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Clonal spread of *Staphylococcus aureus* isolates with reduced sensitivity to chlorhexidine in Kuwaiti hospitals

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It is essential to reduce the bacterial load and ensure the effectiveness of hygienic conditions in hospitals. Chlorhexidine is one of the most widely used biocides. Since resistance genes to quaternary ammonium compounds have appeared more frequently in staphylococci, we aimed to identify *S. aureus* with reduced sensitivity to Chlorhexidine in Kuwaiti hospitals. We collected 97 methicillin-resistant (MRSA) and 100 methicillin-sensitive (MSSA) *S. aureus*. We amplified *mecA, blaZ, qac A/B, qacH, qacH2, qacG, smr, norA, PVL* and *agr* genes. Antibiotic sensitivity testing for 10 antibiotics and MIC/MBC of chlorhexidine were determined. MLST, spa typing and PFGE were used to identify genetic variations. The predominant genes were *mecA, blaZ, norA, qacA/B, smr,* while *qacG, qacH, qacH2* were not detected. All isolates were sensitive to vancomycin, teicoplanin and tigecycline. The range of MIC for chlorhexidine for *qacA/B* positive isolates was 4-30 mg/l, however the MBC (0.94-60 mg/l) was statistically greater than MIC ($p<0.0001$). Typing methods showed all the isolates with reduced sensitivity to chlorhexidine containing *qacA* were ST239-III-t945-PVL_. The presence of *qac* genes does not necessarily imply increased resistance to chlorhexidine or any other antimicrobial agents. However MBC of chlorhexidine was higher for the isolates containing *qacA/B* compared to those without. We observed clonality among the *qacA/B* positive isolates with reduced sensitivity to chlorhexidine (HA-MRSA-ST239-III-t945 PVL_). Reduced sensitivity may be a contributing factor to survival of this clone in hospitals. It is crucial to strictly monitor dilution standards to avoid low level exposure of HA-MRSA-ST239-III to biocides, specifically in the developing countries.

Biography

Leila Vali has completed her PhD from Edinburgh University and Postdoctoral studies from Medical College of Wisconsin, Milwaukee and Edinburgh University. She has been a Lecturer in Strathclyde University, UK and is currently an Assistant Professor in Kuwait University. He has published more than 25 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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