

Survey of Elective Laryngeal Mask Airway Use in the Presence of Gastroesophageal Reflux Disease

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Abstract: Concern exists about the potential risks of pulmonary aspiration with the laryngeal mask airway (LMA) due to its inability to provide a tight seal at the larynx. The safety of LMA use in the presence of gastroesophageal reflux disease (GERD) is unclear, as GERD is presumed to increase the risk of aspiration under anesthesia. VA Anesthesiologists were surveyed regarding their practices in the setting of mild, moderately severe and severe symptoms of GERD. Approximately half responded that they would use a standard LMA in a patient with GERD as long as symptoms are mild. Nineteen percent would not use the LMA in any patient with a history of GERD.

Keywords: Laryngeal Mask Airway (LMA), Gastroesophageal Reflux Disease (GERD), Survey, Pulmonary Aspiration, General Anesthesia.

INTRODUCTION

Since it became commercially available in 1988, the Laryngeal Mask Airway (LMA) has become an extremely popular supraglottic airway device with over 200 million patient uses worldwide [1]. A drawback of the Classic LMA is that it does not provide a tight seal at the larynx and several case reports of aspiration have appeared in the literature [2]. Clinically detectable regurgitation with LMA use has been reported as 8.9 per 10,000 cases [3], while the incidence of aspiration, though unknown, has been suggested to be 2.3 per 10,000 cases based on data from prospective surveys [4]. The overall incidence of aspiration related to general anesthesia has been reported as 1.4-6.5 per 10,000 cases [4].

Gastroesophageal reflux disease (GERD) symptoms are frequently reported by surgical patients. The incidence of GERD in Western Europe and North America has been reported to be 10-20% [5], however, the true incidence of GERD in the general population is difficult to quantify, as large numbers of patients use over-the-counter medications to control their symptoms. The 2006 global consensus definition of GERD is: "a condition which develops when the reflux of stomach contents causes troublesome symptoms and/or complications". Population based studies concluded that mild symptoms occurring 2 or more times per week or severe symptoms occurring one or more times per week were considered troublesome [5].

It has been suggested that GERD should be considered a risk factor for perioperative aspiration [6]. GERD has not been specified by the manufacturer of the LMA as a contraindication to its use and they state that clinical judgment

must be used to weigh the risk of regurgitation and aspiration against the potential benefit of establishing an airway [7].

In our experience, there appeared to be significant variations in practice among our colleagues, in the absence of evidence-based guidelines. An abstract from a 1998 survey of Australian Fellows of the Australian and New Zealand College of Anaesthetists reported that 57-73% of respondents would use the LMA in patients with a history of erosive esophagitis or hiatal hernia as long as the patient is symptom free [8]. No similar survey of US Anesthesiologists regarding LMA use was found in a MEDLINE search. With GERD so frequently encountered in surgical patients and with the huge popularity of the LMA, we hypothesized that a large number of anesthesiologists are willing to use a standard LMA in patients with a history of GERD, as long as the patients have mild or no symptoms. Anesthesiologists in the Veterans Affairs Healthcare System (VAHCS) were surveyed regarding the elective use of the LMA in patients who report a history of GERD, and what degree of symptoms affects their management choices.

Materials and Methodology

Following approval from the Miami VAHCS Human Studies Subcommittee, the link to a 14 question survey (Appendix 1) was emailed to 540 full-time Anesthesiologists in the VAHCS nationwide. Email addresses were derived from the VA payroll database. A reminder email was sent thirty days later, and follow-up phone calls were made to the VAHCS Anesthesiology Service Chiefs, to encourage participation.

To validate the reliability of the survey prior to distribution, the questions were sent to 21 practicing anesthesiologists, who completed the survey. The questions were resent two weeks later. A kappa statistic was used to analyze the reliability of each survey question. Reliability was noted to be fair to excellent on all questions.

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The survey data was tabulated as frequency and percentile of responses. The Chi-Square test was used to test for the association between responder characteristics and the use of LMAs. Analyses were performed with SAS 9.1 software.

Results

Of 540 emails sent, 239 responses were received (a 44% response rate). No change in the pattern of responses was seen after the follow-up email or calls. The reported use of LMAs in the presence of GERD was independent of geographical region (Fig. 1), years of experience or type of practice.

Fifty-three percent of respondents reported being primarily employed in an academic setting, 3% were primarily in private practice, 14% were in a mixed practice setting and 30% selected “Other” as their practice setting.

