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HABITS OF AIRWAY ASSESSMENT AMONG ANESTHESIOLOGISTS: A MULTICENTER STUDY

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Abstract:

Background and Aim: *Difficult intubation remains a challenging problem during general anesthesia in approximately 4.5- 7.5 % of apparently normal patients[2]. Airway related complications account for 35% of anesthesia related deaths [14].*

The aim of this study is to assess the most commonly used predictors, to reach to the most important predictors of anticipating difficult airway and to analyze the factors mostly lead to unanticipated difficult intubation.

Method: *A cross sectional study was conducted in July 2012 including all anesthesiologists at King Abdul- Aziz Medical City(KAMC) and King Khalid University hospital(KKUH)(n=112).*

All anesthesiologists (consultants, specialists and residents) were surveyed using a previously validated questionnaire, with a response rate of 91%.

Results: *The highest factor which lead to unanticipated difficult intubation was the unrecognized and unstructured airway assessment (50%).*

With regards to maneuvers (how to assess the airway), 94% of anesthesiologists used more than one method. Mallampati, Mouth opening and Thyromental distance were the most known and commonly used methods. About one half (45%) of anesthesiologists reported the limited cervical spine movement as the most important factor that contributes and leads to difficult intubation.

Conclusion: *In our study the anesthesiologists use more than one predictor to assess the airway and predict difficult intubation.*

Further studies are needed to assess the most reliable difficult intubation predictors and to estimate the incidence of difficult intubation.

Keywords: *Airway, predictors, difficult intubation.*

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INTRODUCTION:

Difficult airway and failure of intubation is a leading cause for morbidity and mortality in anesthesia practice [1]

Airway related complications account for 35% of all anesthesia related deaths [3].
Preoperative assessment is therefore very important to predict which patient is anticipated to have difficult airway and hence prepare a plan for intubation to avoid anesthesia related morbidity and mortality.

Several predictors are used by anesthesiologist to assess the airway . Most anesthesiologists use combination of these predictors during their assessment such as Thyromental Distance the normal distance is 6.5 cm[8], Mallampati Classification which was produced by Samsoon and Young[6] and introduced in 1985 [7] Mouth Opening, Sternomental Distance was also noted to be useful screening test 12.5 or less predicted difficult intubation [9], Willson Sum Scale [10-11], Upper lip Bite Test, Interincisor Gap, Temporomandibular Joint and LEMON Method.

In our study, we aim to reach what combinations of these predictors are most accurately predicting difficult airway by assessing most commonly used predictors by our anesthesiologists, and analyze the factors mostly lead to unanticipated difficult intubation and reach a fixed assessment that every anesthetist have to do it during prepare of the patient for operation[12-13]

METHODS:

Study Design:
this is **cross sectional study** include all Anesthesiologist in both hospitals to get respectively their opinion and thought about the most common methods which used to assess the airway for the patient in pre operation.

Site of action:
This study is conducted in National Guard Health Affair – King Fahad Hospital and King Khalid University Hospital among all anesthesiologists who work in both hospitals either Consultant, Specialists or Resident . Technicians are not. Included

Questionnaires and Questionnaires Design:
We did a Pilot study among 5 anesthesiologists to know time spending for the survey and for questionnaire clearance. Our survey is a self-questionnaire which is distributed to the whole anesthesiologists in two way: 1- Electronic survey that is done by Survey Monkey. 2- Print out survey which was most useful to collect the data from the responses.

Number of responders from anesthesia physician either Consultant or Residents are (103) from our minimum sample size which will be expected to be (70).

We collect (88) responds from National Guard Health Affairs – King Fahad Hospital and (15) surveys from King

Khalid University Hospital while (6) of anesthesia physicians refused to fill the questionnaires.
Our questionnaires was about knowing the experience, most common methods which is used for assessing the airway, methods known and \ or used for the airway assessment, factors mostly contribute to difficult intubation and factors that lead to unanticipated difficult intubation.

