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COMPARISON BETWEEN THE USE OF ENDOTRACHEAL TUBE AND LARYNGEAL MASK AIRWAY IN PATIENTS WITH UPPER RESPIRATORY TRACT INFECTIONS

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Abstract

Background: *The issue of airway management in patients with upper respiratory tract infections (URTI) continues to be a clinical problem, as it is associated with high-airway hyperirritability alongside the possibility of complications that may include laryngospasm and bronchospasm. This paper sought to provide a comparison between the efficacy and efficiency of Endotracheal Tube (ETT) and the Laryngeal Mask Airway (LMA) in patients with URTI undergoing anesthesia.*

Methods*: 120 patients were enrolled and split evenly in two groups; ETT (n=60) and LMA (n=60). The information was gathered about demographic data, number of attempts to make the insertion, ease of making the insertion, sufficiency of ventilating, manipulating the airways, and the complications during the perioperative period. The hemodynamic variables such as heart beats, blood pressure and oxygen saturation were noted at baseline, during insertion and post-insertion.*

Findings*: The study proposes that most patients were aged 2535 years (38.2) and males (72.4). LMA (90%): ETT (71.6%): The probability of successful airway insertion at the first attempt was significantly higher with LMA than it was with ETT. Ease of insertion was easy in 91.7 percent of LMA and 56.7 percent ETT. Sufficient ventilation was obtained in every instance. LMA did not necessitate the manipulation of airways in any patient, just like ETT. Nevertheless, both laryngospasm and bronchospasm were found to be much greater in ETT group (28.3 and 31.6) than in the LMA group (0.0% and 1.6). The LMA group had a higher hemodynamic stability with all the patients reporting regular Heart rate and Blood pressure readings right after insertion, as opposed to ETT insertion, which was characterized with short-term changes in heart rate and blood pressure.*

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Conclusion: *The research demonstrated that the Laryngeal Mask Airway demonstrated better performance over the Endotracheal Tube in regards of ease of insertion, reduced airway complications, and improved hemodynamic stability in patients with upper respiratory tract infections. LMA can be considered a less harmful and more effective substitute for airway patency in such cases.*

Recommendations: *The results of this study suggests that the use Laryngeal mask airway should be more frequent in Upper respiratory tract infections Patients because of its better efficacy. Except the surgeries in which Laryngeal mask airway is contraindicated due to other reasons.*

1 INTRODUCTION

Management of Airway is considered to be a crucial part of General Anesthesia procedure. General Anesthesia is a medical type of unconsciousness that has been induced through administration of anesthetic drugs and it is reversible. It is a Procedure that causes the lack of sensation and protective reflexes throughout the entire body. Because of which the natural capability of sufficient oxygen saturation of the body is impaired and thus necessitates airway control when means of mechanical ventilation. The Airway management devices are used to attain the mechanical ventilation. The most frequently used airway management equipments in the world are the Endotracheal tube and Laryngeal Mask Airway. This research was aimed at comparing the efficiency of the two airway management devices in the group of patients who have upper respiratory tract implemented (1).

The type of medical illness that is caused by Viruses or by Bacteria and Fungi along the upper respiratory system that comprises nose, sinuse, larynx, pharynx or trachea is called Upper Respiratory Tract Infections (URTIs). Such kind of infections have the symptoms of Sore throat, stuffy or runny nose, cough and fever. Condition of Upper Respiratory Tract Infection is one that poses its own problems with either LMA or ETT intubation (24).

At this, there are some extreme complications required to be under review in order to guarantee the patient safety during the procedure and sufficient recovery after the Procedure. The complications may include the following; Airway Edema URTIs may induce the inflammation of the mucosal larynx resulting in laryngeal swellings, pharynx and the Vocal cords. Laryngospasm that is involuntary constriction of vocal cords that may cause total or partial obstruction of the airway. Bronchospasm is an involuntary contraction of bronchi that causes wheezing and hard breathing. These complications are accompanied by even greater risk of aspiration during the procedure (2).

