

Title: ENVIRONMENTAL MICROBIOLOGICAL INVESTIGATION OF AN OPHTHAMOLOGY CLINIC DURING AN OUTBREAK OF MYCOBACTERIAL INFECTIONS AFTER LASER IN SITU KERATOMILEUSIS

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Abstract:

Microbial keratitis is a serious and potentially vision-threatening complication of refractive eye surgeries, as laser in situ keratomileusis (LASIK). Although considered a rare complication, the number of single case and outbreak reports of post-LASIK keratitis caused by several species of bacteria and fungi is increasing. To investigate putative source(s) of infection of an outbreak of mycobacterial infections after LASIK, an environmental microbiological investigation was performed in the laser center facility. Anesthetic and povidone iodine solutions, tap water, distilled water from a storage tank, from a cassette autoclave and from the reservoir of a portable steamer were collected, concentrated and either cultivated on blood agar or decontaminated and plated on Middlebrook 7H10-OADC agar, 7H10-OADC-Panta and Löwenstein-Jensen solid medium. Cannulas and blades were cultivated in liquid Middlebrook 7H9-OADC medium. Imprints of the microkeratome and other surgical instruments were made on 7H10-OADC agar plates. Cultures of acid-fast bacilli were identified by PCR_Restriction Enzyme Analysis of the *hsp65* gene (PRA-*hsp65*). BD Phoenix Automated Microbiology System was used for identification of non acid-fast microorganisms. Several organisms, including potential etiologic agents of ocular keratitis were isolated and identified. *Mycobacterium chelonae* was isolated from the distilled water tank and from the steamer reservoir; *Mycobacterium mucogenicum* from tap water; *Methylobacterium extorquens* from the distilled water tank and from microkeratome rings; *Burkholderia cepacia* and *Candida guilhermondii* from distilled water of the steamer reservoir and the cassette autoclave. *Sphingomonas paucimobilis*, *Burkholderia gladioli* and *Kingella kingae* were isolated from the cassette autoclave, from the steamer reservoir and from microkeratome rings, respectively. No microorganisms were isolated from anesthetic and povidone iodine solutions, cannulas or microkeratome blades. In this clinic, tap water was distilled and stored in non-sterile tanks. The stored distilled water was used to rinse surgical instruments and to fill the reservoirs of the cassette autoclave and the portable steamer, both used for surgical instruments sanitization. The results indicate that distilled tap water used for sanitization of surgical instruments in a laser center facility can be a potential source of contamination and post-LASIK microbial keratitis.

Keywords: LASIK, microbial keratitis, *Mycobacterium*, outbreaks

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