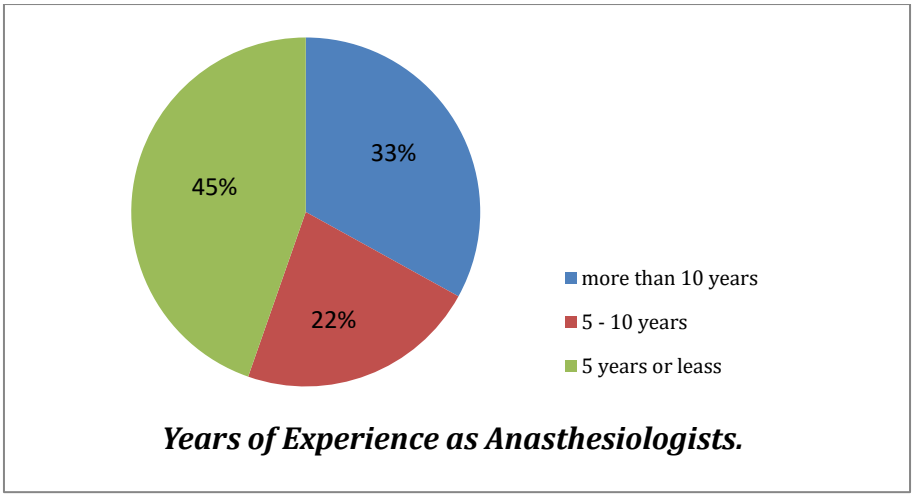
The questions were: -
Q1. What is your year of experience as anesthesiologist?
Q2. Which of the following do you use to assess difficult intubation before the operation?
Q3. Which of the following method do you know and use to assess patient's airway for difficult intubation?
Q4. In a scale out of **4 as the most important** and **1 as the least important,** which of the following factors mostly contribute to difficult intubation?
Q5. In your opinion, which of the following factors mostly lead to unanticipated difficult intubation?

Data Analysis :
103 Dataset is entered into a Microsoft Excel and sent to Bioinformatics Center in National Guard Health Affair in King Abdul-Aziz Medical City for statistical analysis

RESULTS:

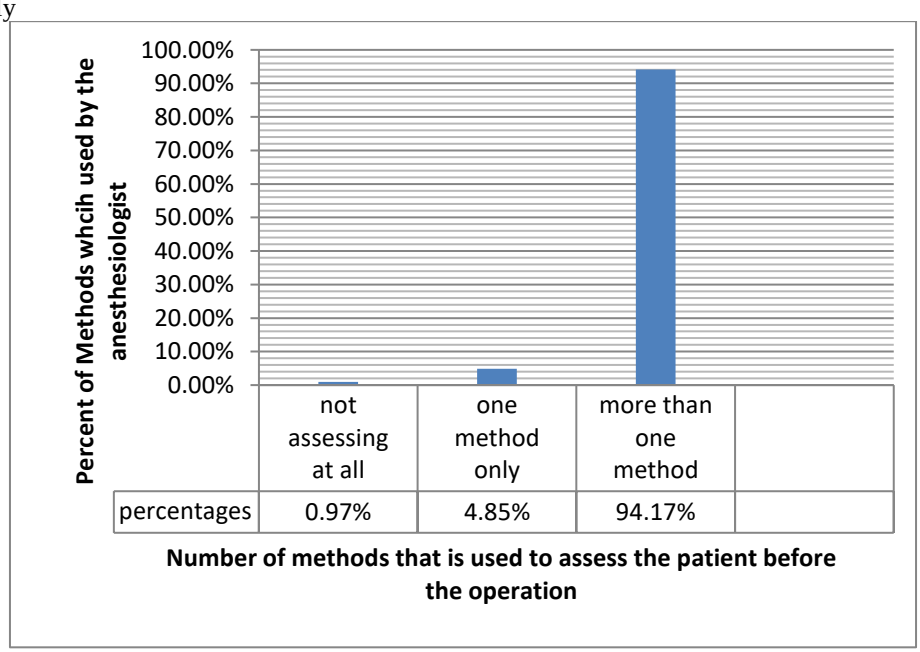
Number of responders to our questionnaire from anesthesia physicians(Either consultants or Residents) were 103.

