

Infection Control in The Dental Clinics: Probiotic-Based Cleaning as an Alternative to Chemical Disinfection



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Background and Purpose: Chemical disinfectants have many adverse health effects, especially on those exposed to them very frequently. They can also enhance the selection of antibiotic resistant strains. We aim to assess the antibacterial effectiveness of probiotic cleaning compared to chemical disinfectants in a dental clinic at the University Dental Hospital Sharjah (UDHS), UAE.

Methodology: The current cleaning protocol of UDHS was evaluated by swabbing of 11 surfaces in 3 dental clinics cleaned using regular chemical disinfectants. A new probiotic solution containing *Bacillus subtilis* was applied for 3 weeks in a selected clinic. Bacteria were grown onto selective culture media for colony counting from surfaces cleaned with the probiotic solution compared to those obtained from the same surfaces cleaned with the regular chemical solutions. Isolates identity was confirmed by biochemical tests or PCR. Isolates were tested for antibiotic resistance.

Results and Discussions: Probiotic-based sanitation had stronger effect on surface pathogens compared to conventional disinfectants. Bacterial counts of *Staphylococci*, *Streptococci* and Gram-negative rods were significantly reduced from almost all the surfaces in the dental clinic. *Bacillus subtilis* replaced the pathogenic bacteria by competing with them for space and nutrition. However, probiotic cleaning had non-significant effect on antibiotic resistance rates after 3 weeks of application. This effect may be more evident after longer duration of application.

Conclusions: Probiotic cleaning was effective in limiting bacterial growth in different parts of the dental clinic. They are eco-friendly; thus, they can reduce the exposure to chemical disinfectants and will reduce the selection of resistant bacteria. This approach may be tested further to examine the long-term effect and to evaluate the opportunity of applying this novel biotechnology as part of the infection control routine in dental settings instead of the chemical disinfectants. This is the first study testing the application of probiotic-based sanitizers in dental settings.

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Local Varieties of *Allium Sativum* Has More Effective Antimicrobial Property Compared to Imported Variety



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Natural antibiotics or commonly known as herbal plants are used against various small diseases throughout the history of mankind. Now we use synthetic antibiotics. However, these antibiotics are very much ineffective against various microorganisms because of the antibiotic resistance. In current work we used Bangladeshi and hybrid garlic against *Vibrio cholerae*, *Staphylococcus aureus*, *Bacillus cereus* and *Streptococcus pyogenes*.

The garlic samples were dried and ethanolic and methanolic extract were prepared following a previously published protocol. The extracts were diluted by Dimethyl sulfoxide and Distilled water at 75%, 50% and 25% for conducting agar diffusion tests. The prepared extracts were tested on microorganisms by using minimal bactericidal concentration of garlic extract. Further, agar well

diffusion test were performed in order to determine the zone of inhibition. For determine the qualitative analysis of the phytochemical properties of Bangladeshi and hybrid garlic, we did basic phytochemical screening tests.

Bangladeshi variety of garlic showed MBC of 62.5%, 67.5%, 52.5%, and 65% against *Vibrio cholerae*, *Staphylococcus aureus*, *Bacillus cereus* and *Streptococcus pyogenes* respectively where as MBC of 70%, 75%, 70%, and 70% was found for the hybrid variety against the same organisms. The average diameters of inhibition-zone were 11 mm, 12.5 mm, 21.5 mm and 18.65 mm against *Vibrio cholerae*, *Staphylococcus aureus*, *Bacillus cereus* and *Streptococcus pyogenes* respectively while the same for hybrid variety were 8 mm, 6 mm, 20.67 mm, and 7 mm. These results suggest that the local variety might be more effective against the bacteria tested in this study. The phytochemical test result shows that Bangladeshi Garlic contains proteins, tannins and phenols, alkaloids and triterpenoids on the other hand hybrid garlic has proteins and alkaloids but triterpenoids was absent.

Overall, the result shows that Bangladeshi garlic might be more effective against microorganisms and it can act as a stepping stone to use garlic for therapeutic purposes.

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Clinical Presentations and Pathogenic Agents of Bloody Diarrhoea among Iraqi Children



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Diarrhea is the second leading cause of child morbidity and mortality, especially in the developing countries. A Cross-sectional study was conducted with the objectives of determining the clinical features and pathogenic agents caused bloody diarrhea among Iraqi children. Random sample of 1500 children age less than or equal to 10 years old having diarrhea were participated in this study. Stool samples were examined by divided each one into two portions, one portion used for direct general examination while the other was cultured for the detection the causative. The prevalence of childhood bloody diarrhea was 28%. *Entamoeba histolytica* infected all age groups with highest (97.5%), and lowest (20%) prevalence among age groups 1-3 years and 4-6 years old respectively. *Salmonella* and *Shigella* were found, 42.1%, 15.8% respectively more among the age group 4-6 years, 42.1%, 15.8% respectively. In conclusion, the prevalence of bloody diarrhea among children less than 10 years of age presenting with diarrhea in Baghdad is (28%). However, *Entamoeba histolytica* is the commonest and most frequent causative agent of bloody diarrhea in children. Moreover, fever, tenesmus, severe dehydration and convulsion were the significant characteristics of bloody diarrhea among Iraqi children.

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