ORIGINAL ARTICLE

Airway management: A survey of training and practices of Nigerian anesthetists

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Abstract

Background: Airway management is an integral part of anesthetist's training and clinical practice. Studies have suggested that opportunities for anesthesia trainees to learn and practice endotracheal intubation have decreased over time. We sought to examine the current training and practices of airway management by anesthetists practicing in Nigeria.

Materials and Methods: A structured questionnaire was administered to delegates at an annual conference of the Nigerian Society of Anaesthetists. A total of 49 respondents participated in the survey. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 16.0, the results are presented in appropriate statistical tools, and the findings discussed.

Results: The response rate was 82%. Majority of the respondents (61%) had attended a course on airway management. Many of the respondents (54%) had less than 10 years of experience in anesthesia. Majority (69%) of the respondents were from teaching hospitals. All the respondents had access to laryngeal mask airways (LMAs) and 85% of respondents could use them very well. Fiberoptic bronchoscope (FOB) was available to 51% of the respondents and only 22% of them were conversant with its use, while 31% admitted that they needed more training. Majority (71%) of the respondents had received formal training in airway management, some of a short duration (47%).

Conclusion: Majority of our respondents had good knowledge of routine airway management using LMAs. Though FOBs may be available in some of the teaching hospitals, very few anesthetists are conversant with its use. There is increased use of simple airway devices with deskilling in complex airway management. Resource limitation means that very few individuals have access to training with novel airway techniques. There is need to increase funding of anesthesia training and services in order to improve skill acquisition and practice of airway management.

Key words: Airway management, anesthetists, practice, training

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Introduction

Management of the difficult airway is one of the most important patient safety issue in the practice of anesthesia but regrettably, studies have suggested that opportunities for anesthesia trainees to learn and practice endotracheal intubation have decreased over time.[1,2] This is becoming more problematic for the young trainees, as regional anesthesia is gaining popularity. Reduction in the use of general anesthesia especially for abdominal delivery had been recognized and well-documented in obstetric anesthesia practice.[3,4] Despite the use of alternative training methods and efforts to structure training, it remains a challenge to ensure that every anesthetist gains sufficient experience in the use of core techniques of airway management.[5] There had been successful demonstration of gum elastic bougie (GEB) and laryngeal mask airway (LMA) in emergency difficult airway by Shah *et al.*,[6] and by Onyekwulu and Nwosu,[7] respectively. This

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survey is a single point observational study at an annual scientific meeting of the Nigerian Society of Anaesthetists. In this study, we critically reviewed traditional and recent modalities of airway management, assessed the respondents' knowledge, and suggested possible multimodal approaches to airway management education.

Materials and Methods

A structured questionnaire was pretested on six doctors in anesthesia at various levels of training and practice. The same questionnaire was then administered to 60 participants at the Nigerian Society of Anaesthetists Annual Scientific Conference. Five persons did not complete the forms; 55 forms were completed, giving a response rate of 92%. Six forms were incompletely filled and so were not included in the data analysis. A total of 49 questionnaires were analyzed. The outcome measures sought included training in airway management, availability of airway devices, and their use by the respondents. The data were entered into Statistical Package for Social Sciences (SPSS) version 16.0 and expressed in means using appropriate charts and tables. Chi-square test was applied to appropriate variables and values <0.05 were accepted as statistically significant.

Results

The age range was 28-59 years with a mean of 40.5 years. Majority of the respondents were consultants (51%), while 14% were diplomates and the remaining 35% were at various levels of fellowship training. A total of 38% of respondents had 1-5 years of experience in anesthesia, while 34% had 6-14 years of experience in anesthesia, and 20% had 15-24 years of experience in anesthesia [Figure 1]. Majority of respondents (61%) had attended a course on airway management in the past [Figure 2]. All the respondents had access to LMAs in their hospitals, 63% to GEBs, and 51% to fiberoptic bronchoscopes (FOBs). A total of 41% of the respondents had emergency surgical airway trays in their hospitals, while only 2% had video laryngoscopes [Table 1]. When questioned on their ability to use the airway management devices; 67, 85, and 51% of respondents could use nasopharyngeal airways, LMAs, and GEBs, respectively; while only 22% were conversant with the use of FOBs [Table 2].