45% (n=46) were residents with less than 5 years of experience, 22%(n=23) with 10 – 15 years of experience, and 33%(n=34) with more than 10 years of experience.



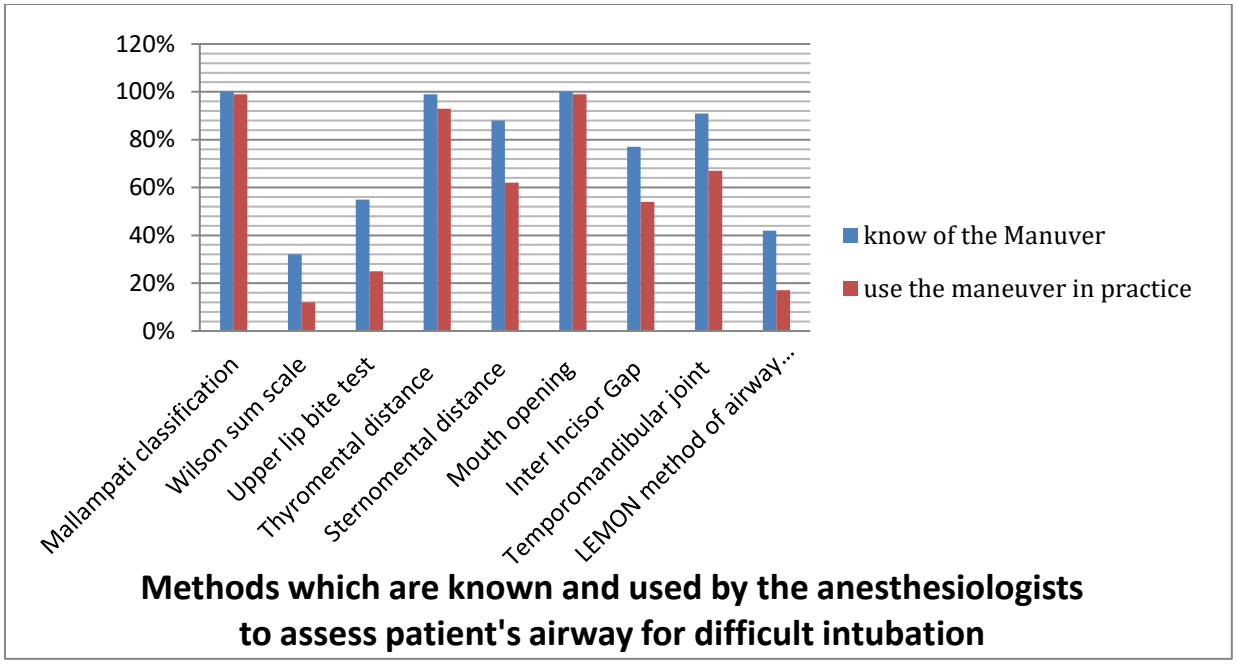
Graph 1

Approximately 95% of Anesthesiologists in our study use more than one method for assessing patient's airway preoperatively



