Evaluation of knowledge of the anesthesiologists about the available resources for the approach of difficult airway within the macro-region of Cariri

ORIGINAL

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Abstract

Introduction: Secure the airway is essential for a safe anesthetic practice and it occurs without difficulties in most cases. However, complications resulting from a failure in the approach used for a difficult airway are the main causes of morbidity and mortality attributable to anesthesia. In an attempt to prevent its severity, it becomes imperative to try to anticipate the difficulty whenever possible. Reports show incidence of difficult airway in approximately 2% of the general population and the ASA recommends the prior identification and the use of algorithms to address this complication.

Objective: The objective is to evaluate the knowledge of anesthesiologists from Cariri in relation to the available resources to handle difficult airway in hospitals where they work.

Method: Cross-sectional and qualitative study with the use of a questionnaire applied to all anesthesiologists. For this evaluation, we used a questionnaire to all anesthesiologists working in 9 hospitals in the macro-region of Cariri.

Results: 27 professionals answered the questionnaire. The prevalence of males was observed and 74% of anesthesiologists do not know the resources available or the protocols of the institutions in which they work.

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Conclusion: It is essential that the anesthesiologists also know the equipment available for an approach in the case of difficult airway in the services which they provide assistance so they can provide oxygenation to the patient in a fast and effective way, avoiding complications.

Introduction

Tracheal intubation can be defined as the introduction of a tube into the tracheal lumen. This procedure can be performed through the nostrils (nasotracheal), mouth (orotracheal) or through an opening directly in the wall of the trachea (trans-tracheal) through a tracheostomy or cricothyroidotomy. [1]

The first intubation report was published in 1543 by the scholar Andreas Vesalius. It was performed by tracheostomy in animals that developed pneumothorax, and the positive interaction of the cardiorespiratory system and preventing lung collapse were perceived. The first intubation, in humans, was only described by Trendelenburg in 1896 [2].

The tube used had an inflatable bag in its distal portion, which contributed to ensure the sealing of the airway. Initially, the tube was placed through a tracheotomy, but after the advent of laryngoscopes, the possibility to put them orally was established. [2]

Tracheal intubation using a direct laryngoscopy technique is the method used in everyday life to approach the airways and is the technique most commonly used to address it. [3] In this context, the quality of performance of the laryngoscopy, as well as the glottis display are essential for a successful intubation. [4]

It is up to the anesthesiologist to realize a clinical evaluation of the patient prior to the performance

of any procedure to recognize a potential difficult airway, to formulate a solution to overcome this situation and to ensure patient safety in the event of an unsuccessful intubation. [5]

It is worth mentioning that it is possible to anticipate some difficulties of tracheal intubation applying, still in the pre-anesthetic evaluation, Wilson, Mallampati or Cormack-Lehane indexes which allow the anesthesiologist to assess the thyromental, sternomental and interdental distances, as well as the degree of atlanto-occipital mobility. [1]

Difficult airway is a term used for certain situations in which a professional, considered experienced, finds difficulty in the performance of a tracheal intubation, to maintain ventilation using a mask, or both. [7]

The anesthesiologist is faced with a difficult airway in approximately 1-3% of performed intubations and 30% of the deaths related to anesthesia have as the causal factor the difficulty to secure the airway of the patient. [5]

The anesthesiologist should have a pre-formulated strategy for the intubation of difficult airways. This strategy depends, in part, on the type of surgery, the patient's condition, and the skills and preferences of the anesthesiologist [8] and the conditions available in the hospital, as well as the institutionalized protocols.

The difficult airway algorithm realized by the American Society of Anesthesiologists (ASA) establishes

the use of various devices, such as: laryngeal mask, ML-FastTrack® (fast-track laryngeal mask), retrograde intubation guide, lighted stylet, video laryngoscope, fiberscopes, optical stylet, combitube, etc. [9]

Secure a difficult airway becomes an easier situation to be conducted when the anesthesiologist is aware of the equipment that hospitals in which they work provide to address it and have ability to use them. Despite being one of the most feared situations in the everyday life of anesthesiologists, prior knowledge about the devices found in the hospitals, allows these professionals to feel more secure and able to address this kind of airway. Furthermore, if the airway approach is performed incorrectly, it can lead to a number of complications such as damage of these airways, induction of vomiting with aspiration of gastric contents, hypoxia, bradycardia, cardiac arrest, neurological damage and death. [10]

It is Important to note that the knowledge about what each hospital provides for this type of situation can also prevent further similar episodes, because the lack of certain equipment can be bypassed after the purchasing requisition performed by the professionals, together with the services they work for.