There was no statistical significance between years of experience in anesthesia and use of nasopharyngeal airways (Pearson's Chi-square 0.3). Likewise, there was no statistical significance between years of experience in anesthesia and ability to use LMAs (Pearson's Chi-square 0.2), GEBs (0.3), and fiberoptic intubating bronchoscopes (0.4). Also, there was no statistical significance between years of experience in anesthesia and ability to use cricothyrotomy (Pearson's Chi-square 0.4) and tracheostomy (Pearson's Chi-square 0.3) by the respondents. However, there was statistical significance between years of experience in anesthesia and ability to use esophageal tracheal combitube (ETC) (Pearson's Chi-square 0.033) among the respondents.

On respondents' training on difficult airway management, majority (71%) of the respondents had received formal training in airway management, some of a short duration (47%) [Table 3].

On training and medium of instruction during training, majority of respondents had received no formal training on the use of GEB, fibreoptic bronchoscopy, ETC, retrograde intubation , and cricothyrodotomy [Table 4]. The medium of instruction was commonly through lectures, discussions, use of models, and also use of patients. Patients were most often used for training on use of LMAs and GEBs [Table 4].

Discussion

Many national societies have developed algorithms and guidelines for management of the difficult airway. Maintenance of oxygenation is one of the most important tasks for the anesthetist.[8] This can be challenging when airway management becomes difficult. Respiratory problems are still the most important single cause of anesthetic adverse events that lead to a bad outcome and the true

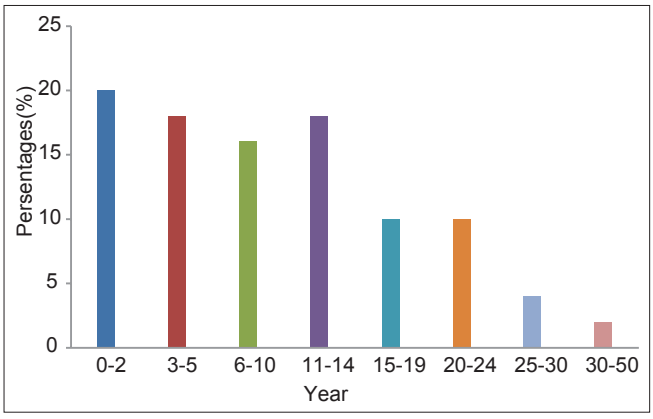

Figure 1: Years of experience in anesthesia

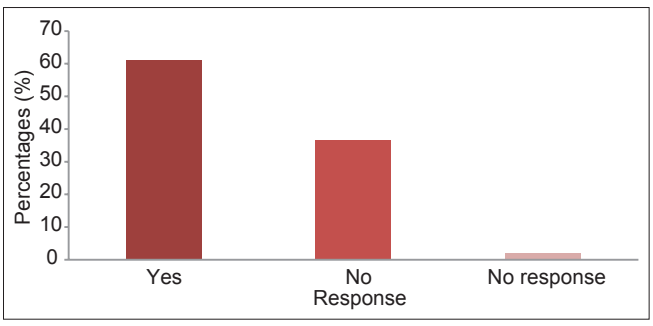

Figure 2: Attended course on airway management

number is likely to be greater than that published. [9,10] In our study, it was obvious that the respondents did not have enough time for airway management training. This paved way for inadequate practice in the use of various devices meant for difficult airway, except for LMA for which respondents were more familiar with and it was the most available.

