Infection risk from surgeons’ eyeglasses

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ABSTRACT

Purpose. To assess bacterial contamination of 20 eyeglasses from surgeons.
Methods. 40 samples were taken from the nose pad (n=20) and earpiece (n=20) of 20 eyeglasses from orthopaedic surgeons using a sterile swab stick soaked in sterile distilled water. Swabs were incubated and inoculated onto 3 plates: Staphylococcus/Streptococcus agar plate, Mannitol salt plate, and Chromogenic agar plate. Organisms isolated were identified.
Results. Of 20 eyeglasses, 19 were contaminated with Staphylococcus epidermidis (3 of them additionally grew S haemolyticus or S xylosus) and the remaining one grew S aureus.
Conclusion. Eyeglasses are a source of surgical infection. Contamination can be caused by direct contact of the eyeglasses to the wound and indirect contact by the surgeon’s fingers, splashes from saline irrigation, and through air. Therefore, disinfection should be performed for eyeglasses of surgeons. The use of surgical visor masks or filtered exhaust helmets (space suits) are alternatives.

Key words: arthroplasty; eyeglasses; infection control; Staphylococcus epidermidis; surgical wound infection

INTRODUCTION

Deep infection is a devastating complication that increases the burden of the health care system.2 Prior to introduction of the laminar system, the deep infection rate was 3.4% and primarily associated with skin commensals.3 Scrub staff are mandated to wear occlusive clothing under the laminar flow to reduce the infection rate. Nonetheless, bacterial loading can arise from other sources, either from patients endogenously or from unsterile equipment, drapes, gowns, or gloves.4 5 The exposed facial area is a source of infection even if surgical visor masks are worn.6

It is a usual practice for surgeons to tape the frame of eyeglasses to the nose or temples to avoid their slipping. Contamination may be caused when eyeglasses drop on the sterilised instruments or
the open wound or through air-borne infection. We assessed bacterial contamination of 20 eyeglasses from surgeons.

MATERIALS AND METHODS

Between 16 and 23 November 2010, 40 samples were taken from the nose pad (n=20) and earpiece (n=20) of 20 eyeglasses from orthopaedic surgeons using a sterile swab stick soaked in sterile distilled water. Each sample was processed separately. On day one, each swab was placed into a broth and incubated for 24 hours at 36°C. On day 2, the broth was inoculated onto 3 plates: Staphylococcus/Streptococcus agar plate, Mannitol salt plate, and Chromogenic agar plate. These plates were incubated at 36°C aerobically for 24 hours. Mannitol salt and Chromogenic agar plates were read once more at 48 hours. Organisms isolated were identified and saved using storage beads.

RESULTS

Of 20 eyeglasses, 19 were contaminated with Staphylococcus epidermidis (3 of them additionally grew S haemolyticus or S xylosus) and the remaining one grew S aureus. None of the eyeglasses was dropped or touched by surgeons’ hands during surgery.

DISCUSSION

Infections following joint arthroplasty remain a problem despite the use of antibiotics and identifying the sources of bacterial contamination.7 In laminar flow theatres, air-borne contamination can be reduced significantly when the occlusive gowns, hats, and masks are worn.8,9 The facial area of scrub staff is a source of contamination in laminar airflow theatres, and thus the use of exhaust helmets is recommend.10 Wearing of surgical (safety) eyeglasses reduces the risk of eye splash injuries to surgeons.

As a normal skin commensal, S epidermidis is a contaminant rather than a pathogen. Nonetheless, it is a leading cause of nosocomial infections.11 The risk of S epidermidis bacteraemia is high in neonates, patients undergoing chemotherapy, and those with in-dwelling medical devices.12–14 Formation of biofilms on plastic devices is a major virulence factor for S epidermidis, as surface proteins bind blood and extracellular matrix proteins. The organism’s capsule, known as polysaccharide intercellular adhesion layer, is made up of sulphated polysaccharide. It enables other bacteria to bind to the already existing biofilm, creating a multilayer-biofilm. Such biofilms decrease the metabolic activity of bacteria within them. This decreased metabolism, in combination with impaired diffusion of antibiotics, decreases the effectiveness of antibiotics. Therefore, the most efficient treatment for these infections is to remove or replace the involved implant.15 This phenomenon most commonly occurs on intravenous catheters and on in-dwelling medical devices.16,17 S epidermidis is the leading cause of orthopaedic prosthetic device infections.18 Prosthesis removal is devastating; hence all attempts should be made to prevent infection.

In our study, eyeglasses are a source of surgical infection, harbouring considerable skin flora. Contamination can be caused by falling of the eyeglasses directly onto the wound, touching of the eyeglasses accidentally by surgeons during operation, or by splashes (from saline irrigation) hitting the eyeglasses and falling back into the wound. Moreover, eyeglasses can cause air-borne infection through the laminar airflow system in operating theatres. Therefore, disinfection should be performed for eyeglasses of surgeons. The use of surgical visor masks or filtered exhaust helmets (space suits) are alternatives.

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REFERENCES