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Title – Isolation and Antimicrobial Susceptibility of *Pseudomonas aeruginosa* Associated with Suction Tubes and Waterlines at Dental Clinics in Benghazi City

Abstract

Introduction: Bacterial biofilm including *Pseudomonas aeruginosa* (opportunistic hospital pathogen) in dental unit waterlines and evacuation system has become a global concern because they represent a life threatening risks specially among immunocompromised patients as well as dental staff. *Pseudomonas aeruginosa* is frequently found as the leading cause of waterline contaminant in the dental clinics. In addition, data of identified bacterial species , particularly *Pseudomonas aeruginosa*, among dental units in Benghazi-Libya is sparse.

Objectives: To investigate the presence of *Pseudomonas aeruginosa* in waterlines and suction tubes among Benghazi dental clinics as well as determination the sensitivity testing of isolated bacteria with commonly used antibiotics

Methods: A total of 196 sample were collected from different dental clinics in Benghazi (two teaching clinic, one private and one public). Selected units checked for the presence of *P. aeruginosa* in the dental chair are suction tubes and waterlines. Suspected *Pseudomonas* isolates were identified using universal biochemical tests and positive samples were preserved for sensitivity test.

Results: A total of 196 samples were collected from private, teaching and public clinics, each sample consists from water line and suction tube swabs. All swabs were examined for presence of *P. Aeruginosa*. From the 115 water samples and suction tube swabs from teaching dental clinic (42.60%) *P. aeruginosa* strains were isolated: 18 (15.65%) from water line and 31 (26.95%) from suction tube swabs. Among the public clinics, 51 sample were collected, (29.41%) *P. aeruginosa* strains were isolated: 15 (29.41%) from suction tube swabs and no growth were detected from the water lines. Although, 30 samples from the private dental clinics were examined for the presence of *P. aeruginosa* the growth were detected in 5 (16.66%) and it was all from the water lines, and no growth were detected from the suction tubes swabs. Regarding antibiotic sensitivity, significantly, all the isolates were multidrug resistant. Ciprofloxacin showed the most sensitive antibiotic (80%-100%) among tested antibiotics while doxycycline exhibited the most resistant antibiotic (60%-100%).

Conclusion: Although the percentage of *P. aeruginosa* being detected is considered low in this study, further sterilization precaution needs to face such multidrug resistant nosocomial pathogen among dental clinics in Benghazi.

LEARNING POINTS/TAKE HOME MESSAGES

- 3 to 5 bullet points
1. More sterilization measures should be taken by all dental clinics in Benghazi to reduce the risk of transmission of microbial pathogen from dental chairs.
2. Increasing the samples collected to include more surfaces in the dental clinics.
3. Increasing the varieties of the antibiotic agents in continuing studies.
4. Further studies need in sterilisation area in Benghazi dental clinics on different pathogens.
5. Determination the most effective infection control protocols to be followed in Benghazi city.