The applications of both airway management equipment LMA and ETT are only used in general anesthesia procedure. When the patient is under GA the protective reflexes of esophagus are either suppressed or non-existent which exposes the patient to aspiration and secretions or gastric contents entering the mouth as well as poor visualization of the trachea. LMA and ETT give defense against this aspirations. Also with that, the major applications of these machines are to sustain mechanical ventilation in the situation when the patient has lost the ability to generate spontaneous ventilation and on top of that, they can also be used to administer anesthetic gases (3).

Endotracheal tube is considered as a standard use of equipment in the patients with bacterial or viral infections in the upper part of airway i.e sinuses, nose, larynx, pharynx and trachea who are to be intubated for general anesthesia but there are studies that suggest that endotracheal intubation is associated with laryngeal odema. The supraglottic technique on the other hand offers relief of this complication although less commonly used in these kind of procedures. The study evaluating this context came to the conclusion that LMA is an adequate alternative for endotracheal inutbation in these kind of procedures because of its less invasive nature. It offers an advantage of being satisfactory

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equipment for positive pressure ventilation in elective short durated procedures (18).

Identification of post operative sore throat and factors associated with it is crucial to achieve optimal patient outcome. A study reviewed these factors related to endotracheal intubation in patients undergoing elective sugery with general anesthesia and suggested that the inidence of post operative sore throat was 48.8 % within twenty four hours of intubation but the reason of sore throat was not only was that endotracheal intubation was done but the result also varied on the size of device used and number of attempts taken to intubate. More number of attempts and larger size of ETT resulted in more complication of post operative sore throat (14).

A study performed for evaluating the incidences of non desired events related with intubation between two technologies for one lung ventilation in pediatric thoracic surgeries: using a LMA alongside a bronchial blocker (BB) in comparison to employing an ETT with a bronchial blocker. This study was a retrospective cohort study performed in a tertiary care hospital. The primary outcomes evaluated were postoperative complications related to intubation, which included the scale of sore throat, the classification of secretions, and fequency of laryngospasm, all of which were evaluated in the post-anesthesia care department. The further results that were assesed included, changes in blood vitals during the placement process and premature respiratoy events following surgery. The findings suggested that the LMA-BB technique might be limked with less early airway related adverse events after surgery in children requiring OLV when compared to the ETT-BB method. These results imply that utilizing an LMA with a BB could be a viable substitute for specific thoracic surgeries in pediatric patients (29).

A study that collected specific information associated with the usage of laryngeal mask airway and endotracheal tube as more common airway maintainence equipment in pediatric laparoscopic inguinal hernia repair (LIHR). A thorough review found that LMA and ETT share similar characteristics in terms of safety, but their clinical impacts were limited due to methodological flaws, such as poor handling of zero event trials, neglect of GRADE evaluations, and the representation of risk of bias assessments overall, without specific details for outcomes or domains.

The goal of the study was to evaluate and enhance the methodological quality of the evidence comparing LMA and ETT in pediatric LIHR by including new trials, assessing risk of bias per outcome, managing zero events, and applying GRADE certainty ratings. The findings suggested that LMA may present minor advantages over ETT regarding anesthesia and recovery durations as well as certain respiratory metrics in pediatric LIHR, all while maintaining safety standards. Nevertheless, the evidence is still limited due to methodological variability, limited event data, and low GRADE certainty for the majority of outcomes. This review improves previous analyses by integrating outcome-specific risk of bias evaluations, managing zero event trials, and employing GRADE evidence rating to facilitate better-informed decision-making in pediatric airway management (33).

The research question was that the administration of anaesthesia to pediatrics with URTIs predisposes the respiratory adverse complications perioperatively. A few articles have indicated that supraglottic airway (SGA) i.e Laryngeal mask airway technique might be an alternative that can be used to manage airway in children compared to Endotracheal tube. The findings of this article also confirmed that a SGA airway method decreased coughing, bronchospasm and oxygen desaturation, which offers a satisfactory substitute to the ETT in children with minor or severe URTIs (17).

