



VANCOMYCIN & LINEZOLID - SENSITIVE ANTIBIOTICS FOR MRSA

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Abstract:

Antibiotics are revolutionary invent of 20th century . Penicillin was first serendipitous discovery that open the door of golden era of antibiotics. Indiscriminate antibiotics use create the problem of non-responsiveness i.e. resistance. Resistance of staphylococcus aureus is one of the grave clinical situations responsible for morbidity and mortality .Staphylococcus aureus. resistant to methicillin (a member of penicillin group) is called as methicillin resistant staphylococcus aureus or MRSA . Vancomycin and linezolid are commonly indicated in MRSA infections.

Most of microbiological surveys were generally done at government teaching institutions. Therefore this study is conducted to analyze the status of MRSA " occurrence as well as sensitivity" from private centers. Being an ideal available agent against MRSA, emphasis is given to vancomycin and linezolid .

KEY WORDS:

Antibiotics, MRSA infections.

INTRODUCTION

Advent of antimicrobials is most important landmark in medical science . Antimicrobial is a broad term which includes all the agents used against infection caused by microbes .It includes anti-bacterials, anti-virals , anti-protozoals and anti-fungal etc .Although anti bacterial are backbone of clinical disciplines to save life in life threatening conditions but they are highly misused in present scenario .The recent emergence of antibiotic resistance in bacterial pathogens is a very serious development that threaten the end of golden era of antibiotic. Availability of antibiotics without prescription, injudicious use in community, irrational combination as FDC, dose, duration, and irrational prescriptions are important reasons behind development of this resistance.

Among the antibiotics resistance, Methicillin resistant *Staphylococcus aureus* (MRSA) is emerging situation. MRSA is strain of *Staphylococcus aureus* , resistant to large number of antibiotics specially betalactams. Betalactams includes penicillins as well as cephalosporins, In spite of a causative pathogens in most of the disease , treatment is challenging due to lack of effective and economical antibiotics . Although institutes and tertiary care centers are main place of authentic study but we can't underestimate share of private sector in reporting .

We conduct a study of antibiograms of Methicillin Resistant *Staphylococcus Aureus* (MRSA) from private microbiological centers. Main aim of our study is to point out sensitivity status of vancomycin and linezolid .

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Material & Method :

This study is based on reports, in between January to December 2012 from private centers. A retrospective analysis of culture sensitivity of 102 S. aureus isolates (specimens- pus from surgical wounds) was done.

Observations And Results:

Out of the total 102 S. aureus isolates, 36 isolates were resistant to oxacillin (prevalence 35.29%) designated as MRSA. MRSA strains were showing 100% sensitivity to vancomycin and linezolid . Sensitivity pattern of other antibiotics were variable and below expected.

Discussion:

For an antibiotic to be effective, it must be reached target site in pharmacologically active form. Bacterial resistance to an antimicrobial agent is attributed to following reasons -

- (i) The drug does not reach its target
- (ii) the drug is not active
- (iii) the target is altered.

Methicillin resistant Staphylococcus aureus (MRSA) are endemic in hospitals and in community. Resistance to penicillins and other beta lactam is due to one of the mechanisms -

- * Inactivation of antibiotic by penicillinase (beta lactamase),
- * Modification of target penicillin binding proteins(PBP).
- * Impaired penetration of drug to target PBP
- * Efflux pumps.

Beta lactamase production is the most common mechanism of resistance. Altered target PBP is other basis of resistance.

Penicillinase (beta lactamase) resistant penicillins are methicillin, nafcillin, oxacillin, cloxacillin flucloxacillin and dicloxacillin . Most of them are currently not marketed. Majority of infections are caused by microbes that elaborate the enzyme penicillinase . Penicillinase resistant penicillins have a side chain that protect the beta lactam ring from penicillinase produced by staphylococcus .Theoretically the patients with staph infection should receive penicillinase resistant penicillins. The role of penicillinase resistant penicillins as the agents of choice for most of staphylococcal infections is now changing with the increasing incidence of methicillin resistant strains. Staphylococcus aureus that are resistant to these penicillins are designated as methicillin resistant staphylococcus aureus or MRSA because methicillin was the original agent of this class. Methicillin is now not in use due to their toxicity especially interstitial nephritis. Meanwhile methicillin resistant staphylococcus are resistant to beta lactam i.e. penicillins as well as cephalosporin. Vancomycin, lenezoid, quinupristin-dalfopristin and daptomycin are active against such infections.

Vancomycin is easily available and prescribed as drug of choice. Vancomycin is an antibiotic produced by Streptococcus orientalis, effective against gram positive bacteria .It is bactericidal and effective against methicillin resistant Staphylococci as well as beta lactamase producing strains. Poorly absorb orally, intramuscular injections are painful therefore given by intravenous route . Side effects are local thrombophlebitis and generalized cutaneous reaction (Red Man Syndrome). Lenezoid ,a member of oxazolidines is active against gram positive microbes. It should be reserve for infection caused by multiple resistant gram positive bacteria. Because of its unique mechanism of action (inhibition of protein synthesis) lenezoid is active against strain that are resistant to other agents such as methicillin resistance, vancomycin intermediate and vancomycin resistant staphylococcus

Conclusion:

MRSA emerged as a nosocomial pathogen about a half century back, causing increased mortality and morbidity. In addition to its severe consequences of infection MRSA strains are resistant to many currently available antibiotics. Infection controlling measures, use of antiseptic, ethical as well as rational antibiotic recommendation are important preventive steps to maintain antibiotics effectiveness . Prevalence of MRSA is variable in different geographical areas ,In our study it is approximately 35 percentages . Regarding to sensitivity pattern, Vancomycin and Lenezoid are still sensitive antibiotics for MRSA.

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