

Genes Encoding Adhesion and Biofilm Formation in MRSA in Palestine

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Introduction: *Staphylococcus aureus* ability to produce biofilm and adhesion makes them resistant to antimicrobial therapy. The current study aims to characterize MRSA strains and to determine the prevalence of genes encoding adhesion factors and biofilm formation, also their correlation with drug resistance.

Methodology: A total of 248 isolates of MRSA were collected from Palestinian patients, during 2015 to 2017. Biofilm formation was studied by microtiter plate assay, the strains characterized by staphylococcal chromosome cassette *mec* (SCC*mec*) typing, and screened for the *bbp*, *cna*, *ebpS*, *eno*, *fib*, *fnbA*, *fnbB*, *clfA*, and *clfB* genes that encode microbial surface components recognizing adhesive matrix molecules and *icaD/icaA*, *bap* and the staphylococcal accessory regulator (*sarA*) and *agr* group genes that associated with biofilm formation.

Results: The majority of isolates harbored SCC*mec* type IV, which is common in community-acquired MRSA strains. Most isolates also showed resistance to more than four of the tested antimicrobials. The results demonstrated that all (100%) of isolates were biofilm producers by the quantitative microtitre plate assays. The distributions of biofilm formation between isolates were 21%, 46.4%, 32.7% as high, moderate and weak, respectively.

All of the strains harbored *icaD/icaA* genes and produced biofilm ($P < 0.05$). None of the isolates harbored *bap*. Furthermore, 94.8% of isolates were positive for *eno*, 80.2% for each *clfA*, *clfB*, 78.2%, for *fnbA*, 76.2% for *ebps*, 62.2% for *fib*, 39.9% for *cna* and 29.0% for *fnbB*. Further, nearly 69.8% of the isolates were found positive for the gene *sarA*. All four *agr* groups were present; *agr* group 1 was predominant (39.5%) but *agr* group 2 strains carried more toxin genes and were more frequent toxin producers.

Conclusions: These results are important for epidemiological studies involving MRSA infections. Our findings showed that the MRSA carriage is high and the genetic variations of adhesion genes require further investigation.

Biography:

Kifaya Azmi has completed her PhD from Charite University School of Medicine, Berlin. She is one of the staff members of Al-Quds University, faculty of medicine, Teaching biochemistry and molecular biology. Recently working on MRSA project, published more than 35 papers in reputed journals.