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Bacterial contamination of used manual toothbrushes and effects of toothpastes on isolated potential pathogens

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Toothbrushes play an essential role in oral hygiene and are commonly found in community and hospital settings. The toothbrushes may act as a reservoir for potential pathogens transferred from the oral cavity and from the bathroom environment. The purpose of this study is to determine the bacterial contamination of used toothbrushes and determine the antibacterial effect of toothpastes. Scanning electron microscopy (SEM) was used to visualize biofilms on toothbrush bristles. 50 used toothbrushes obtained from volunteers were analyzed bacteriologically using standard microbiological techniques. Bacteria present on all toothbrushes heads were cultured to determine the presence of bacteria and scanned by SEM. The antibacterial effect of toothpastes was determined using seven types of commercial toothpastes and chlorhexidine toothpaste by inoculation bacteria on the toothpaste plates. The result showed that all the toothbrushes were contaminated with the following bacteria: *Roseomonas mucosa, Stenotrophomonas maltophilia, Pseudomonas aeruginosa, Leclercia adecarboxylata, Enterobacter asburiae, Candidatus Roseomonas massiliae, Pseudomonas parafulva, Bacillus licheniformis, Pseudomonas aeruginosa, Agrobacterium larrymoorei, Pantoea septica, Stenotrophomomnas rhizophila, Citrobacter freundii* and *Pseudomonas frederiksbergensis*. The bristle surfaces, being rough, provided ample sites for trapping organisms. Examination of a brush revealed a biofilm on the brush head. The biofilm seen on the surface of the head to be composed of a compacted mixed community of microorganisms, including cocci, bacilli and filamentous organisms, together with cellular and debris. The toothpaste used proved antibacterial and inhibited bacterial growth, based mainly in the activity of fluoride which is widely used as an effective anticaries agent. In conclusion the isolated organisms are potentially pathogenic, particularly in relation to immunocompromised patients. The appropriate rinsing and drying of the toothbrushes before storage will however, likely reduce the incidence of these bacteria and the health risk associated with these pathogens.

Biography

Rana Abdulrahim Alaeq is currently a PhD student in Department of Molecular Biology and Biotechnology, University of Sheffield, UK, under the supervision by Prof. (Hon. Cardiff) Milton Wainwright. In 2004, he was awarded Master of Microbiology, Faculty of Science in Taibah University and Master of Medical Microbiology, Faculty of Biology, Medicine and Health in University of Manchester in 2013. He has worked as a Teacher Assistant in Department of Medical Laboratory Technology, Faculty of Applied Medical Sciences, Taibah University and also cooperated in the educational laboratories of the Department of Medical Laboratory Technology like medical microbiology, medical parasitology and medical virology.

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