All India Difficult Airway Association guidelines in practice—A survey

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ABSTRACT

Background and Aims: The All India Difficult Airway Association (AIDAA) has come up with difficult airway (DA) guidelines to suit the Indian context. We conducted an online survey with the primary aim to find out the awareness about AIDAA guidelines and adherence to them in clinical practice. The secondary aims were to explore variations in practice with respect to experience or the type of the institute. Methods: An online web-based questionnaire survey was sent to all practising anaesthesiologists who attended an airway workshop. The validated and piloted questionnaire consisted of 23 questions and the practice patterns were asked to be graded on a Likert scale of four. Results: The response rate was 66%. Awareness about AIDAA guidelines was high (81%) but adherence varied. Apnoeic nasal oxygen insufflation was always practised by only 19.59%. Only 79.7% of the respondents always used capnography to confirm intubation. While 23.64% did not ensure a safe peripheral oxygen saturation (SpO₂) level of 95% to do repeat laryngoscopy, 64% chose supraglottic devices after three failed laryngoscopic attempts. A departmental debriefing of a DA event and issuing an alert card to the patient was practised by 58.78% and 52.7%, respectively. Although 50% had training to do cricothyrotomy, only 41% had ready access to a cricothyrotomy set in their workplace. The use of capnography was more prevalent in private institutions. The survey revealed a safety gap with some recommendations like debriefing of a DA event, alert card, nasal oxygenation etc. Conclusion: Awareness about AIDAA guidelines is high among our practising anaesthesiologists, but adherence to the recommendations varied and there is room for improvement, especially for debriefing a DA event, issuing an alert card, the use of capnography and nasal oxygenation.

Key words: Airway management, difficult airway, nasal oxygenation, survey

INTRODUCTION

Securing and maintaining a patent airway is the foremost responsibility of an anaesthesiologist. Complications related to airway management continue to be one of the leading issues behind closed claims in anaesthesia practice.¹,² A systematic algorithm will guide the practitioner in anticipated and unanticipated difficult airway (DA) scenarios to improve patient safety. Although there are well-established and robust international DA guidelines,³,⁴ these are mostly based on the clinical practice in their respective countries, and hence may not be equally applicable to the Indian scenario. The All India Difficult Airway Association (AIDAA) had come up with DA guidelines in 2016 to suit the Indian context. Adherence to guidelines improves patient safety but is highly variable. The lack of awareness and unavailability of resources often lead to non-adherence to guidelines in clinical practice. We conducted this survey to

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know the awareness about AIDAA guidelines and adherence to them in clinical practice by the practising anaesthesiologists.

**METHODS**

An online web-based survey was planned after obtaining the institutional research and ethics committee approval. This survey was performed among all the qualified practising anaesthesiologists who attended the airway workshop conducted in relation to a conference. Postgraduates and non practising anaesthesiologists were not included. It was done for two weeks after the conference in the months of March and April 2020. The primary aim was to assess the awareness about AIDAA guidelines and adherence to it in clinical practice among our practising anaesthesiologists. The secondary aims were to explore any variations in the practise patterns between government and private institutions with experience. The questionnaire contained a series of questions to evaluate the practice patterns of our anaesthesiologists and to assess the awareness and adherence to the guideline recommendations.

The questionnaire was formulated after a thorough literature search and was discussed and reviewed in the research group. Each question in the questionnaire related to a recommendation in the AIDDA guidelines on adult DA management. The questionnaire was validated for content by three senior anaesthesiologists working in teaching institutions. Then it was pretested and piloted among a convenience sample of 10 practising anaesthesiologists of varying experience who were not registered for the conference and their responses were excluded from the final analysis. Few changes were made in the questions for clarity and the final questionnaire of 23 questions was formatted on Google forms [Appendix 1]. The link to the Google forms was sent to the practitioners on their WhatsApp numbers with a covering message explaining the purpose of the survey. The contact numbers were collected at the time of the workshop. Strict anonymity was assured. Two reminder messages were sent, one every week after the first message was sent. The practitioners who did not respond could not be identified; however, reminders were sent to all. The survey was made available for six weeks. Participation was voluntary and responding to the survey was considered as consent to the survey.

