Scientific

Microbial contamination of dental unit water systems

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Precis

A study of water and tubing samples from dental practices revealed microbial loads that exceeded the European guidelines for drinking water in many cases.

Abstract

Introduction: dental unit water systems (DUWS) may serve as a reservoir for biofilms that contribute to high numbers of bacteria in the water used during dental treatment. These microbes are predominantly harmless but potentially pathogenic organisms can also be present in the biofilm. This may pose a potential health risk for patients and dental personnel.

Aim: to determine the microbial levels of DUWS in dental practices.

Materials and method: a cross-sectional study of water and tubing samples from 30 general dental practices (15 health board and 15 private surgeries) was undertaken as part of a pan-European investigation of the microbial qualitative and quantitative aspects of DUWS.

Results: microbial loads ranged from 100 to 104 cfu ml-1 and exceeded the European guidelines for drinking water in many cases. The available evidence suggested the presence of isolates most likely belonging to families of aquatic and soil bacteria. It was not possible to draw distinct conclusions correlating microbial loads with dental unit parameters, including age of the unit, water source and chemistry and presence or absence of anti-retraction devices. Opportunistic or true pathogens were not detected. Yeasts were observed in samples from three units although further analysis confirmed that these were not Candida albicans. A decontamination strategy applied to one of the units eliminated the yeasts completely.

Conclusions: dental practitioners must be knowledgeable regarding microbial contamination and biofilm formation in dental unit waterlines. There is a need for development of European evidence-based guidelines and reliable control regimes for microbial contamination of DUWS.

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