SUMMARY AND CONCLUSION

The study was carried out during the period from December 2010 to January 2015 after getting ethical clearance. During this study total 1000 confirmed strains of *S. aureus* were selected and subjected to oxacillin disc diffusion, oxacillin screen agar, oxacillin minimum inhibitory concentration and cefoxitin disc diffusion tests as per standard CLSI guidelines for detection of MRSA strains.

Genotypic (PCR) method for detection of meca gene was used for all 301 strains which were detected as MRSA by phenotypic methods and 18 MSSA strains for detection of cryptically methicillin resistant strains. Detection of meca gene using PCR remains the gold standard test for detection of MRSA. PCR method was used to evaluate the efficacy of above four phenotypic methods. Following important observations were made in the present study.

- Prevalence of MRSA in this area is 26.50%.
- The sensitivity and specificity of phenotypic methods used for MRSA isolation vary according to different factors such as type of used media, size of inoculum, incubation time, etc. Sensitivity and specificity of cefoxitin disc diffusion test correlates 100% with gold standard PCR for meca gene for detection of MRSA.
- This study provides an evidence that cefoxitin is a surrogate marker, stronger inducer of the meca gene than oxacillin and detects all staphylococci that are meca positive. The study reveals that cefoxitin disc diffusion is considered a better indicator than oxacillin based phenotypic methods for the presence of the meca gene in *S. aureus*.
- Cefoxitin disc diffusion can be preferred in clinical microbiology laboratories because it is easy to perform, does not require special technique for media preparation and is cost effective, that the test conditions are similar to those used for other antibiotics as compared to other phenotypic methods.
- So we conclude that, cefoxitin disc diffusion test is superior to oxacillin disc diffusion test, oxacillin MIC and oxacillin screen agar test.
- Discrepancies in the detection of MRSA by different phenotypic methods may affect patient management adversely, thereby highlighting the importance of accuracy in the detection of MRSA.
The antibiotic sensitivity results show that all MRSA isolates are resistant to many antibiotics as compared to MSSA isolates. Also, most of the MRSA in this study showed co-resistance to many classes of antibiotics at the same time and thus they are qualified as multi-drug resistant *S. aureus* (MDR-MRSA).

Vancomycin is the universally accepted drug of choice. We found all MRSA isolates to be susceptible to vancomycin. It is the only antibiotic which gives sensitivity in all 100% *Staphylococcus aureus* strains.

The most effective way to prevent therapeutic crisis due to MRSA infections is to do continuous surveillance of the antibiotic resistance profiles of local *S. aureus* isolates to formulate antibiotic policies and to have an effective infection control program.