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Editorial

Dentists Take Heed, Non Tuberculous *Mycobacteria* May be Lurking in Dental Waterlines which can be a Potential Cause of Pulmonary NTM Infections in Immunocompromised Patients

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Quotation

"Waterlines connecting the various instruments need to be disposable or sterilized before use on a patient. This would be a benefit, since the point of use contamination would be easily controlled. The installation would include a filter which would be utilized in combination with changes of tubing between patients".

The presence of Non-Tuberculous *Mycobacteria* (NTM) related pulmonary infections have been reported in many countries as opportunistic pathogens in both immunocompromised (AIDS, COPD, Cancer Patients, Organ Transplant Recipients, etc.) and immuno-competent patients [1-3]. The NTM Mycobacterial pathogens that have been most frequently isolated in patients were: *Mycobacterium avium, Mycobacterium Kansasii and Mycobacterium abscessus* [1-3].

These NTM *Mycobacteria* have also been found in the water systems of hospitals, hemodialysis centers and dental offices [2].

These organisms have been commonly found in drinking water and have are frequently seen as biofilms coating household plumbing and water supply piping [1,3].

Pankhurst reported that NTM *Mycobacteria* can be amplified in biofilms such that they reach infection concentrations with the potential for inhalation of direct contamination of surgical wounds [4]. The investigation of Pankhurst also stated that, "The major source of organisms is environmental and derives from the incoming mains water" [4]. This investigator further stated that "Dental Unit Water Lines and surgery plumbing act as a reservoir of continuing infection" [4].

Pankhurst further stated that "contamination in a dental unit can also be acquired as retrograde flow from the oral cavity" [4]. This author additionally states that the major route of transmission of these pathogens is the result of "aerosolisation" of the dental unit water via a dental handpiece [4]. Pankhurst additionally states that, "dental handpieces generate 5µm particles which are large enough to transport microbes" [4]. The air turbines can generate aerosols that much higher than aerosols generated by conventional handpieces [4]. All these facts taken must be now considered especially when a dentist in the Twenty-First Century is now routinely treating patients whose immune system is impaired. The practitioner of today is thus treating normal, as well as, immuno-impaired, and immunocompromised patient populations [4].

The CDC has cited the fact that dental unit waterlines are narrow bore plastic tubing that carries water to the high speed handpiece, air or water syringe, and ultrasonic scaler which can become colonized with microorganisms [5]. The CDC further states that, "Dental waterlines factors- such as system design, flow rates and materials-promote both bacterial growth and development of biofilms" [5]. The CDC cites the fact that infection or colonization by NTM *Mycobacteria* can occur through direct contact with water or after exposure to contaminated instruments [5]. In addition, the CDC states that NTM *Mycobacteria* can also be transmitted by inhalation of tap water aerosols [5].

Dentists have done far "too little" to address the problem of NTM Mycobacterial biofilm formation in water lines. This has been due in part to lack of interest among dentists in the problem, and the lack of products in the marketplace that would be suitable for use in a dental office [4-7]. Filters and non-retraction valves offer little to the practitioner to use in a problem which has received little publicity urgency [4]. There needs to be a realization that the problem can manifest in a growing elderly or immuno-compromised patient populations. Without external pressure, little progress in this area of focus will ever happen!!

A system using filters seems at the onset of being an effective means of control [7]. Filters can be wrought with problems, such as maintenance at prescribed intervals. Damage to the filter, lessening its effectiveness in preventing biofilm formation. Due to the "suck back" present in the handpieces, water syringe and tooth cleaning instruments that rely on water for cooling or delivery, there is an inherent problem with biofilm formation at the point of use [4]. Chemical agents have been tried, however, biofilm growth starts soon after they are used, thus making them ineffective [4,7].

Singh et al have stated that, "Enhanced national dental water quality standards are needed to prevent future outbreaks" of NTM Mycobacterial Infections associated with Dental procedures [8]. NTM Mycobacterial Dental related infections are of special importance when dealing with the elderly, immuno-compromised, and COPD patient populations where Dental Waterline Contamination can potentially lead to life threatening pulmonary NTM Mycobacterial Infections [2].

Dental Waterline NTM *Mycobacteria* contamination needs to be eliminated [2-8]. The waterlines connecting the various instruments need to be disposable or sterilized before use on a patient. This would be a benefit, since the point of use contamination could be easily controlled. The installation would include a filter which would be utilized in combination with changes of tubing between patients.

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