Table 1: Availability of airway devices

	Frequency (%)				Total
	Yes	No	Do not know	No response	
Nasopharyngeal airway	33 (67.3)	9 (18.4)	3 (6.1)	4 (8.2)	49 (100)
LMA	49 (100)	-	-	-	49 (100)
Gum elastic bougie	31 (63.2)	10 (20.4)	4 (8.2)	4 (8.2)	49 (100)
Fiberoptic bronchoscope	25 (51)	19 (38.8)	1 (2.0)	4 (8.2)	49 (100)
Combitube	14 (28.6)	22 (44.9)	4 (8.2)	9 (18.4)	49 (100)
Emergency surgical Airway tray	20 (40.8)	20 (40.8)	5 (10.2)	4 (8.2)	49 (100)
Others (video laryngoscope)	2 (4.1)	-	-	47 (95.9)	49 (100)
Others (blind nasal)	1 (2.0)	-	-	48 (98.0)	49 (100)

LMA=Laryngeal mask airway

Table 2: Respondent's ability to use the airway devices/ technique

	Frequency (%)				Total
	Yes	No	Could do with practice	No response	
Nasopharyngeal airway	33 (67.3)	6 (12.2)	7 (14.3)	3 (6.1)	49 (100)
LMA	42 (85.7)	-	7 (14.3)	-	49 (100)
Gum elastic bougie	26 (53.1)	15 (30.6)	5 (10.2)	3 (6.1)	49 (100)
Fiberoptic bronchoscopy	11 (22.4)	22 (44.9)	15 (30.6)	1 (2.0)	49 (100)
Combitube	9 (18.4)	27 (55.1)	9 (18.4)	4 (8.2)	49 (100)
Cricothyroidotomy	6 (12.2)	28 (57.1)	12 (24.5)	3 (6.1)	49 (100)
Tracheostomy	16 (32.7)	23 (46.9)	6 (12.2)	4 (8.2)	49 (100)
Others (blind nasal)	-	-	1 (2)	48 (98)	49 (100)

LMA=Laryngeal mask airway

Table 3: Respondents' training on difficult airway management

	Frequency (%)			Total
	Yes	No	No response	
Had formal training	35 (71.4)	11 (22.4)	3 (6.1)	49 (100)
Total number of hours of training			16 (32.7)	49 (100)
0-4	23 (46.9)	-	-	-
5-10	4 (8.2)	-	-	-
11-15	1 (2)	-	-	-
16-30	5 (10.2)	-	-	-
Difficult airway laboratory	10 (20.4)	37 (75.5)	2 (4.1)	49 (100)
Have dedicated resource staff	15 (30.6)	30 (61.2)	4 (8.2)	49 (100)
Attended course/workshop	27 (55.1)	19 (38.8)	3 (6.1)	49 (100)

Nowadays, it is becoming less likely that trainees will be exposed to an adequate number of challenging airway cases that enable them to practice advanced techniques of airway management under supervision. One of the ways to overcome this deficit in anesthesia training is to prepare trainees as well as possible outside the operating room, so that clinical training opportunities can be used most effectively when they arise. Sufficient training can best be ensured when the required equipment and time are provided.

In our study, the mean age of respondents was 40 years, many of them were trainees at various levels of training and majority (54%) had less than 10 years of experience in anesthesia.

As there is no previous study to determine experience gained by trainees in Nigeria, we are unable to establish whether there has been a decrease in experience; however, we believe this is likely. Nevertheless, Ruckidge in a review noted that experience and confidence of anesthetists in obstetric airway management are diminishing.[11] Although competency is difficult to assess, it may be that these data have implications for training, unsupervised practice, and rostering. Experience in certain airway skills may need to be supplemented using techniques such as simulation.

Airway management will always be a practical matter and anesthetists have an obligation to gain and maintain the necessary skills. Skills with the Macintosh laryngoscope, LMA, bougie, and fiberoptic intubation are not sufficient to allow safe airway management of all patients. We must be prepared to manage rare life-threatening situations. In particular, experience in invasive airway techniques is essential (cannula/ surgical cricothyroidotomy). Training in such techniques is mandatory for any organization with a safety culture. These techniques should be practiced in workshops and their daily use in certain ear, nose, and throat (ENT) and trauma situations is good practice that provides further experience. The choices of specific flow charts and airway equipment are less important than having the equipment immediately available.