A study emphasized on the fact that some of the severe complications of patients undergoing general anesthesia may be associated with poor visualization of tracheal structures and accessing these complications is crucial. So with core aim of evaluating the effect of education for nurses regarding these complications the author concluded that he application of educational guidelines regarding airway risks and complications for patients using laryngeal masks and endotracheal tubes has positive effects on

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improving patients knowledge. Also, has a significant effect on decreasing the frequency of risks and complications of the laryngeal mask airway and endotracheal tube (3).

Endotracheal tube (ETT) is a kind of flexible pipe that is employed to hold the airway of patients in an operating room to provide them with mechanical ventilation or delivery of oxygen in case of their inability to breathe on their own. The anesthetic gases can also be administered through it. It is mouth to mouth inserted in the trachea. There are some pros and cons of it. Its benefits are that it offers superior protection of airways and reduces the risk of secretions and aspirations. Therefore as a result of this aspect has been established to be the best option in long term surgeries. The drawbacks are that since it is inserted to trachea, it can also result in sympathetic stimulation which might lead to heart rate or blood pressure increase and intracranial pressure, it also leads to post operative side effects like sore throat and hoarsenees.

Laryngeal Mask Airway is a medical equipment that is used to keep the patients mouth or airway open during anesthesia and it is used for oxygenation, ventilation and adminadministration of esthetic gases. It is a masked shaped cuff that is held above the trachea. Along with that it has a tube that connects the mask to a breathing circuit or anesthesia machine. It is a device that is known to be used in short duration surgeries , as a emergency airway device and also as a rescue device during difficult intubations. This device has known advantages of Easier and faster insertion and lower incidence of laryngospasm and bronchospasm. And a known critical disadvantage is that it offers less airway protection.

Endotracheal tube (ETT) is a type of airway management device that requires invasive intubation through the vocal cords into the trachea. While Laryngeal mask airway is an Supraglottic airway management equipment that is minimally invasive. Both devices have their own advantages and disadvantages based on the the type of procedure they are being used for (4).

The goal for this study was to find out which device is better in terms of providing optimum ventilation and for offering less complications during General Anesthesia Procedure in Patients with Respiratory Tract Infections in upper airway. The Parameters for the measurement of Efficacy in both airway management devices in the upper respiratory tract infections are as follows; Hemodynamic Stability, the device that offers better control of heart rate, blood pressure or mean arterial pressure is more often preferred. Increased airway secretions and inflammation, the device that is know for causing more airway secretions and inflammation are avoided. Complications in post operative period such as sore throat and hoarsenees the device that is associated with more post operative complications is also avoided (25).

The Importance of Anesthesia is not only limited to procedure of getting the patients unconscious via the administration of anesthetic drugs. But it is also the responsibility of the Anesthesiologists to plan the procedure which is ideal and optimal in accordance of the Patients needs. So In order to improve patient care a research regarding to the evaluation of both devices Laryngeal mask airway and Endotracheal tube in patients with upper respiratory tract infections is crucial. This Research will prove to be beneficial for improvement of patients care in terms of clinicians making informed decisions which would result in better choice of equipment, less complications and overall better patient hoarsenees (5).

All the existing literature in regards of this topic suggests that Laryngeal mask airway is linked with less events of laryngospasm and bronchospasm and along with that post operative sore throat, coughing and hoarseness during emergence. But most of the existing information is based on either a elective surgery or a specific complication such as laryngospasm or is based on a specific age group mostly pediatrics. There is very little existing literature in regards to comparing the endotracheal tube and Laryngeal mask airway in patients with respiratory tract infections in upper airway specifically. Hence the study on this topic offers very crucial and beneficial in context of

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better patient care and optimal post operative recovery of the patient (6).

A study that was performed both in Operation theaters and post surgical care unit with the aim of evaluating the effectiveness of Endotracheal tube and Supreme Laryngeal mask airway, which is single used, disposable Laryngeal mask airway in patients with Atelactasis, which is the partial or complete collapse of lungs which will result in reduced or absence in gas exchange. The study used lung ultrasound for providing evidence based information for respiratory management. The findings of this study concluded that compares to Endotracheal tube the laryngeal mask airway effectively reduces the progression of Atelactasis. Additionally, the research indicated that the effectiveness of laryngeal masks in decreasing postoperative atelectasis is still unclear when thorough monitoring of muscle relaxation and reversal treatment is used (7).