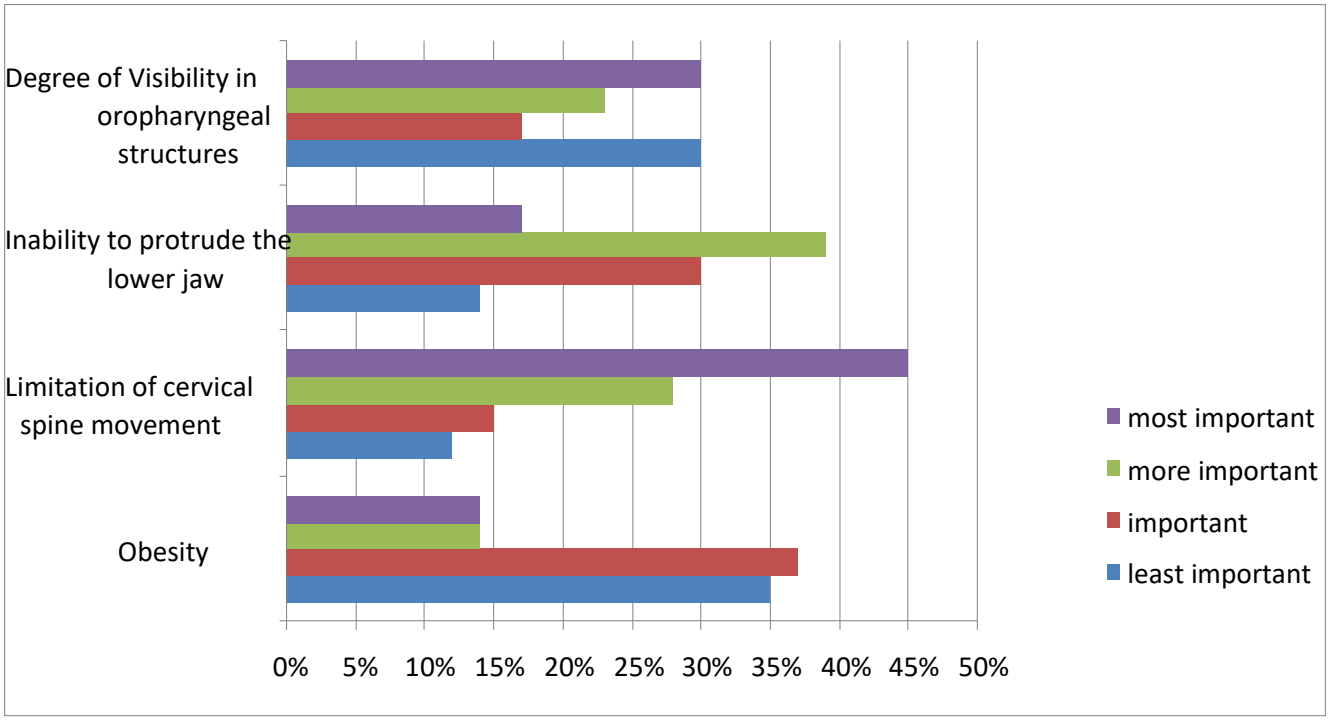
Graph 2

Mallampati, mouth opening and thyromental distance are the most known and used methods among anesthesiologists.



