

Laryngoscope decontamination techniques: A survey

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Abstract

Background and Aims: India is a vast country with variable, nonuniform healthcare practices. A laryngoscope is an important tool during general anesthesia and resuscitation. The study aimed to determine the current practices of laryngoscope decontamination in India.

Material and Methods: An online survey was conducted amongst 100 anesthesiologists to determine the common methods of laryngoscope decontamination adopted in their settings. The survey was done over 6 months after validating the questionnaire.

Results: A total of 73 responses were received out of 100. The result of the survey revealed that there is no uniform technique of laryngoscope decontamination. There is marked variability in techniques followed not only among different institutions, but also within the same institution.

Conclusion: There are no fixed protocols adopted for laryngoscope decontamination. Thus, there is a need to develop definitive guidelines on this subject, which can be implemented in India.

Key words: Decontamination, India, laryngoscopes

Introduction

A laryngoscope is one of the basic and indispensable equipment. Laryngoscopy is an invasive procedure involving contact of the laryngoscope with the mucous membrane, saliva and at times even blood. Laryngoscope blade and handle have been reported to harbor micro-organisms and occult blood making them a potential source of hospital-acquired infection (HAI).^[1] While, infection control in anesthesia is an issue of concern,^[2] the role of the laryngoscope in the spread of infection is often not well appreciated by practicing anesthesiologists.

Review of the literature reveals that though various attempts have been made to disinfect the laryngoscope, the reprocessing

practices are seen to vary significantly from one healthcare facility to another.^[3,4] The guidelines which exist are incomplete, inconsistent, and inadequate, and there is a lack of consensus.^[5] India is a vast country with variable, nonuniform healthcare practices, and there are no well-defined guidelines available till date on techniques of laryngoscope decontamination. The present survey aims to determine common practices used for laryngoscope decontamination by our anesthesiologists.

Material and Methods

An online survey using Google forms was conducted in 45 institutions to determine the prevailing practice of laryngoscope decontamination in their hospitals. The survey was sent to 100 anesthesiologists from 37 leading tertiary care centers of the country. The anesthesiologists were selected equally

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from each hospital so that there is uniformity in reporting. A questionnaire of 14 questions was prepared based on reported practices of decontamination and previous studies^[4,6,7] on the subject. The questionnaire was initially sent to five anesthesiologists who were not involved in the survey. After taking their opinion on the format of questions and making necessary changes, it was again sent to a new set of five anesthesiologists. Once, no further correction was required, the final survey was sent to 100 anesthesiologists, selected randomly from each hospital. The data were analyzed using frequency and percentage. The survey was conducted over 6 months from May to October 2013.

Results

A total of 73 responses were received out of 100. Sixty-four respondents had >10 years of experience while 7 respondents had 5-10 years and 2 had <5 years of experience after postgraduation.

Thirty-three anesthesiologists (45%) always wore gloves before laryngoscopy, while 16 (22%) admitted that they never wear gloves. All 73 respondents (100%) agreed that laryngoscope can be a source of HAI. Thirty of the 73 respondents (42%) would not use a randomly selected laryngoscope from their institution for personal use. Fifty-one out of 73 respondents (70%) have never used a disposable laryngoscope blade. Of the remaining 22 using disposable laryngoscopes, 8 respondents reused them after cleaning. Forty-six anesthesiologists (63%) acknowledged a well-defined protocol in their hospital [Figure 1]. However, on further evaluation, it was found that the anesthesiologists from the same hospital were following different protocols.

With regard to the cleaning and disinfection policies adopted in the institute, 29 respondents (40%) clean the laryngoscope blade after usage by initially washing with soap and then running tap water, whereas 23 respondents (32%) clean using brush with soap and water [Figure 2]. Forty anesthesiologists (54%) admitted that they do not disinfect laryngoscope blade, while only 16 (22%) put the used laryngoscope blade in the chemical disinfectant after cleaning [Figure 3]. Forty-three anesthesiologists (59%) informed that cleaning-disinfection technique is modified depending on the perceived risk of infection.

