
Streptococcus species	57	7.86%

Table 3. Distribution of Staphylococcal isolates

Isolate	Number	Percentage
Methicillin Resistant	63	10.58%
Methicillin sensitive	532	89.42%
Total	595	100

The isolate pattern is as follows:-

Total isolates were 1340 of which 54% were gram positive isolates. Amongst gram positive isolates, staphylococci were maximum amounting to 595 corresponding to 82%. Enterococcus species comprised 10% of isolates followed by streptococci at 7.86% (~8%) of isolates.

Amongst staphylococci, Methicillin resistance was seen in 63 isolates(10.58%) and Methicillin sensitive isolates were 532(89.42%).

With time, the staphylococci have acquired resistance, to almost all the antimicrobial agents by various mechanisms for drug resistance. Beta lactams are commonly available antibiotics for use in government general hospitals. However, with the emergence of Methicillin resistance and allergic reactions, it has become challenging to treat gram positive infections. The mechanism of resistance for staphylococci to Methicillin is either beta lactamase or mecA mediated resistance which can be detected by using sensitivity to penicillin and cefotixin disc respectively.1,2,3

MRSA proportion varies from country to country. It ranged from 0.4% in Swedon to 48.4% in Belgium.4 Though MRSA is endemic in india, the incidence of MRSA varies from 25% in western India to 50% in south India.4 A study from Delhi revealed that MRSA prevalence in nosocomial SSTI (skin and soft tissue infection) varied from 7.5 to 41.3% between the teaching hospitals4,5.

In spite of the different studies reporting high MRSA incidence, the MRSA incidence at our hospital was lower compared to other teaching hospitals. The reason may be large number of community patients and high number of OPD patients. However in absence of comparative regional data, this is the first study done in western Maharashtra in government teaching hospital highlighting the incidence of MRSA.

The limitation of study is that the data is over a period of five months and also community and hospital acquired MRSA were not studied differently considering the resource constraints and non availability of molecular methods with government teaching hospitals. Another important limitation is lack of follow up of patient for clinical

correlation which could not be done due to majority of people were coming as reference to tertiary care center for major surgical procedures or critical care services only and follow up was done at either sub-district level or at primary health care centers or even at private nursing homes.

References:-

1. CLSI. Performance Standards for Antimicrobial Susceptibility Testing; Twenty-First Informational Supplement. CLSI document M100-S21. Wayne, PA: Clinical and Laboratory Standards Institute;2016.
2. Philippe M, Yok-Al Q & Michel P. G. Staphylococcus aureus (Including Staphylococcal Toxic Shock). In: Mandell GL, Bennett JE & Dolin R, editors. Mandell, Douglas & Bennett's Principles & Practice of Infectious Diseases. 6th ed. Elsevier Churchill Livingstone; 2005. p. 2321-2351.
3. Ananthanarayan. R, Paniker J. Text Book of Microbiology 8th edition, University Press: 2009. 195-203.
4. Indian Network for Surveillance of Antimicrobial Resistance (INSAR) group. Methicillin resistant Staphylococcus aureus (MRSA) in India: Prevalence & susceptibility pattern. Indian Journal of Medical Research. 2013 Feb 1;137(2):363.
5. Gadepalli 9. R, Dhawan B, Kapil A, Sreenivas V, Jais M, Gaind R, et al. Clinical and molecular characteristics of nosocomial methicillin-resistant Staphylococcus aureus skin and soft tissue isolates from three Indian hospitals. J Hosp Infect 2009; 73 : 253-63.