Summary and conclusion
The present investigation was an attempt towards evaluating the scenario of drug resistance in clinical isolates of staphylococci from the city of Mysuru, Karnataka state, South India. The study was performed on selected staphylococcal isolates from three major hospitals in Mysuru during a period from April 2011 to December 2013. The majority of the isolates were from skin and soft tissue infections (SSTIs), followed by cases of surgical site infections, bacteremia, osteomyelitis etc.

We observed a high rate of methicillin resistance in *S. aureus* (86.9%) as well as in coagulase negative staphylococci (80.6%), which included *S. haemolyticus* and *S. epidermidis*. Multidrug resistance (≥3 classes of non-beta-lactam drugs) was observed in 71% of the methicillin resistant isolates. A high rate of ciprofloxacin- and erythromycin-resistance was conspicuous among our isolates. With regard to *S. haemolyticus*, we made a few important observations which included its predominance in causing septicaemia in neonates and more importantly, the appearance of linezolid resistant strains. Linezolid is a drug of last resort to treat complicated infections caused by multidrug resistant strains of Gram-positive pathogens. In our study we have come across strains of *S. haemolyticus* with multiple as well as transmissible mechanisms of linezolid-resistance. This includes the presence of multiantibiotic resistance gene, *cfr* (chloramphenicol florfenicol resistance), resistance-conferring mutations such as G2576T and Met156Thr in 23 S rRNA gene and the ribosomal protein L3 respectively. PFGE analysis confirmed the clonality of these strains. This for the first time *cfr*-carrying isolates are reported from India. The study, thus apprises the medical fraternity in the country on the importance of a strict surveillance of linezolid resistant strains in the hospitals and also on the judicious use of high end antibiotic like linezolid in clinical practice.

Our study reiterates the growing clinical importance of coagulase negative staphylococci as pathogens and more importantly as probable reservoirs of resistance genes. Our observation on the implications of *S. haemolyticus* in neonatal septicaemia is a disturbing development. As determination of ‘true infection’ by coagulase negative staphylococci is often challenging in clinical environment, clinicians and healthcare personals are to be more cautious and accurate while encountering coagulase negative staphylococci in clinical samples, especially in cases of bacteremia.
Our epidemiological typing data on community-acquired MRSA (CA-MRSA) reports a high prevalence of the lineage ST2371-t852-SCCmec IV [sequence type-spa type-SCCmec type], which has not been reported previously from Asian countries. This is a single locus variant (SLV) of the clone ST22. Another important finding from the present study is the first time documentation of the pandemic clone USA300 [ST8-t008-SCCmec IV] implicated in community infections in India. This is the most prevalent MRSA clone implicated in community-acquired infections in USA and many other western countries. USA300 is bestowed with many important features such as the presence of arginine catabolic mobile element (ACME) and speG gene which enables the successful persistence of this clone on the human host. We also observed the multi-antibiotic resistant lineage ST772, which is popularly known as the Bengal Bay clone, among our isolates. This is one of the established lineages of CA-MRSA in India and many Asian countries. With regard to toxin profile of the CA-MRSA strains, high prevalence of pvl (Panton-Valentine leukocidine) and egc (enterotoxin gene cluster) was noted.

Ours is an epidemiological study which analyzed a convenient number of isolates from a few hospitals in Mysuru. The results cannot be extrapolated to other hospitals/regions in the country. Nevertheless, we document new trends of drug-resistance patterns in staphylococci from Indian subcontinent. More surveillance studies across the country with the participation of major hospitals are needed to assess the scenario at the national level. Our study underlines the importance of the proper implementation of the recommendations made by ‘Chennai declaration’, a recent initiative by Indian medical fraternity, which has gained global recognition to tackle the problem of drug-resistance.