



Microbiological and Molecular Characterization of methicillin-resistant *Staphylococcus aureus* in Clinical Cultures Collected from Two Tertiary Care Hospitals in Southern Sri Lanka

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ABSTRACT

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a multidrug-resistant pathogen causing life-threatening infections. It can be classified as community-associated (CA) or healthcare-associated (HA), based on antibiotic susceptibility and molecular analysis. The objective of this study is to describe MRSA prevalence and predominant MRSA types identified in clinical cultures collected from patients admitted to Teaching Hospital-Karapitiya and General Hospital-Matara in Southern Sri Lanka. *S. aureus* isolates from consecutive clinical cultures and associated demographic data were collected from September 2019 for fourteen months from microbiology laboratories of the two hospitals. All *S. aureus* and MRSA isolates were confirmed using standard microbiological methods. Based on antibiotic susceptibility profile, isolates were classified as HA-MRSA (generally resistant to β -lactam antibiotics, erythromycin, clindamycin and fluoroquinolones) and CA-MRSA (generally resistant only to β -lactam agents and erythromycin), as described by the Centers for Disease Control and Prevention, USA. These two types were further confirmed as HA-MRSA (generally harbour SCCmecI, II and III) and CA-MRSA (generally harbour SCCmecIV and V) using Staphylococcal Cassette Chromosome *mec* (SCCmec) typing using standard methodology. *S. aureus* was isolated from 366 clinical cultures and 59.3% of them were MRSA (respiratory-70.83%, pus-60.4%, blood-54.8%, sterile fluids-50% and urine-50%). Majority of MRSA were from males (52.5%) and adults (≥ 18 years) (78.3%). Resistance to non- β -lactam antibiotics was observed as 96% to erythromycin, 68% to ciprofloxacin and 55% to clindamycin. Based on the ABST profile, a total of 96 (44%) isolates were classified as HA-MRSA and 90 (41%) as CA-MRSA. SCCmec typing showed that 59.6% of isolates that were classified as HA-MRSA carried SCCmecIII/ SCCmecI and 81% classified as CA-MRSA carried SCCmecIV/ SCCmecV. A total of 10.6% of isolates were none-typeable. The majority of *S. aureus* isolated from clinical cultures were MRSA. Prevalence of HA-MRSA and CA-MRSA was relatively similar. Further clinical and molecular investigations are needed to determine the implications of these findings.

Keywords: CA-MRSA, clinical cultures, HA-MRSA, prevalence, SCCmec type