Method

This study is characterized by a descriptive and observational approach, cross-sectional and qualitative characteristic. A survey was performed on the knowledge of anesthesiologists from the Cariri macro-region about the devices available in hospitals where they work used to address a difficult airway.

The survey was conducted in three tertiary hospitals and six secondary from the macro-region of Cariri. These are hospitals that serve the clientele of the Unified Health System (SUS), philanthropic and private. The municipalities included were, Crato, Juazeiro do Norte and Barbalha.

The beginning of data collection took place from 20th of March 2014, after registration on the Plata-

forma Brasil and continued until the 31st of March 2014.

There were some considerations for this study, the anesthesiologists working in at least one of the hospitals located in the Cariri macro-region (Crato, Juazeiro do Norte and Barbalha) who signed the informed consent, after agreeing to participate in the research. The anesthesiologists who were not found in the studied period and those who refused to participate and did not sign the informed consent were excluded from the research.

The variables studied were: age, time each anesthesiologist exercises the profession in the Cariri region, if an airway evaluation is performed before any anesthesia, including regional and central blocks, which hospitals they work for and what equipment they provide to address a difficult airway. How many times each respondent was faced with a difficult airway in the last two years and if it was formally requested (in writing) the purchase of some equipment for difficult airway in any institution, as well as the requested device name and if it was purchased.

The basis of the survey was a questionnaire with open questions, built by the researchers, which was applied to anesthesiologists who work in this region. The questionnaire is in Appendix A.

Data analysis

After collecting the data, an analysis of the same was performed, aiming to find some relationship between the need for knowledge about what hospitals provide for difficult airway situations and the reality expressed by the knowledge of most anesthesiologists from Cariri. The answers collected during the interviews were divided in tables, in a percentage form.

Ethical aspects

The study was only initiated after approval from the Plataforma Brasil. Once approved, some care has been taken such as: clarification to the participants

of the goal of the study and procedures for data collection; and signing of the Informed Consent.

The participants of the research were informed of the right to withdraw from the study at any time; the guarantee of confidentiality and anonymity.

Results

The research was conducted with the delivery of questionnaires to 27 (twenty-seven) professionals employed in hospitals from the macro-region of Cariri (Crato, Juazeiro do Norte and Barbalha). From the responses collected, some data could be obtained.

From the participants, the vast majority were male (74%) and the minority were female (26%). Regarding the age, none of the interviewed professionals had less than 30 years old and the majority was in the age group of 30-40 years old (70%). Among the others, 15% were between 41 and 50 years and

11% were between 51 and 60 years old. Only 4% of the participants were above 60 years old. The distribution of the anesthesiologists by gender and age may be conferred in **Tables 1 and 2**, respectively.

From the applied questionnaire, it was possible to assess how long anesthesiologists practice their profession in the Cariri region. From the total sample, 15% work for a year or less in the region, 48% work for approximately 2 to 5 years, 11% work between 6 and 10 years, 7.5% work for 11-15 years and 18.5% work for over 20 years. The above result was shown in **Table 3**.

According to the interpretation of the questionnaire, **Table 4** shows that 70.3% of the anesthesiologists evaluate the patient's airway before submitting them to any type of anesthesia, including regional and central blocks. Only 29.7% do not make that assessment.

From the total sample obtained, the majority of anesthesiologists from the Cariri macro-region have run into more than one situation of difficult airway

Table 1. Anesthesiologists who claim to know the devices available for the approach of difficult airway in the hospitals where they work within the macro-region of Cariri

SEX	Absolut number	Percentage (%)
Female	7	26%
Male	20	74%
TOTAL	27	100%

Table 2. Anesthetists distribution in the macro-region of Cariri by age group

Age	Absolut number	Percentage (%)
Less than 30 years	0	0%
Among 30 – 40 years	19	70%
Among – 50 years	4	15%
among – 60 years	3	11%
More than 60 years	1	4%
TOTAL	27	100%

Table 3. Percentage of anesthesiology time in the macro-region of Cariri

Years from the practicing profession	Absolut number	Percentage (%)
Less than 1 year	4	15%
Among 1 - 5 years	3	48%
Among 6-10 years	3	11%
Among 11- 15 years	2	7,5%
Among 16- 20 years	0	0%
More than 20 years	5	18,5%
TOTAL	27	100%

Table 4. Percentage of anesthesiologists who made airway assessment before all anesthesia in the macro-region of Cariri

Airway assessment?	Absolut number	Percentage (%)
Yes	19	70,3%
No	8	29,7%
TOTAL	27	100%

in the past two years. In absolute numbers, it can be said that 18 of the surveyed anesthesiologists were faced with a difficult airway between one and five times in the last two years. This value corresponds to 66.7% of the sample. Six anesthesiologists (22.2% of the sample) had a larger number of difficult airway situations (between 6 and 10 times) in the same period. Only one anesthesiologist (3.7%) reported finding a number above ten situations like this within the same researched period. Two anesthesiologists said they were not faced with difficult airways in the last two years (7.4%). The results are scrutinized in **table 5**.

