ABSTRACT ID: 28
Oral

Antibiotic Susceptibility Study Of Metal-Gentamicin Complexes Against *Staphylococcus Aureus* Biofilms

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Introduction: Dental plaque is a structurally and functionally organized biofilm. Modern molecular biological techniques have identified about 1000 different bacterial species in the dental biofilm, twice as many as can be cultured. Inherent resistance of biofilm bacteria to conventional antibiotics is alarming. It induces antibiotic resistance to an order of three or more in magnitude greater than those displayed by planktonic bacteria. *Staphylococcus aureus* is the most dominant bacterial species isolated from the saliva and dental plaques. One of the reasons for its pathogenicity is its ability to form biofilms. In this study, the resistance of *S. aureus* biofilms against a eries of metal-antibiotics, an alternative to the conventional antibiotics, was investigated. **Materials and Methods:** A series of metal-antibiotic complexes derived from gentamicin was synthesized to give metal-gentamicin complexes. The metal contents of all the compounds were determined using Atomic Absorption Spectroscopy (AAS). Antibiotic susceptibility testing of the gentamicin-antibiotic complexes against several strains of *S. aureus* biofilms was conducted using broth microdilution assay. **Results:** The results showed that *S. aureus* is susceptible against Co(II) and Fe(II) gentamicin complexes; all were tested at 0.25 to 1 mmol concentrations. **Conclusion(s):** Co(II) and Fe(II)-gentamicin complexes demonstrated antimicrobial activity.

KEYWORDS: antibiotic resistance, biofilms, *Staphylococcus aureus,* metal-antibiotics complexes