The responses were graded based on a Likert scale of 4 (1-Always, 2-Often, 3-Sometimes, 4-Never). To know the level of adherence to the major recommendations of AIDAA guidelines, by our anaesthesiologists, a ‘safety gap’ analysis was done. The safety gap is the difference in actual versus observed clinical practice of the guidelines’ recommendations.

The sample size was estimated using the formula
\[ n = \frac{Z^2 \cdot 1 - \alpha / 2 \cdot P \cdot (1 - P)}{d^2} \]

Where \( p \) is the expected proportion, \( d \) is the absolute precision and \( 1 - \alpha / 2 \) is the desired confidence level. With an expected proportion of awareness of AIDAA guidelines as 75%, absolute precision of 7%, 95% confidence level and 80% power, the estimated sample size calculated was 147.

Statistical analysis was done using the R software version 4.0.1. Continuous variables were summarised as mean with standard deviation (SD) or median with inter-quartile range (IQR) depending on distribution. Categorical variables were summarised as proportions. The associations between experience and type of institution with the dependent variables were assessed using the unpaired t-test, Chi-square test or Fisher’s exact test depending on the type of variable and distribution.

**RESULTS**

The survey link was sent to 225 practising anaesthesiologists, of whom 148 (66%) responded. The mean age of the respondents was 44.13 ± 10 years, and 89/148 (60%) were females. 59.5% of respondents (88/148) had more than 10 years of experience and 75% were from private institutions [Table 1].

While awareness about AIDAA guidelines was high 120/148 (81%), adherence to the recommendations varied. The respondents were asked to grade their practice pattern on a Likert scale of 4 [Figure 1]. A majority of them assessed the airway preoperatively (86.48%). Capnography was always used to confirm intubation by 118/148 (79.72%) respondents. Apnoeic nasal oxygen insufflation was always used during difficult intubation by 19.59%, while 65.53% never or only sometimes used it. Cricoid pressure was used with rapid sequence induction for full stomach cases in the general population, which amounted to 57.43%. A modified rapid sequence induction with gentle, small tidal volume breaths was practised by 62.15%
in obstetric cases. Pre-oxygenation with three-minute tidal volume breaths and intubation under muscle relaxation using succinylcholine was the preferred technique (72.9% and 85.13%). The oxygen flow rate kept during pre-oxygenation varied widely from 4 to 12 L/minute.

In the event of an unanticipated difficult laryngoscopy, 113/148 (76.35%) respondents ensured >95% oxygen saturation (SpO₂) before reattempting laryngoscopy and 64.18% said that they would go for supraglottic airway device (SGAD) insertion after three failed attempts of laryngoscopy. Blind bougie insertion in difficult laryngoscopy was practised by 36.48%. While 50% (74/148) of the respondents had the training to do cricothyrotomy (CT), only 41.89% had ready availability of a CT set in their workplace. Reporting and discussing of an unanticipated DA event was practised by 87/148 (58.78%) of practitioners in their institutes and 78/148 (52.7%) issued a DA alert card to the patient.

The responses were analysed to look for any safety gap in clinical practice, which is the difference between actual observed and ideal practice. We observed a safety gap in some of the recommendations like repeated failed laryngoscopic attempts without ensuring a safe SpO₂ level, departmental debriefing of a DA event, issuing a DA alert card to a patient and the availability and training to do CT and capnographic confirmation of intubations [Figure 2].

For the association of variation in clinical practice patterns and the institution type, (government or private) where the clinicians’ works were analysed, the only significant difference noticed was the use of capnography to confirm intubation (P = 0.014), which was more prevalent in private institutions [Table 2]. There was no significant difference with respect to the level of experience of the respondent [Table 3].

Our practitioners’ opinion about AIDAA guidelines also varied. While 53.4% viewed it as evidence-based, 16.9% felt it as a rigid recommendation and 8.8% opined for the need for further refinements to guidelines. Of the 120 practitioners who were aware of the AIDAA guidelines, 43.3% had read it in the Indian Journal of Anaesthesia (IJA) and another 43.3% came to know about it from conferences.