As seen in **Table 6**, a large number of anesthesiologists who work in the Cariri macro-region carry their own devices to circumvent situations like that described above. In percentage, about 63% reported having their own equipment to address a difficult airway. The remaining 37% reported not having devices for their own use.

It is important to note that 74% of the anesthesiologists working in the macro-region of Cariri are not aware of what the hospitals where they work provide for the approach of a difficult airway.

Despite the importance of having knowledge about what the institutions offer to address a difficult airway and, from this, formally request, together with the services, essential devices for this approach; the majority of the participants did not make this kind of request (**Table 1**).

Discussion

The approach for a difficult airway is always a relevant topic. The hypoxia, consequent to failure in intubation, is a major cause of death and severe neurological sequelae in patients with a difficult airway. [1] The forecast of difficult intubation should be performed in all patients, even those who are

Table 5. Percentage of anesthesiologists who have encountered difficult airway situation in the last two years in the macro-region of Cariri

Number of situations	Number of VAD	Percentage (%)
0	2	7,4%
1-5	18	66,7%
6-10	6	22,2%
>10	1	3,7%
Total	27	100%

Table 6. Percentage of anesthesiologists who carrier their own devices for the approach of difficult airway

Have own devices for *VAD?	Absolut number	Percentage (%)
Yes	17	63%
No	10	37%
TOTAL	27	100%

*VAD = Difficult airway

not undergoing general anesthesia [2, 3]. Despite this fact, this study showed that approximately 30% of the anesthesiologists from the Cariri macro-region declared they do not make this assessment in all patients.

The difficult airway is not a common entity. Some studies have shown that the occurrence of difficulty to verify the upper airway through direct laryngoscopy ranges from 1.5% to 8.5% and the failure to successful intubation is of 0.13% to 0.3% [4]. The data obtained by the study is consistent with the literature. The majority of the anesthesiologists from the Cariri macro-region, approximately 67%, reported between 1 and 5 cases of difficult airway during two years (**Table 2**). Although this is not very common, it is necessary that every anesthesiologist is trained to deal with this situation that is associated with immediate life-threatening risk or permanent neurological sequelae [6].

The prevention of airway complications requires prepared institution and staff, careful evaluation, planning and common sense, good communication and teamwork, knowledge and use of a variety of techniques and devices, and attention to the need to stop conducting techniques when they are failing [5]. The early recognition of physical characteristics enables the proper preparation of the team and provision of specific material for elective intubation (bag-mask unit, laryngeal mask, Combitube®, fiberscope). [4] Despite the clear need for knowledge of what each institution offers to address a difficult airway, most anesthesiologists (74%), from the survey conducted, demonstrated not to have that knowledge. In addition, most of them also carry their own devices for this type of approach (**Table 3**).

The Conselho Federal de Medicina (CFM, Portuguese for Federal Council of Medicine) published in the Diário Oficial da União the Resolution

1802/2006, which reports about the practice of anesthesia in Brazil. The 2° Article of this resolution holds responsible the technical director of the institution where there is the performance of anesthetic procedure for the minimum conditions to realize safe anesthesia. Then, the 3° article describes such minimum conditions, including explaining the materials that should be available so that the anesthesiologist can perform anesthesia and tracheal intubation, such as: oropharyngeal cannula, laryngeal masks, laryngoscopes, guides and conductive tweezers, plus equipment for cricothyroidotomy [7]. Thereby, it is emphasized the need for knowledge about what institutions really provide for the approach of difficult airway aiming to ask again, by request, for the availability of minimum conditions to carry out a safe anesthetic act.

Conclusion

Although there is a daily familiarity with situations of difficult airway, few anesthesiologists take this complaint to managers. However, the concern over the issue is perceived as it may lead to dramatic outcomes such as neurological damage or even death.

The study showed the need of the acquisition by managers of difficult airway devices, as well as the need to establish difficult airway approach protocols in the majority of the hospitals in Cariri.

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