

## A Profile of bacteremia cases due to MRSA and MSSA

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### Introduction

Bacteremia caused by *Staphylococcus aureus* continues to be a common problem worldwide. Antimicrobial drug resistance in *S.aureus* arose early after the development of antimicrobial agents and continues to evolve. This resistance limits the potentially efficacious agents and results in frequent use of glycopeptides, such as vancomycin. The reliance on vancomycin causes difficulties because vancomycin has been shown to be less effective than isoxazolyl penicillins (e.g., flucloxacillin) in treating severe infections caused by *S.aureus*. This may be one explanation for the higher death rate associated with bacteremia caused by MRSA, compared with that caused by MSSA. *S. aureus* remains a common cause of bloodstream infections of community onset; increasing numbers of these being caused by MRSA. Some of these infections are caused by hospital strains carried into the community by patients or healthcare workers, while others are caused by true community strains in patients who have had no recent healthcare contact. Certain population of patients have a significantly greater risk of invasive staphylococci infection than normal population; represented by those receiving hemodialysis, peritoneal dialysis, IV drug abusers, patients suffering from Diabetes Mellitus and alcohol abusers. *S.aureus* have developed resistance to virtually all antibiotic classes which include Aminoglycosides, Tetracyclines, Cotrimaxazole, Quinolones, and new Oxazolidinones. Methods for susceptible testing of MRSA include disk diffusion method, Broth dilution method, agar screen methods. This study helps us to have a clear knowledge about the risk factors associated with MRSA and the antibiotic sensitivity pattern of the organism which guides to formulate an empirical therapy for the patients with staphylococcal infections.

### Materials and methods

This hospital-based retrospective study was conducted in the clinical microbiology laboratory of Kasturba Medical College hospitals (Ambedkar Circle & Attavar). Blood samples of 100 (N=100) patients that

had come to the Microbiology lab of the hospital were studied for presence of MRSA or MSSA and assessed based on various morbidities associated with the disease.

### Results

Out of 100 cases of staphylococcal aureus bacteremia, 38% of cases were methicillin resistant. Out of 100, maximum cases (27%) belonged to age group more than 60yr, followed by age group 50-60yr and 40-50yr who constituted 22% and 24% respectively. Majority of cases (56.4%) with MRSA bacteremia had history of surgery prior to infection and 30.8% of cases had a history of antibiotic therapy. It was seen that majority of the cases with MRSA and MSSA infection developed sepsis. It was seen that resistance to  $\beta$ -lactamase group of drugs by both MRSA and MSSA (2.56% and 3.27% respectively) were in small numbers. In our study, both MRSA and MSSA had shown marked sensitivity (66.67% and 73.77%) to Amino glycoside group of drugs. In our study, moderate number of MRSA and MSSA were sensitive to 3rd generation Cephalosporin with few cases showing resistance.

### Conclusion

A total number of 100 cases were analyzed. Of these 60 were males and 40 were females. Of these, 38 cases were methicillin resistant and 62 cases were methicillin sensitive. Out of 100, maximum cases belonged to age group more than 60yrs of age. Hypertension, diabetes mellitus, alcoholism, smoking, renal insufficiency, COPD, heart failure, malnutrition are the co-morbidities associated with both MRSA and MSSA bacteremia. Sepsis was found to be the major complication of both MRSA (56.4%) and MSSA (52.5%) bacteremia followed by fever, septic shock and multiple organ dysfunction. It was observed that remarkable number of patients had a surgery prior to bacteremia, 56.4% in MRSA and 27.9% in MSSA bacteremia. Sensitivity to amino glycosides is more compared to  $\beta$ -lactamase and 3rd generation cephalosporin in both MRSA (66.67%) and MSSA (73.77%).