



Genetic Identification of Biofilm Formation using Multiplex-PCR in *Staphylococcus aureus* Isolated From Indwelling Catheter Surfaces

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Abstract: Objective: *Staphylococcus aureus* is the infectious agent in the most severe catheter-related sepsis. It is also associated with biofilm-related diseases. This study was aimed to determine the biofilm producing ability through investigating the presence of *icaADBC* operon genes in *S. aureus* isolated from indwelling catheter surfaces as well as the relation between biofilm formation and presence of this operon.

Methods: Segments of catheters removed from 43 patients were cultured on mannitol salt agar plates. *S. aureus* were identified with the API- Staph System. Isolates of *S. aureus* were studied for biofilm producing capacity. The detection of *icaADBC* operon genes in all *S. aureus* isolate was done using Multiplex-PCR.

Results: From all the 43 samples included in this study 28 (65%) isolates were characterized as *S. aureus*. The biofilm production assay results showed that 19 (67.8%) of the 28 tested *S. aureus* isolates were attached at different amount. Attachment abilities in 10 (35.7%) isolates were strong, 6 (21.4%) isolates were moderate, 4 (14.2%) isolates were weak and 8 (28.5%) had no attachment. The Multiplex-PCR results showed that of 28 *S. aureus* isolates revealed the presence of *icaADBC* operon genes in 22 (78.5%) isolates. *icaAB* gene was present in 21 (75%) isolates whereas *icaD* and *icaC* genes were present in 27 (96.4%) and 26 (92.8%) of *S. aureus* isolates respectively.

Conclusion: The study of biofilm formation and genetic characteristics of biofilm genes in different isolates of *S. aureus* may allow a better understanding of the complex process of biofilm formation and infections caused by this microorganism.

Keyword: *icaADBC*, Biofilm, and Indwelling Catheter.