2. Aim & Objectives

*S. aureus* is a frequent source of skin infections, which can usually be treated without antibiotics, but it can also cause serious surgical wound infections, bloodstream and bone infections and pneumonia. The burden of such infections, according to recent studies by Centers for Disease Control and Prevention is close to 2 million nosocomial infections annually resulting in nearly 20,000 deaths and associated costs close to $50 billion. Physicians are particularly concerned about *S. aureus* because of its ability to survive in the presence of antibiotics designed to kill it. In 1972, according to the Centers for Disease Control, only two percent of *S. aureus* infections were drug-resistant. By 2004, 63 percent were resistant to the antibiotics commonly used to treat them [Archer 1998]. As more strains develop resistance to existing drugs, treating the infections is becoming increasingly challenging [Lowy 1998].

Indian literature shows that MRSA incidence was as low as 6.9 per cent in 1988 and reached to 24 and 32.8 per cent in Vellore (Pulimood *et al.* 1996) and Lucknow (Mathur *et al.* 1994) in 1994, respectively and was of the same order in Mumbai, Delhi and Banglore in 1996 and in Rohtak and Mangalore in 1999 (Verma *et al.* 2000). However, in some of the centres, it was as high as 80 per cent and in India the isolation varied from 20-40 per cent (Geha *et al.* 1994). In Kerala no such studies have been reported so far.

In India the prevalence and spread of MRSA has been recognized late which led to its emergence as a real threat to community and hospital settings. Prevalence of MRSA has widely been reported in several parts of India where MRSA has become a major nosocomial pathogen and few states have even reported the emergence of VISA and VRSA strains. Studies on MRSA have been conducted in all most all the Southern states except Kerala where no such reports are available so far. So we have undertaken this study to determine the antimicrobial susceptibility pattern and the molecular characteristics of MRSA obtained in Anand district of Gujarat. Genotyping of strains isolated in Anand have not been done till now. The aim of this study was to determine the Antibiotic sensitivity pattern and molecular typing of *Staphylococcus aureus* strains isolated in Anand district over a six year period.
A total of 3000 clinical samples were screened for microbiological cultural and antimicrobial sensitivity test. Out of these, 1355 isolates were staphylococci, 850 strains were staphylococcus aureus and 505 strains were coagulase negative staphylococci. Clinical isolates of methicillin resistant *Staphylococcus aureus* were tested from various tertiary care centres in Anand district and between January 2009 and January 2015. The different types of clinical specimen were selected for the study. Including neonatal septicemic patients. Nasal colonization in medical professionals, physically and mentally retarded students and non medical professionals were screened for staphylococci. Phenotypic characterization by antibiogram analysis and genotypic characterization based on molecular analysis of resistance genes have been carried out.

**OBJECTIVES**: The aims of the present study are………

(A) To estimate the prevalence rate of *Staphylococcus aureus*, CONS and MRSA strains from various clinical samples.

(B) To investigate MRSA and drug resistance from neonatal Septicemic patients

(C) To investigate the carrier rate of *Staphylococcus aureus* in the anterior nares of healthcare personnel.

(D) To investigate the carrier rate of *Staphylococcus aureus* in the anterior nares of physically and mentally retarded students of Anoopam Mission.

(E) To find out the resistant rates against various types of antimicrobial agent (different antibiotics) used for treating Staphylococcus infections.

(F) To characterize the isolates of *S. aureus* in relation to beta-lactamase production.

(G) To correlate the relations between Beta-lactamase producer *Staphylococcus aureus* isolates showing multi-resistance against various antibiotics.
(H) To find out prevalence of specific genotypes as to analyze the association between the genotypes of isolates with the clinical relevance. (16S rRNA, mec A, nuc, fem A and bla Z genes) using published protocol and primers.

(I) Epidemiological and molecular characterisation of community and hospital acquired staphylococcus aureus and CONS.

(J) Statistical Analysis done to determine significance of differences in resistance rates using chi-square test, Pearson’s test (SPSS version). P-value less than 0.05 were considered statistically significant.