The objective of the study performing comparison of the two techniques was to find out the respiratory complications throughout the operative period, associated with laryngeal mask airway and endotracheal intubation. The patients who were scheduled for surgical procedures with endotracheal tube or laryngeal mask frequently experience respiratory complications when undergoing general anesthesia. These Respiratory complications can have a significant impact on patients health such as extended duration of hospital stay, Expensive healthcare cost etc. In this study a sample size of 137 patients scheduled for elective surgeries was taken, Out of the 137 patients 70 were assigned to Endotracheal tube group and 67 to the Laryngeal Mask Airway group. The results of this study suggested that Desaturation and Coughing was discovered in over half (53%) in the ETT group as Compared to the 14% for desaturation and 29% for coughing in the LMA group (8).

Tonsillectomy, Upper Nasal and Sinuses surgical procedures conducted with Laryngeal Mask Airway as compared to the more commonly used Endotracheal tube has been the point of argument for a extensive period of time. A study evaluating the credibility of the argumentthat whether if flexible laryngeal mask airway can be first choice equipment for maintaining airway patency and avoiding complications such as aspiration. The study reported that LMA is a quiet ideal and sufficient equipment for these kind of upper airway surgeries. Along with that LMA offer less intubation and extubation duration with less pulmonary and cardiac complications (9).

Similarly another research compared the efficiency of LMA and ETT in one the most commonly performed surgical procedure worldwide, Adenotonsillectomy. In these surgical procedures ETT has been considered to be the first choice equipment. This study conducted a systematic evaluation regarding the efficiency of LMA and ETT and reported that LMA can serve as viable alternative to ETT in appropiate surgical procedures. It is essential for the surgeon and anesthesiologist to carefully select patients and make judicious judgments, particularly in light of evidence indicating the potential necessity of converting to an endotracheal tube during the operation (10).

Intubation becomes more difficult in patients with respiratory tract infections in upper airway because infection and inflammation produces physiological changes that complicates airway visualization and hence the placement of the tube becomes complicated which results in increased risk of airway trauma. Along with that Upper respiratory tract infections cause mucosal swelling and inflammation through larynx, pharynx, nose and trachea which results in airway edema. Airway edema i.e narrowing of the airway even in smallest of margins in critical structures such as trachea can reduce the airway diameter such as oxygen saturation. Which is a vital part of health and fluctuations in this can even lead to the demise of the patient if not managed timely and accordingly (11).

Infections also increase the production of secretions in the airway which increase the chances of aspiration and further complicates intubation. Infections and inflammations are more sensitive to rigorous touch of instruments so in this condition intubation may also provoke laryngospasm, bronchospasm and coughing further increasing the difficulty of intubation and

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potentially causing hypoxia (decrease of the amount of oxygen in blood at tissue level) which can also be life threatening. Upper respiratory tract infections (URTIs) are a cause of morbidity and mortality worldwide with ongoing efforts for its management strategies this study also aims to contribute to this cause (12).

Even if the intubation becomes successful the patient with respiratory tract infections in the upper part of airway are at a risk of Post extubation striker or airway obstruction and along with that increased risk of bleeding and exacerbation of inflammation and infection. So the Evident information regarding the topic in discussion indicates that the use of laryngeal mask airway instead of Endotracheal intubation may serve better in patients with upper respiratory tract infections Since the LMA is a device which is less invasive and does not require intubation into the trachea.

A study evaluating the LMA and Endotracheal intubation as airway management strategies during tracheal repairment of tracheal stenosis with aim of analyzing outcomes between two groups. The researchers of that study concluded that Laryngeal Mask Airway can be a feasible option for tracheal resection and reconstruction of tracheal stenosis surgery with limitations of it being used in less operation duration, admission rate, ICU stay (13).