**DISCUSSION**

Our survey assessed the awareness about and adherence to AIDAA guidelines in clinical practice among our qualified practising anaesthesiologists, and any variation in practice patterns with respect to experience and institutions. Inspite of the high awareness about Indian guidelines observed in this survey, the practice patterns varied widely from those recommended. The AIDAA had developed these guidelines for the management of DA scenarios in adult, paediatric, obstetric and intensive care unit (ICU) patients. The major recommendations for adult DA management included preoperative airway evaluation, optimum preoxygenation, continuous apnoeic nasal oxygen insufflation and restricting...
repeated failed laryngoscopic attempts to three, SGAD insertion attempts to two, and ensuring SpO₂ of >95% for re-attempting laryngoscopy, confirmation of all intubations with capnography, debriefing of any unanticipated DA event and issuing of a DA alert card to the patient.

Our survey revealed safety gaps in some of the recommendations. A safety gap in clinical practice indicates the potential for compromise in patient safety. These areas with safety gaps should be concentrated upon and improved to ensure patient safety in clinical practice. The largest safety gap was observed with continuous nasal oxygen insufflations, as only 19.6% of the respondents were practising it, which is similar to observations made from the United Kingdom (UK). Studies have shown that apnoeic oxygenation can significantly delay the onset of desaturation during the apnoea period. The nasal cannula can be placed during pre-oxygenation itself and continuous oxygen flow at 10–15 L/min is recommended to extend the safe apnoea period even in routine cases. The significance of this easy and inexpensive technique to safeguard the apnoea period should be emphasised and implemented in our clinical practice. Continuous positive airway pressure, pressure support ventilation or transnasal humidified rapid insufflation ventilatory exchange (THRIVE) can also be used to extend the safe apnoea period.

While capnography remains the gold standard for confirming endotracheal intubations, it is still not 100% practised and this is really alarming. This could be due to the non availability in a resource-limited country like India. However, capnography comes under minimum monitoring standards and this needs to be emphasised. The use of capnography for confirming intubation was low even with higher availability in other surveys. When the variation in clinical practice pattern was analysed with respect to experience and type of institution, capnography use was more prevalent among anaesthesiologists from private institutions which could be due to the higher availability of resources in corporate hospitals.

Guidelines stress the importance of ensuring more than 95% SpO₂ for re-attempting laryngoscopy and restricting repeated laryngoscopic attempts to three as these can easily result in a ‘cannot intubate cannot oxygenate’ scenario. It is alarming to observe that a reasonable number of clinicians still do not ensure the safe SpO₂ level of 95% to go ahead with repeat laryngoscopic attempts. Blind bougie insertion is not
advised as it can traumatisate the airway, but this is being practised by many. It was reassuring to see a majority of clinicians in our survey opting for airway rescue with SGAD in the event of three failed laryngoscopic attempts.

Departmental debriefing of any unanticipated DA event is crucial in identifying what went wrong during the management and is essential in preventing similar incidents in the future and to improve patient safety. Every mistake should be taken as a learning opportunity irrespective of the clinician’s experience or position. This will be possible only if there is good communication and rapport within the team members. A culture of ‘no blame’ should be cultivated. Documentation of any DA event in a standard format and issuing a copy of the same to the patient as an alert card for future reference is a must. Both these practices were rated as only ‘average’ in our clinicians’ practice; nevertheless, AIDAA had proposed a standard DA alert form which could be implemented in every institution.[5]

Another area with a significant safety gap is the availability and training to do CT, both of which were below 50% in our survey. But the confidence in performing CT has improved a lot from a low level of 18% shown in a previous survey done in the same area six years back.[17] The availability of CT sets and periodic simulation-based training for all clinicians to do a life-saving CT should be ensured.

As the safety and efficacy of Sellick’s manoeuvre in preventing aspiration has been questioned recently, only 62% of our anaesthesiologists practise giving cricoid pressure in obstetrics which is consistent with previous observations made in the UK.[11] Similar surveys in the past observed that one third of German anaesthesiologists did not use cricoid pressure[18] and a majority of practitioners in the United States of America did gentle mask ventilation during rapid sequence induction.[19]

Apart from the lack of awareness and non-availability of resources, non-adherence to guidelines in clinical practice depends on human factors too. The practitioners’ ability for critical decision making, attitude, personality and professional experience can also influence this.[20] The non-adherence to American Society of Anesthesiologists (ASA) guidelines even with good awareness among anaesthesiologists was reported earlier in a Canadian survey.[21] An inherent resistance to change one’s established practice pattern is common with adult learners.

