



Antibiofilm Effect of Biopolymer Dextran – Gentamycin- PVP Blend in Catheters

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Abstract : Objectives: The objective of this study was to determine the antibiofilm effect of biopolymer dextran produced by *Leuconostoc mesenteroides* ssp. *Mesenteroides* and their blends with gentamycin and Polyvinylpyrrolidone(PVP) against pathogenic bacteria in catheters.

Methods: Minimum inhibitory concentration (MIC) values of dextran, gentamycin and Polyvinylpyrrolidone(PVP) were determined against bacteria isolated from catheters. Antibiofilm effect of biopolymer dextran and its blenders (gentamycin – PVP) was determined alone and as blends (dextran- gentamycin), (dextran-PVP), (dextran - gentamycin -PVP) using a pre-coated method in micro titer plate and catheters.

Results:The MIC of dextran was found to be 32mg/ml for *E.coli* , *P.aeruginosa* , *S.aureus* isolates , the MIC for *P.mirabilis* isolates was between (16 –32) mg/ml while in *S.epidermidis* was between (32 – 64)mg/ml. The MIC of gentamycin, PVP was found to be 16 µg/ml, 256 mg/ml respectively for all bacterial isolates. Biopolymer blend had the ability to inhibit biofilm formation in micro titer plate and catheters, the highest biofilm inhibition ratio 80% was recorded of biopolymer dextran - gentamycin –PVP blend against *S.epidermidis*(Se₁) in microtiterplate, while in catheters the same biopolymer blend had antibiofilm effect with biofilm inhibition ratio reached to 90% and 81% against *E.coli*(E₂) and *S. aureus*(Sa₂) respectively after 72h.

Conclusion: The biopolymer dextran- gentamycin – PVP blend had antibiofilm properties against pathogenic bacteria isolated from catheters. Also had a potential to be used as antibiofilm coating for catheters.

Keywords : Dextran, Polyvinylpyrrolidone, Gentamycin, Antibiofilm, Catheter.