The largest subset of respondents (33.5%) had 10-20 years experience. Almost all (97.4%) use LMA’s. The largest group (42.5%) use LMA’s for 10-25% of all general anesthetics. Most (91%) never use LMA’s for laparoscopic intra-abdominal surgery, however 39.5% use LMA’s “sometimes” (or 25-49% of the time) for surgeries in the lithotomy position. Forty-four percent were unsure whether an LMA with the capability of gastric decompression, such as the LMA ProSeal™ or LMA Supreme™ decreases the risk of pulmonary aspiration in patients with a history of GERD whereas 23.1% believed they would.

Approximately half of respondents reported that 25-50% of their patients report GERD symptoms. Forty-nine per-

cent said that moderately severe heartburn or greater would prevent them from placing a standard LMA whereas 18.7% reported they would avoid a standard LMA in anyone reporting a history of GERD, regardless of symptom severity (Table 1). For general endotracheal anesthesia for elective surgery, 21.9% said they would use acid suppression or gastrointestinal (GI) prophylaxis for all patients with a history of GERD whereas 36.3% would give GI prophylaxis only in the presence of moderately severe symptoms or greater. With respect to GI prophylaxis prior to LMA placement, the responses were mixed: 18.7% would give prophylaxis to all patients, regardless of symptom severity, 20% for mild symptoms and greater, 24.8% for moderate symptoms and greater, and 11.3% only for severe symptoms.

Discussion

Our objective was to determine practice standards among VAHCS Anesthesiologists regarding LMA use in patients reporting GERD. Almost all the anesthesiologists surveyed use LMAs and approximately half find 25-50% of their patients report GERD symptoms. Among respondents, there was no clear majority view, however, the responses indicate that almost half of respondents (49%) would use an LMA in a patient with GERD as long as there are only mild symptoms, whereas about 19% of respondents would never use an LMA in any patient with GERD, regardless of symptom severity, presumably due to concerns regarding the risk of aspiration. Almost 17% reported that only severe GERD symptoms would prevent them from placing an LMA.

There is currently no gold standard for the diagnosis of GERD and an International Consensus Group agreed that the

In what region do you practice?

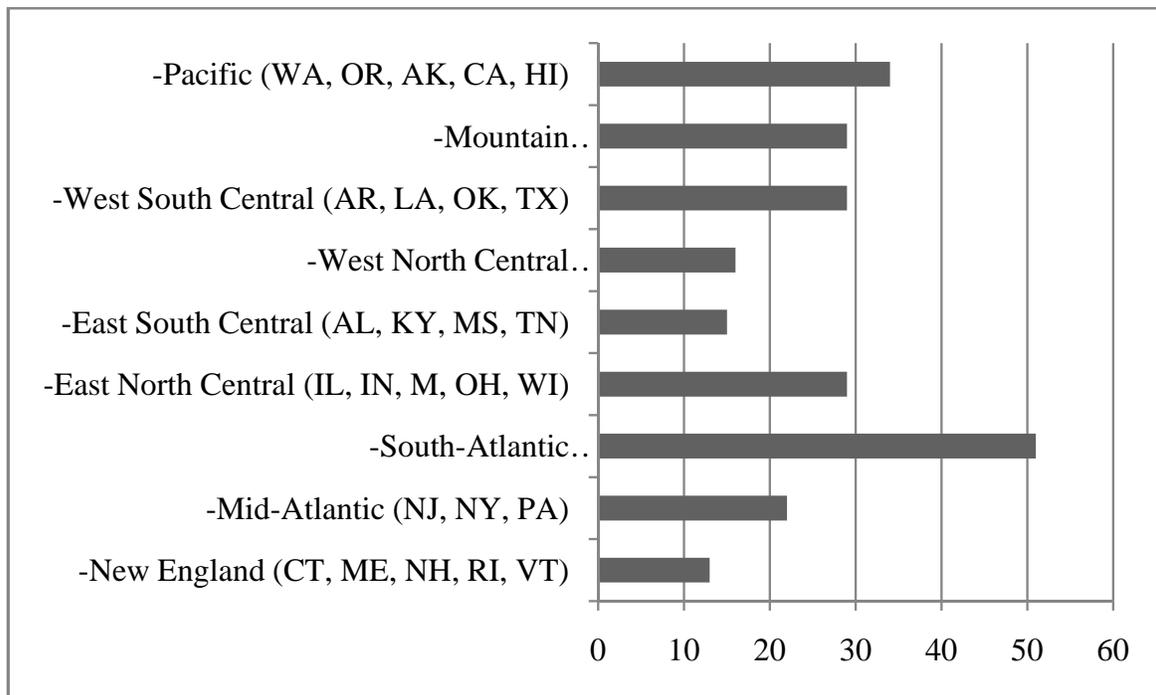


Fig. (1). Geographical region of respondents.

typical reflux syndrome may be diagnosed on the basis of characteristic symptoms without diagnostic tests [5]. Only 5% of patients who report symptoms to their physician are referred for endoscopy in a given year [9]. Heartburn frequency and intensity have been found to have a moderate correlation with the severity of mucosal injury seen on endoscopy, however they may not always accurately predict the degree of mucosal injury in individual patients [5].