A research evaluated the impact of laryngeal mask airway and the endotracheal tube on hemodynamic changes and airway complications in pediatrics undergoing general anesthesia. This study focused on randomized controlled trials (RCTs). Two separate reviewers evaluated the quality of the studies using the Cochrane Risk of Bias Tool. A total of eight RCTs were analyzed. In comparison to the ETT, the LMA required fewer placement attempts. Additionally, the ETT was linked to increased hemodynamic changes. The incidences of postoperative respiratory issues, including Laryngospasm, Bronchospasm, and Sore throat, was also more frequent with the ETT. The results suggest that the LMA is a adequate substitute to the ETT for pediatric patients, as it is associated with fewer hemodynamic changes and postoperative complications. (26).

1.1 Rationale of Study

The rational of this study is that the Upper respiratory tract infections (URTIs) are a cause of morbidity and mortality throughout the world and there are existing parameters that can be used to enhance their treatment. In URTIs, the airways of patients often require their management that can become complicated due to the presence of the secretions, inflammation, and the potential airways blockage. Even though the airway treatment is essential in patients with URTIs, few studies have compared ETTs and LMAs utilization in this patient cohort (22).

Majority of the existing literature has been conducted by imposing the same machines on the patients who are undergoing an elective operation or are in a critical condition, as compared to URTIs patients. Therefore, the study will be able to compare the ETT and LMA efficacies and safety among the patients with URTIs focusing on the airway pressures and tidal volumes, airway resistance and compliance. The results of the study will bring the valuable data regarding the most appropriate airway management practice to the clients with URTIs that will be then utilized to improve the patient outcomes and reduce the morbidity and mortality rates (23).

1.2 Aims and Objectibves of the Study

The Objectives and Aims of our Research are as follows.

- To compare the Efficacy between the two equipments by means of Hemodynamic stability, Ease in insertion, Number of Attempts taken, Occurrence of complications such as laryngospasm and bronchospasm in the patients with respiratory tract infections in the upper part of airway.

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2 LITERATURE REVIEW

Behrooz et al. (2022) performed a systematic review to assess the efficacy of the laryngeal Mask Airway as an replacement to the endotracheal tube. The Laryngeal Mask Airway is regarded as a suitable option for management of airwayduring general anesthesia; as a matter of fact, Numerous existing literaure has suggested that it is connected with fewer complications in comparison to the endotracheal intubation. However it has been noted to not work in instances where it is a long period surgery. It was a random clinical trial research with a sample size of 80 randomly divided into two. The important variables were ease of placement, CO2, oxygen saturation and airway spasms among others. Findings of this research proposed that laryngeal mask airway would be an appropiate technique of airway management in general anesthesia for longer periods of more than 2 hour long surgeries (4).

Efrem et al. (2020) carried out a research on the potential benefits of flexible laryngeal mask airway (FLMA) in comparison to the endotracheal tube which is related to post operative sore throat. The occurrence of the sore throat and hoarseness was also substantially less under FLMA group as compared to ETT group in the post operative period as well as scope of sore throat. There was also significantly less buckling at the extubation and the variation of heart rate and blood pressure that followed the intubation in LMA group as compared to the ETT group. Compared to ETT patients undergiong thyroid operation using FLMA, experienced fewer laryngopharyngeal symptoms (14).

Ostabela Mutashaga et al. (2020) compared the prevalence of Periopertive complications in Endotracheal tube and Laryngeal Mask Airway. The researcher found the cause of morbidity and mortality to be the periopertive respiratory complications and it also results in time of long hospitalization. That is why the researcher who wanted to measure the incidence of perioperative complications in the two groups conducted this study and observed that the respiratory complications such as desaturation and cough was more common in ETT group as compared to the LMA group (8).

Shenghua Yu et al. (2025) represented in his research that respiratory tract infections in the upper airway and respiratory compliations perioperatively make a lot of risks for anesthesia in pediatric patients undergoing tonsills surgery. The goal of this study was that after tonsillectomy comparing the variables between the two groups in post surgical period of the anesthesia. The results revealed that children with respiratory tract infections in the upper airway had a greater incidence of respiratory complications perioperatively even though only small amount of treatments were required to manage symptoms, and no severe adverse events were reported. With proper optimization of perioperative anesthesia management, anesthesia in majority of pediatrics is secure even if they have URTIs (35).