Regular use in elective cases is extremely important and departments should audit use of airway techniques by all anesthesia staff.[12] In this study, the LMA was available to all respondents and 85.7% were conversant with its use. Many authors have demonstrated the ease with which training and use of the LMA can be achieved. Compared with the FOB and video laryngoscope, the LMA is a relatively cheap device which explains its availability in resource-poor settings like ours. Only 4.1% of respondents in our study had video laryngoscopes in their centers. This value is very low when compared with 81% availability in a Canadian program.[13] Although Nigeria is a developing country unlike Canada, we still believe that video laryngoscopes and other sophisticated airway tools are affordable for training in our tertiary institutions. Routine practice with a wide variety of airway devices will only be possible when they are readily available in all operating rooms.

Table 4: Medium of instruction on the airway devices/technique during the training

Device/technique	Medium of instruction (n=49) (%)				
	Lecture	Discussion	Use of model	Use of patients	No. of instruction/practice
LMA	30 (61.2)	27 (55.1)	19 (38.8)	19 (38.8)	-
Gum elastic bougie	22 (44.9)	20 (40.8)	13 (26.5)	17 (34.7)	40 (81.6)
Fiberoptic bronchoscopy	22 (44.9)	21 (42.9)	20 (40.8)	10 (20.4)	47 (95.9)
Esophageal combitube	16 (32)	13 (26.5)	7 (14.3)	2 (4.1)	40 (81.6)
Retrograde intubation	17 (34.7)	15 (30.6)	5 (10.2)	1 (2)	40 (81.6)
Cricothyroidotomy	21 (42.9)	17 (34.7)	9 (18.4)	3 (6.1)	43 (87)
Direct Laryngoscopy	27 (55.1)	24 (49)	26 (53.1)	32 (65.3)	3 (6.1)

LMA=Laryngeal mask airway

From the results of this study, it is surprising to note that retrograde intubation, a technique that was first described in 1963 in Nigeria[14] for intubation of patients with cancrum oris, is now seldom being taught in Nigeria [Table 4].

The ETC (Combitube Kendall-Sheridan Catheter Corp., Argyle, NY, USA) is a blindly inserted, double-lumen tube designed to facilitate ventilation during cardiopulmonary resuscitation (CPR).[15] The literature supports use of the ETC as an effective alternative to endotracheal intubation. It is a noninvasive, easily-acquired skill, and the device functions when inserted into either the esophagus or the trachea. Although 81.6% of respondents reported not having any formal training on the use of the ETC, there was statistical significance between years of experience in anesthesia and ability to use this airway device (Pearson's Chi-square 0.033) among the respondents.

Limitations of the study

The sampling technique is based on convenience sampling because the questionnaires were handed out at a scientific meeting. This would select for anesthesia providers with either (a) financial ability to attend, (b) geographical proximity to attend, or (c) seniority to be allowed to attend a congress. This may well have skewed the results of this survey. Also, the total number appears small, although we do not have exact figures of the number of physician anesthetists in Nigeria; they may be well over 300.

Recommendations

To make the results of future surveys more valid, we recommend a postal survey to be sent to all practicing anesthesia providers in Nigeria.

Conclusion

Airway management is a practical matter and a sufficient range of proven techniques should be practiced every day to facilitate successful use in emergencies. Our study showed insufficient time for training in airway management, increased familiarity with the use of LMA, but inadequate knowledge and practice of other airway devices because of unavailability in major training centers. Regular practice with a wide variety of airway devices will only be possible when they are readily available in all operating rooms. Improvement in the teaching and practice of airway management with the use of simulators among other methods of teaching will be invaluable to achieve proper skill acquisition and capacity building by Nigerian anesthetists.

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