We did not include all the recommendations of AIDAA guidelines and specific scenarios like paediatric and ICU patients in our survey. We failed to enquire about video laryngoscopy use in the questionnaire. In addition, the experiences in difficult airway management and specific training in difficult airway management were not included. The responses may not be the actual practice as there can be an overestimation of practice. As the surveyed anaesthesiologists were mainly the ones from South India who had attended a regional workshop, the results cannot be extrapolated to all the anaesthesiologists of India. A pan-India survey would have been better for that and we feel that AIDAA will take the initiative for such a survey.

**CONCLUSION**

To conclude, awareness about AIDAA guidelines was high among the surveyed anaesthesiologists but adherence to the recommendations varied. A significant safety gap in clinical practice was observed with respect to some of the recommendations. These areas should be concentrated upon and there is room for improvement, especially in apnoeic nasal oxygenation, DA debriefing and issuing an alert card, availability and training for CT, limiting repeated attempts at laryngoscopy, ensuring a safe SpO₂ of >95% and capnographic confirmation of intubations. AIDAA should continue the leading role to impart knowledge on DA management through workshops and CMEs. We feel that airway training certification should be made mandatory for all anaesthesiology trainee curriculums. Safe practice in airway management should be the core concept of our clinical practice.

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**Conflicts of interest**

There are no conflicts of interest.

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APPENDIX
Survey Questionnaire
1. Are You Aware Of All India Difficult Airway Association (AIDAA) guidelines for difficult airway management?
   Yes/No

2. If yes, how?
   a. I read in IJA
   b. I heard about it in a conference
   c. It is followed in my institution

3. I assess airway preoperatively
   a. Always
   b. Often
   c. Sometimes
   d. Never

4. I use nasal apnoeic oxygen insufflation in difficult airway intubation
   a. Always
   b. Often
   c. Sometimes
   d. Never

5. I use capnography to confirm intubation
   a. Always
   b. Often
   c. Sometimes
   d. Never

6. $\text{SpO}_2$ level at which you will reattempt laryngoscopy in a case of failed intubation and desaturation?
   a. 88%
   b. 90%
   c. 95%
   d. 98%

7. How many attempts of intubation do you allow before proceeding to placement of supraglottic airway device as rescue in a failed intubation?
   a. 2
   b. 3
   c. 4

8. Do you practise blind bougie insertion without seeing any part of glottis?
   Yes/No

9. Does your department practice reporting and discussion (Debrief) of a case of unanticipated difficult intubation?
   Yes/No

10. Do you give a document to notify difficult airway (Difficult airway alert card) to the patient at the time of discharge?
11. Do you have a cricothyrotomy set in your difficult airway cart?  
Yes/No

12. Are you trained to perform a cricothyrotomy?  
Yes/No

13. I use cricoids pressure in rapid sequence induction (RSI) for full stomach general population patients  
a. Cricoid  
b. Often  
c. Sometimes  
d. Never  

14. I use cricoids pressure in RSI in obstetric population  
a. Cricoid  
b. Often  
c. Sometimes  
d. Never  

15. Do you give small tidal volume breaths in RSI in obstetric population?  
Yes/No

16. Your technique of pre-oxygenation  
a. 3 minutes tidal volume ventilation  
b. 8 vital capacity breaths  
c. No specific technique

17. Oxygen flow rate you use during pre-oxygenation is............L/min

18. Muscle relaxant of choice in rapid sequence intubation:  
Rocuronium/Succinylcholine

19. What is your opinion about All India Difficult Airway Association (AIDAA) guidelines?  
a. Very rigid recommendations  
b. Evidence-based recommendations  
c. Needs modification to better suit Indian setup

20. Your age........

21. Sex: Male/Female

22. Years of experience  
a. < 5 years  
b. 5-10 years  
c. >10 years

23. Institution you are working at is  
a. Government  
b. Private