Diala Al Mardini et al. (2022) Assessed the issues related to the Laryngeal Mask Airway, focusing on its effectiveness in maintaining airway security and reducing complications like aspiration. The objective of the study was to compare the efficiency of the flexible laryngeal mask airway with that of the standard Endotracheal tube during upper respiratory tract procedures. The study's findings indicated that the flexible laryngeal mask airway is a viable option for securing the airway during upper respiratory surgeries, with no associated cardiac or respiratory issues. In fact, it also provides the added advantages of a shorter induction time and reduced duration of use (9).

Mona Mohammed Elhadi et al. (2024) Highlighted a different Perspective which affects the usage of both devices Laryngeal mask airway and Endotracheal tube through their study. They highlighted that subjectively the bronchoscopic view obtained while using the laryngeal mask airway is better in comparison to Endotracheal intubation. They emphasized on the fact that some of the severe complications of patients undergoing general anesthesia may be associated with poor visualization of tracheal structures and

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accessing these complications is crucial. So with core aim of evaluating the effect of education for nurses regarding these complications the author concluded that he application of educational guidelines regarding airway risks and complications for patients using laryngeal masks and endotracheal tubes has positive effects on improving patients knowledge. Also, has a significant effect on decreasing the frequency of risks and complications of the laryngeal mask airway and endotracheal tube (3).

Sami Khoury et al. (2024) Evaluated the use of LMA against the standard use of ETT in Adenotonsillectomy Surgery which is one of the most common surgeries worldwide. The researchers conducted the surgery and concluded that laryngeal mask airway is a effective substitute option to ETT in Adenotonsillectomy surgery as it requires less operative time. But at the same time the study mentioned a precaution of careful patient selection and the judgement of anesthesiologist. The reason for that is because the results of the study also provides a evidence of conversion rate from LMA to ETT (10).

Ruby Foster. (2018) Conducted research that specifically investigated whether children with upper respiratory infections who are scheduled for surgery face a higher risk of negative aiway related issues when using a LMA as opposed to an ETT. Numerous studies have analyzed the differences between the Laryngeal mask airway and the Endotracheal tube in children, in addition to this particular research. The majority of studies evaluating each equipment in pediatrics with respiratory infections in the upper respiratory tract have primarily suggested that the laryngeal mask airway is the preferable option for reducing harmful respiratory incidents (12).

Bin Liu et al. (2024) proposed a study that aimed to evaluate the outcomes of Endotracheal tube and Supreme LMA, a one time use and disposable laryngeal mask airway on patients with condition called atelactasis or partial or complete blockage of lungs. The study used lung ultrasound in the provision of respiratory management which was as evidence based provision. The findings of this study reached to an endpoint that compared the endotracheal tube, laryngeal mask airway may be a good deterrent of the atelactasis progression. The study also indicated that the effectiveness of laryngeal mask mask to prevention of post operative atelactasis remains unknown even when thorough evaluation of muscle relaxants and reversal therapy is done (7).

Xhang Liu et al. (2021) carried out a research that comprised of 100 pediatric patients who experienced first or second degree of tonsallar hypertrophy, i.e., their tonsillar swelling due to some infection or allergies etc. Some of the effects caused by this condition include sore throat, difficulty breathing and obstruction of the airways. The chosen population sample to carry out the study were divided into two groups of 50 in Laryngeal Mask airway and 50 in Endotracheal tube. The research showed that the laryngeal mask airway (LMA) has become an important alternative in the routine and difficult airway management. We aimed to compare the safety and effectiveness of the LMA application in hypertrophic tonsillar children. The result of the study revealed the fact that Laryngeal Mask airway is associated with the reduced rate of complications laryngospasm or coughing. And is not inferior to Endotracheal tube in the amount of ventilation leakage and peak airway pressure (15).

