

The relationship between biofilm formation and presence of *fimH* and *mrkD* genes among *E. coli* and *K. pneumoniae* isolated from patients in Mosul

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ABSTRACT

Background and objectives: Biofilms have a major medical significance as they decrease susceptibility to antimicrobial agents. The decreased susceptibility to microbial agents within a biofilm arises from multiple factors, including physical impairment of diffusion of antimicrobial agents, reduced bacterial growth rates, and local alterations of the microorganisms (M.O) that may impair activity of the antimicrobial agent. The aim of the study was to investigate the biofilm formation among coliforms and study the relationship between biofilm formation and the presence of *fimH* and *mrkD* genes among *E. coli* and *K. pneumoniae* isolates respectively .

Materials and method: One hundred and seventy three clinical samples were collected from both gender who visited or admitted to AL- Salam General Teaching Hospital and AL- Wafa'a center for diabetic patients in Mosul city from April 2013 to February 2014, (110) urine samples from patients suffering from urinary tract infections (UTIs) and (63) from patients with diabetic foot infections (DFIs). All samples were cultured on selective media as MacConkey and blood agar aerobically. Coliform isolates are identified to species level depending on biochemical and physiological tests and using Rapid™ ONE panel kit to be conformed to the diagnosis. The ability of coliforms spp. for biofilm formation was assessed using qualitative and quantitative assay. The Congo red agar (CRA) method was used in the qualitative biofilm assay.

Results: Out of (85) bacterial spp. , 44(51.8%) species were biofilm producers. The tissue culture plate (TCP) method was used in the quantitative biofilm formation assay. The results showed that 46(54.1%) spp. produced biofilm strongly. All biofilm producing *E. coli* and *K. pneumoniae* spp. which gives strong biofilm formation by CRA method and non-biofilm producer spp. were subjected to PCR for determining the relation between biofilm formation and the presence of *fimH* gene in *E. coli* isolates and *mrkD* gene in *K. pneumoniae* isolates. The results revealed that all biofilm producing *E. coli* 15(100%) isolated from UTI samples were positive for *fimH* gene. While all biofilm producing *K. pneumoniae* 9(100%) and 5(100%) isolated from UTIs and DFIs respectively were positive for *mrkD* gene.

Key words: Biofilm, *fimH* and *mrkD* genes, *E. coli*, *K. pneumoniae*.

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