Sixty-seven respondents (92%) informed that OT technical staff is responsible for cleaning of laryngoscopes, but only 50 (68%) agree that the staff members responsible for cleaning the laryngoscope have been trained accordingly. Regarding

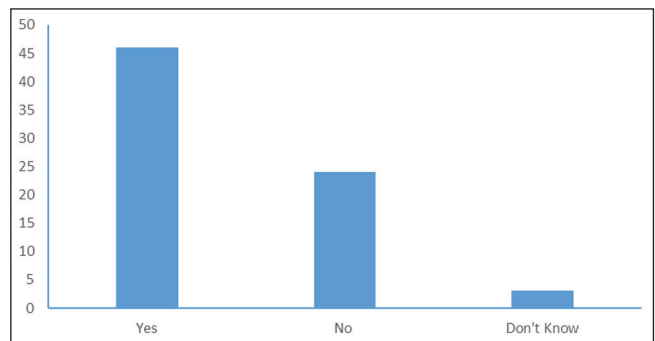


Figure 1: Protocol for cleaning/decontamination of laryngoscope blades

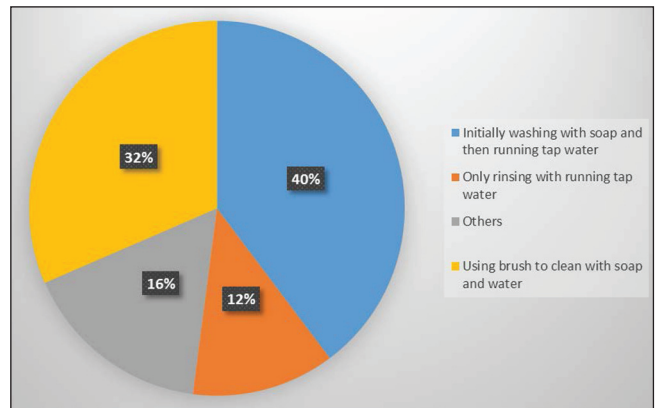


Figure 2: Techniques of cleaning laryngoscope blades

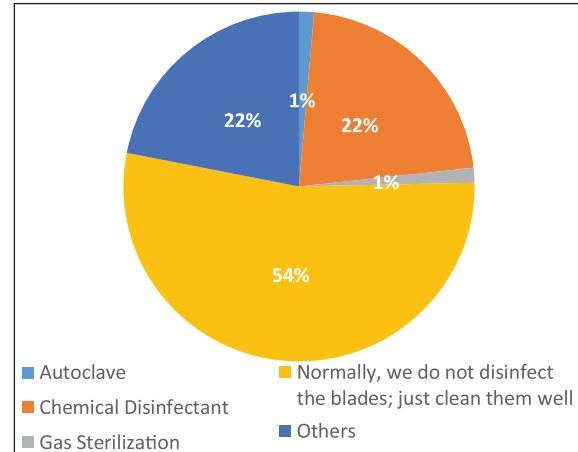


Figure 3: Techniques of disinfection of laryngoscope blades

laryngoscope handle, only 25 respondents (34%) clean it after every case. Rest 48 either do not clean it at all or do it once in a day at the start or end of operation theater [Figure 4]. There is no fixed way of handling the soiled laryngoscope blade after use: It is kept in the intubation tray (29), handed over to the technician (23), kept by the side of patient head (13), or on the machine (8). After decontamination, for placement of a clean laryngoscope, 52 respondents keep it in the sterile intubation tray for subsequent use while 21 keep it in the pouch/box supplied

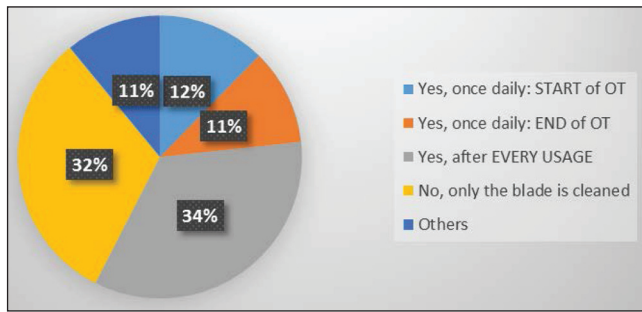


Figure 4: Techniques of cleaning/decontamination of laryngoscope handle

by the manufacturer, or in the drug tray or in the anesthesia machine drawer.