Table 1. Responses to Question: What Degree of Severity of GERD Symptoms would Prevent you from Placing a Standard LMA?

	n (%)
Severe heartburn symptoms	39 (16.6)
Moderately severe heartburn Symptoms	115 (48.9)
Mild heartburn symptoms	37 (15.7)
All patients with a history of GERD even if currently asymptomatic	44 (18.7)

Although the incidence is unclear, a large proportion of patients who experience GERD symptoms are found to have endoscopy negative reflux disease (NERD) or functional dyspepsia [10]. It has been suggested that these patients may be abnormally sensitive to physiologic amounts of acid, or perhaps non-acid intra-esophageal stimuli trigger heartburn [10]. Conversely, elderly patients may have severe mucosal injury but no or decreased heartburn symptoms compared with younger patients [5, 11].

The International Consensus Group concluded that in clinical practice there is limited usefulness in arbitrary determinations of different categories of GERD severity based on frequency and duration and that the determination of how troublesome symptoms are should be patient-centered [5]. For these reasons, the questionnaire deliberately did not create specific definitions for categories of GERD severity, allowing respondents to report their typical practice choices based on the broad categories presented in the hypothetical clinical scenarios.

Episodes of reflux during general anesthesia with the LMA have been reported to be relatively frequent [3, 12, 13]. Despite this, the reported rates of aspiration associated with LMA use are very low and approximate the incidence of aspiration prior to its introduction [13]. Most studies investigating regurgitation and the LMA exclude patients who have a history of GERD, therefore the specific risks in this setting are unknown. A prospective randomized study comparing 5 supraglottic airway devices (including the LMA) or an endotracheal tube found no difference in the frequency of regurgitation episodes during positive pressure ventilation [14].

A history of GERD and the severity of symptoms may not necessarily be related to the degree or frequency of reflux episodes under anesthesia. One prospective survey examined the use of the LMA in 2,359 patients [15]; of these, 17 were reported to have a hiatal hernia. No regurgitation was reported in any of those 17 patients. A small pro-

spective study, investigating gastroesophageal reflux under anesthesia in 44 intubated patients, noted that a history of symptomatic esophagitis (n=5) was predictive of reflux in only 2 patients whereas 4 patients with no history of reflux esophagitis developed reflux [16].

One limitation of this study is the relatively low response rate (44%), which could have led to sampling bias. Some non-respondents contacted, reported that they felt they were too busy to participate in the research survey or they felt they generally receive too many email surveys. A few physicians later reported technical issues accessing the survey. Another limitation in interpreting the data is that the practice of Anesthesiologists in the VAHCS may not necessarily reflect the practice of all US Anesthesiologists, particularly among private practitioners. The option for reporting LMA use regardless of GERD severity was not provided, based on the assumption that practitioners would be very unlikely to completely ignore GERD severity in their practice. However, this could have introduced bias in the results.

The LMA has been shown to have multiple advantages over endotracheal intubation, including increased speed of placement by anesthetists, improved hemodynamic stability at induction and emergence, minimal rise in intraocular pressure following insertion, reduced anesthetic requirements for airway tolerance, lower frequency of coughing during emergence, improved oxygen saturation during emergence, and lower incidence of sore throat in adults [17]. The risk of regurgitation and aspiration in patients with GERD symptoms who undergo elective surgery under general anesthesia with the LMA is unknown. Although consideration of these risks in patients with GERD is prudent, it is also desirable to avoid unnecessary tracheal intubation or use of rapid sequence induction for this indication. We believed it was important to address practitioners' choices for elective LMA use in this setting.

From this survey, it appears that a large percentage of VAHCS practitioners are willing to place an LMA in patients with mild GERD while others are firmly opposed. Individual practice choices cannot be strongly advocated or disputed, in the absence of clear evidence. Further studies are warranted, to examine the incidence and severity of reflux under general anesthesia in this patient population and to refine the risks of pulmonary aspiration in different sub-groups: symptomatic vs asymptomatic, treated vs untreated, as well as NERD and functional dyspepsia. These issues will presumably only continue to grow with the aging and increasing obesity of the American surgical population [18-21].

CONCLUSION

Practices among VAHCS anesthesiologists with respect to the elective use of the LMA in patients with a history of GERD appear to be varied. Almost half of respondents reported being comfortable using the LMA in patients with mild GERD symptoms, while 19% were firmly opposed to LMA use in any patient with a history of GERD.

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