Research Article

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Prevalence of Methicillin Resistant Staphylococcus Aureus (MRSA) In A Secondary Care Hospital In North Eastern Part of India

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Abstract

Aim: *In today's scenario, Nosocomial infection is a foremost problem in world. Methicillin resistant staphylococcus aureus (MRSA) strains are not only resistant to several antibiotics but also, show a particular ability to spread in hospitals of many countries. The main objective of the present study is to determine the prevalence of MRSA in surgical wound infections and also to define the antimicrobial susceptibility patterns of the strains isolated.*

Materials and Methods: *A total of 133 culture positive Staph.aureus were taken from surgical site wound infections for the study during the period from March 2016 to February 2017. Routine Antibiotic Susceptibility testing was performed and interpreted as per latest CLSI guidelines. Methicillin resistance was detected using cefoxitin disc diffusion method.*

Results: *In total of 133 samples, 81 (60.9%) were found to be MRSA. However, no strain was resistant to Vancomycin, Linezolid or Teichoplanin.*

Conclusion: *Vigorous antimicrobial stewardship and strengthened infection control practices are mandatory to prevent spread and reduce emergence of resistance. Customary surveillance of hospital-associated infection and monitoring of antibiotic sensitivity pattern is required to reduce MRSA prevalence.*

Keywords: Staph Aureus, Multidrug Resistance, MRSA

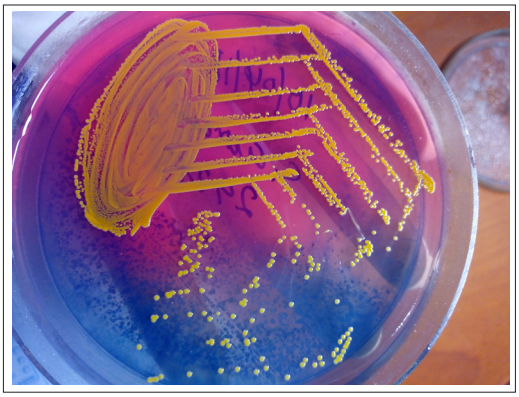
Introduction

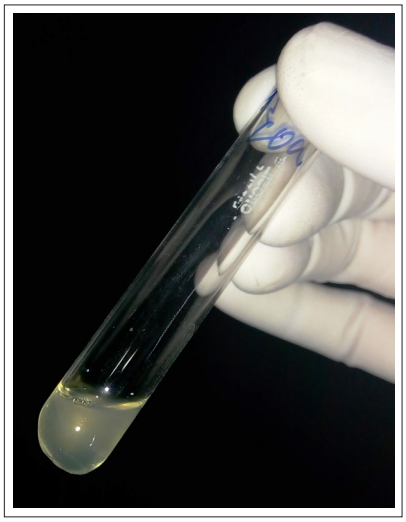
Methicillin resistant staphylococcus aureus (MRSA) has been documented as one of the fatal pathogens in both hospital and community settings [1]. The first case of MRSA was isolated way back in 1961. Till date, there has been an escalating rate of infections caused by MRSA worldwide resulting in increased mortality and morbidity statistics. The main etiology of MRSA is production of an altered penicillin –binding protein, a 78 kDa protein termed PBP2a, which has a low affinity for beta-lactam antibiotics. The production of PBP2a is mediated by the mecA gene present in MRSA.

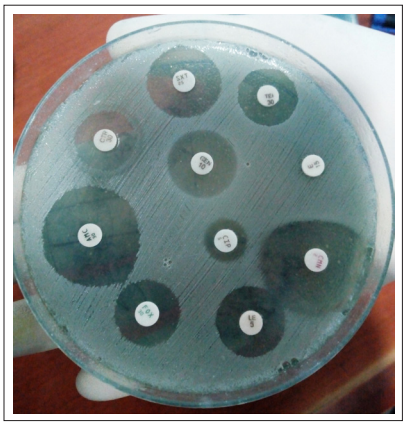
There are many factors which has made the detection of MRSA complicated .Many studies supports that, resistance to Methicillin in Staph.aureus is heterogeneous in majority of isolates [2]. Thus, heterogeneous strains are composed of two populations of cells relatively susceptible cells and highly resistant cells .These strains appear phenotypically sensitive routinely carried out in all laboratories [3].

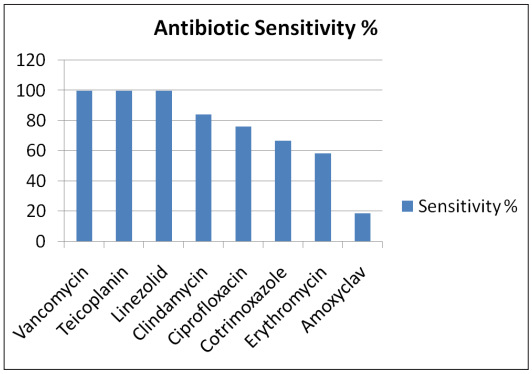
Materials and Methods

A total of 133 culture positive Staph aureus (SA) taken from surgical wound infections for the study during the period from March 2016 to February 2017. Staph.aureus was identified by characteristics growth on blood agar, MacConkey agar, (Fig1) Gram-staining and various biochemical tests, e.g.catalase test, free and bound coagulase test (Fig 2). Isolation and Identification was done as per universal guidelines. The MRSA strains were identified by using cefoxitin disc (30mcg) on Mueller Hinton agar and antibiotics susceptibility testing was done by Kirby-Bauer disc diffusion method and zones interpreted as per CLSI 2017 guidelines (Fig 2). ATCC Staph aureus 25923 was used for quality control. Identification of Staph.aureus was confirmed by standard methods and the antimicrobial testing was performed by Kirby-Bauer disc diffusion test (Fig 2). Interpretation criteria were those of the latest CLSI guidelines. During a period of one year a total of 133 culture positive Staph.aureus were taken from surgical wound infections for the study. In total of 133 samples 81 (60.9%) were found to be MRSA .More than 100% of MRSA were resistant to Amoxicillin. MRSA sensitivity percentage for other antibiotics used for screening were as Augmentin (18.7%), Erythromycin (58.4%), Cotrimoxazole(66.8%), Ciprofloxacin (76.2%), Clindamycin (84.1%) (Table-1). However, no strains were resistant to Vancomycin, Teicoplanin and Linezolid.









Discussion

MRSA infections are generally multi-drug resistant and their therapy entails a huge financial drain on hospital resources. Good infection control practices with emphasis on strict handwashing can minimize this burden by reducing their transmission. Identification of MRSA Carriers and their treatment along with other measures can reduce its further. Prudent use of antimicrobial agents is one of major steps to reduce growing patterns of antibiotic resistance. Most common reason for multi drug resistant MRSA is indiscriminate use of antibiotics without drug sensitivity testing which may be due to lack of advanced laboratory facilities or negligence on the part of medical practitione. 23.2% of the multidrug resistant MRSA isolated from clinical specimens by Majumder from Assam.Even higher percentage of multidrug resistant MRSA had been reported by Anupurba from Uttarpradesh [4,5] .

Conclusion

Vigorous antimicrobial stewardship and strengthened infection control practices are mandatory to prevent spread and reduce emergence of resistance. Customary surveillance of hospital-associated infection and monitoring of antibiotic sensitivity pattern is required to reduce MRSA prevalence.

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