Discussion

Infection control in anesthesia is an issue of concern.^[2,8,9] However, the role of the laryngoscope in the spread of infection is often not well appreciated by its users. Moreover, there are studies which have shown the presence of visible or occult blood on the laryngoscope blade and handle making the equipment a potential source of cross-infection.^[10]

The laryngoscope blade which comes in direct contact with the patient mucosa in the oral cavity is often cleaned and decontaminated. In the present survey, 23 respondents (32%) do not clean the handle. Although the laryngoscope handle does not come into direct contact with the patient's oral mucosa, it is reported to get contaminated by the tip of the folded blade. Moreover, the handles usually have fissured surfaces that may harbor pathogens.^[11] Call *et al.* found high-level of bacterial contamination of laryngoscope handles despite low-level disinfection.^[12]

Literature reveals that various methods have been unsuccessfully tried to prevent the spread of infection associated with the laryngoscope contamination. These include the usage of sheaths^[13] and condoms^[14] to cover the blade and handle. According to Food and Drug Administration guidance document, use of a sheath to cover the laryngoscope does not eliminate reprocessing of its blade or handle.^[15]

There are various techniques of laryngoscope cleaning and decontamination reported in the literature.^[5,16] These include the use of use of chemical disinfectants (low-level and high-level), autoclaving, gamma radiation, gas sterilization, and plasma sterilization.^[17]

The results of our survey reveal that cleaning with soap and water with or without a brush is the commonest technique being followed by 52 respondents (72%). Forty anesthesiologists

(54%) admitted that use of disinfectant is not a common practice, and they do not disinfect the blade. Literature reveals that even if low-level disinfectants are used, they do not provide adequate decontamination.^[1,4]

Autoclaving is considered the gold standard for sterilization.^[18] Ideally both the laryngoscope handle and blade should be subjected to autoclaving. However, autoclaved laryngoscopes must have batteries replaced, be reassembled and checked for function prior to use, exposing them to repeated handling and thus potential contamination following sterilization.^[19] In the present survey, autoclaving of laryngoscope blade was performed by only 16 anesthesiologists (22%).

There are well-documented guidelines for decontamination of laryngoscopes in various countries.^[20-23] However, there are no such documented guidelines available in India from any professional organization.

Spaulding in 1968 had classified the patient care equipment as critical, semi-critical and noncritical based on the degree of risk of infection.^[20] All airway related equipment, since they come in direct contact with patient mucosa, are classified as semi-critical devices. Regulatory bodies like The Joint Commission (USA) emphasized the importance of standardizing the reprocessing and storage of the laryngoscope's blade and handle to reduce the risk of infection.^[9] Centre for Disease Control (CDC)^[20] and American Society of Anesthesiologists^[21] recommend cleaning and high-level disinfection or sterilization for the laryngoscopes.

The guidelines for decontamination and reprocessing of laryngoscope blade and handle had been described by Muscarella^[22] and California Department of Health Sciences.^[23] From the available literature, the steps for reprocessing can be summarized in a cyclical manner.^[24]

The ideal technique to prevent any laryngoscope associated infection would be the single use of a disposable laryngoscope. However, its use is not encouraged because of concerns about the efficiency of single-use blades during laryngoscopy in terms of significant increase in complication rate and increase time to intubate with disposable blades.^[16,25] Further, high cost and environment impact are also other deterrents.^[26] The result of the present study showed that 51 respondents (70%) had never used disposable blades. Amongst 22 who are using disposable blades, eight respondents are reusing it which is against the prescribed norms.

The result of this study revealed that there are no fixed practices, and there is marked variability in the techniques of handling used laryngoscope, cleaning, decontamination, and subsequent storage.

Conclusion

The present survey reveals that the laryngoscope is accepted to be a potential source of infection by all the respondents, and it should be free from contamination prior to use. Disruption at any of the step of reprocessing of the laryngoscope would amount to compromising patient safety. There is imminent need to develop the guidelines for laryngoscope decontamination in the interest of patient care which can be implemented in India.

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Conflicts of interest

There are no conflicts of interest.

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