Contamination of Laryngoscope Handles

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Introduction

Despite use of sterile or disposable laryngoscope blades for each patient, disinfection of laryngoscope blades does not routinely occur [1]. Handles may be contaminated by splashes and contact with surfaces or the hands of the anaesthetist [2,3]. Laryngoscope handles are typically knurled to provide a good grip, however the fissures in this surface may harbour pathogens [4]. After making contact with the patient’s oropharynx, the tip of the blade usually makes contact with an area on the lower third of the handle when folded after use (see inset) [2-3]. These devices therefore present a number of potential mechanisms for transmission of pathogens between patients and staff. 

Methods

Specimens collected from 64 laryngoscope handles which were deemed to be “ready for patient use” were assessed semi-quantitatively for bacterial contamination. Further identification of all isolates by routine methods and a MicroflexTM LT MALDI-TOF mass spectrometer was performed.

Samples were taken from 3 sites on each laryngoscope handle:
- Site A: Side of hook mount (smooth)
- Site B: Upper third of handle (knurled)
- Site C: Contact point on lower third of handle (knurled)

Additional samples were also taken from sites B and C of the first 50 laryngoscope handles and tested for occult blood contamination using Hemascreen® sensitisation cards.

Results

- One or more species of bacteria were isolated from 61 (86%) of the handles. These included the potential pathogens Enterococci, meticillin-sensitive Staphylococcus aureus, Klebsiella and Acinetobacter. The cultures did not yield any anaerobes, fungi, meticillin-resistant Staphylococcus aureus, vancomycin resistant enterococci or multiresistant gram negative bacilli.
- 192 samples yielded 130 positive cultures, of which Site A: 33 (25%); Site B: 44 (34%); Site C: 53 (41%).
- Site C was the only site to demonstrate heavy contamination, and the only site from which Streptococcus viridans were isolated.
- No occult blood contamination was found at a concentration of >0.6mg/g on any of the sites tested.

Discussion

- Contamination with aerobic bacteria was demonstrated on the majority of laryngoscope handles studied.
- Although the majority of organisms isolated were not pathogenic, certain species could be harmful in immunocompromised patients, and presence of these organisms indicates that pathogenic organisms, if present, could potentially be transmitted by the same mechanisms.
- A greater range of species and heavier growth were found on knurled surfaces (B,C) compared with smooth surfaces (A).
- A greater range of species (including oral flora) and heavier growth were found at the contact point where the tip of the laryngoscope blade made contact with the handle (C) compared with other knurled surfaces (B), highlighting this as a potential route for transmission of infection between patients.

Conclusions

- Laryngoscope handles present a potential route for transmission of infection.
- Strategies to address this include: revision of procedures for disinfection and storage prior to use, introduction of disposable handles or sheaths, and re-design of handles to eliminate knurled surfaces and contact points.

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References