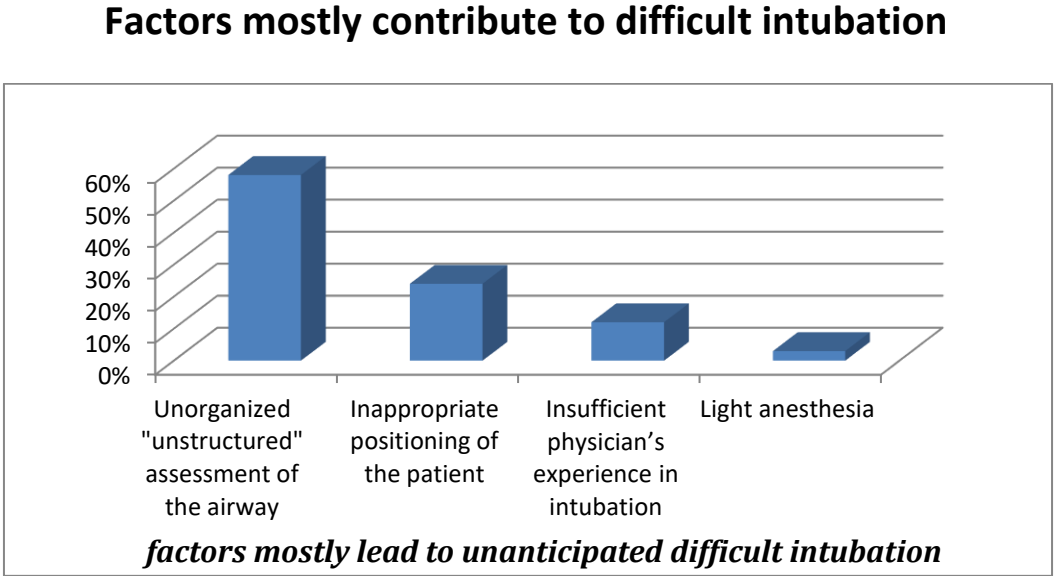
Graph 3

Limitation of cervical spine movement is the most important factor contributing to difficult intubation and obesity is the least important factor as the anesthesiologists thought.



Graph 4

Unstructured and unorganized airway assessment is the most important factor leading to unanticipated difficult intubation



Graph 5

DISCUSSION:

ASA defines difficult endotracheal intubation as 3 attempts at endotracheal intubation when an average laryngoscope is used or when endotracheal intubation takes 10 minutes or more[4].

Unanticipated difficult airway is a major factor contributing to anesthesia related morbidity and mortality.[2]

Preoperative assessment of airway plays major role to identify challenging airway[3].

By reviewing the literatures there are many predictors used by anesthesiologists worldwide.

In our study we divided the anesthesiologists who respond to our questionnaire(103) into 3 groups according to their years of experience.

First group with less than 5 years of experience(45%), second group with 5 – 10 years of experience(22%), and third group with more than 10 years of experience(33%).

Our results showed that there is a good correlation between the years of experience of anesthesiologists and the accurate prediction of the difficult airway.

There is no single method of prediction of difficult intubation that is both highly sensitive and highly specific [5]. So by reviewing the literatures we identified the most commonly used predictors and included them in our questionnaire which are: Mallampati classification, mouth opening, thyromental distance, temporomandibular joint, sternomental distance, interincisor gap, upper lip bite test, LEMON method and Wilson sum scale.
Our data analysis showed that 94.17% of anesthesiologists involved in the questionnaire used more than one predictor to assess the airway and 4.85% used only one predictor.

The most commonly used predictors were Mallampati classification and mouth opening(known by all anesthesiologists and used by 102), followed by Thromental distance(known by 102 anesthesiologists and used by 64),

While the least were LEMON method(known by 43 anesthesiologists and used by 17) and Wilson sum scale(known by 32 anesthesiologists and used by 12).

There was a significant difference in the opinion of anesthesiologists of which factor mostly contribute to difficult intubation.

While considering the limitation of cervical spine movement is the most important factor by 46 anesthesiologists as it has high incidence of difficult laryngoscopy[14]
Obesity is considered the least important factor by 14 anesthesiologists, and this is supported by other studies [14]

Degree of visibility of oropharyngeal structures is considered the second most important factor by 31 anesthesiologists followed by inability to protrude the lower jaw by 18 anesthesiologists. Crowded upper airway, and larger tongue, are indicator of difficult airway.[3]

Unstructured and unorganized airway assessment is the most important factor which lead to unanticipated difficult intubation (60 anesthesiologist), this finding was consistent with most studies and researches done that found a structured airway assessment will reduce the risk of anesthesia considerably as it can predict which patients are likely to have difficult airway and to plan the anesthesia management in advance.

Other less important factors where inappropriate positioning of the patient(25 anesthesiologists, insufficient physicians experience in intubation(12 anesthesiologists) and light anesthesia(3 anesthesiologists).

CONCLUSION:

We found that there is no unique approach for assessing the airway among the anesthesiologists. some cases with difficult airway might be missed if there is no good communication between anesthesiologists who is assessing the airway and the one who is providing anesthesia.

We suggest to have guideline for a structured unique airway assessment that can be applied in all our kingdom's hospitals and a better communication between anesthesiologists (The one who's assessing the airway and the one who's providing anesthesia. To reduce airway related complication in anesthesia.

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