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HIGH PREVALENCE OF *ccrC* AND *ccrA2* TYPE CASSETTE CHROMOSOME RECOMBINASE (*ccr*) FOUND IN THE STAPHYLOCOCCAL CASSETTE CHROMOSOME (SCC) ELEMENTS OF COAGULASE NEGATIVE STAPHYLOCOCCUS (CoNS) SPECIES ISOLATED FROM UKMMC

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Background:

CoNS are an important cause of nosocomial infection and are medically important as most CoNS are inherently resistant to methicillin (methicillin-resistant CoNS, MRCoNS). Methicillin resistance is conferred by the *mecA* gene which is carried on a mobile genetic element inserted into the staphylococcal chromosome, designated as staphylococcal cassette chromosome *mec* (SCC*mec*). As the incidence of CoNS infection is on the rise in our medical centre, we determined the prevalence and species diversity of CoNS isolated in 2009 and typed the SCC*mec* elements of each MRCoNS.

Materials and Methods:

Staphylococcal isolates from 2386 patients were collected in UKMMC in 2009. Coagulase and DNase tests were performed to identify CoNS strains. For 1181 CoNS index strains, methicillin susceptibility was determined via disc diffusion. Species identification and SCC*mec* typing were done using a multiplex PCR protocol with specific primers.

Results:

In 2009, the prevalence of CoNS among staphylococcus genus in our hospital was 49.5%. *S.epidermidis* was the most prevalent species among CoNS (69.1%) and MRCoNS (67.2%). Majority (44.7%) of the MRCoNS isolates were SCC*mec*-untypeable strains using the presently available protocol. Interestingly, 55.5% of MRCoNS in our institution harboured the cassette chromosome recombinase C (*ccrC*) gene, while 40.3% carried the *ccrA2* gene alone or in 10 combination patterns. Only 1%, 1%, 0.2%, 8.4%, 7.9% and 0.4% were typeable as SCC*mec* types 1, 2, 3, 4, 5 and 6, respectively.

Conclusion:

The high prevalence of MRCoNS in our medical centre is worrying as they can assemble and disseminate SCC*mec* elements amongst Staphylococci, leading to methicillin resistance. Furthermore, we are also concerned about the high abundance of *ccrC* and *ccrA2* located in the SCC*mec* elements, which may respectively mobilize and facilitate the spread of heavy metal and antimicrobial resistant genes. Vigilant infection control will be important in keeping CoNS infections minimal and to prevent it from conferring methicillin resistance to Staphylococcal isolates.

Keyword:

Coagulase negative staphylococcus (CoNS), methicillin resistant CoNS (MRCoNS), SCC*mec* typing