Jawaria Barkat et al. (2025) performed a study with the aim of determining that among the two devices ETT and laryngeal mask airway what is the rate of incidence and how severe is the impact with each equipment. Many previous studies had the same objective but the study also aimed to find out that if or not there is an impact of age and ASA status on the occurrence of Laryngospasm in each Equipment. The study revealed that that although the episodes of laryngeal mask airway may be longer but the incidence of Laryngospasm occurrence is significantly lower in Laryngeal Mask Airway as compared to Endotracheal intubation (16). Jing Shii et al. (2025) was a randomised controlled trial that was conducted under the purpose of collecting information regarding the choice of

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airway management equipments among pediatrics with minor or severe infection of the upper airway tract. The research question was that the administration of anaesthesia to pediatrics with URTIs predisposes the respiratory adverse complications perioperatively. A few articles have indicated that supraglottic airway (SGA) i.e Laryngeal mask airway technique might be an alternative that can be used to manage airway in children compared to Endotracheal tube. The findings of this article also confirmed that a SGA airway method decreased coughing, bronchospasm and oxygen desaturation, which offers a satisfactory substitute to the ETT in children with minor or severe URTIs (17).

Nadar Kalaivani et al. (2023) conducted a research with the objective of determining the efficacy between the laryngeal mask airway and endotracheal intubation among children. The paper has drawn the issues of the complications of Endotracheal tube that has over the years become the normative application in Pediatric surgery. Some of the complications include Vocal cord injury and Laryngeal Oedema. The objective of the study was to determine whether Laryngeal Mask airway may be an adequate alternative or not. The results of findings claimed that LMA is less invasive and easier to use than ETT in pediatric patients and hence a secure airway to use in pressure ventilation in common selective short surgical practices (18). Dr Yogesh Kumar et al. (2022) conducted a comparative study on the hemodynamic variation in General anesthesia with the use of endotracheal tube and laryngeal mask airway as airway intubation devices. The researchers have clarified that management of airways is essential when using general anesthesia. And although it has become the default option of gear it is related to alteration of hemodynamics during general anesthesia. Laryngeal Mask Airway on the other hand is known to be related with improved Hemodynamic response. This was the research factor to be tested and in conclusion, the research also confirmed the fact that the outcome of the research proves that the implementation of a laryngeal mask airway (LMA) during the general anaesthetic procedure has a much better hemodynamic stability, easier and faster insertion, and lacks intra- and postoperative airway complications than an endotracheal intubation (ETT). The results indicate that LMA is a less risky and more comfortable option in particular during the short-term elective procedures. It is the more accepted way of airway management in the selective patients due to its advantages (19).

Ajay Kumar et al. (2025) conducted a study which aimed to evaluate the efficacy and the stability of the hemodynamic and the postoperative complications of using the laryngeal mask airway versus the endotracheal intubation in the children who were under general anesthesia. The research has helped the researchers draw a conclusion that LMA is faster, less invasive, and hemodynamically stable to ETT substitute in anesthesia in children and results in fewer postoperative airway related complications. LMA is healthier and suitable as an alternative to the routine airway management in children during the time they undergo an elective surgery(20).

Sukhee Park et al. (2023) Within the context of comparing gaseous exchange in operating room this research included the comparison of second generation Laryngeal mask airway versus the the use of an Endotracheal tube, in the context of long curated laparoscopic abdominal surgery. By longer surgeries they mean the surgeries that are performed taking a period of more than two hours. The research culminated in the understanding that When laparoscopic abdominal surgery is carried out over a long term, the second-generation Laryngeal mask Aireway can be used as an alternative of Endotracheal tube to ensure that enough amount of gas gets to the body throughout the surgery (21).

Mehrdad Malekshoar et al. (2024) evaluated respiratory standards in regards of airway management with endotracheal tubes (ETT) and laryngeal masks (LMA) in patients undergoing general anesthesia for orthopedic procedures. Throughout all measured incidences, the average of peak airway pressure and P plateau readings in the ETT group were much higher than those in the LMA group. No significant differences were observed in arterial oxygen saturation or end-tidal carbon dioxide levels between the two groups .

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The lung compliance for the LMA group were much better than those for the ETT group during all measured instances. The study reportedthat the LMA device was more efficient than the ETT in sustaining arterial oxygen saturation stability while also improving respiratory dynamic compliance (27).

Jia Yana et al. (2023) performed a research for measurement of complications during General Anesthesia with the use of either endotracheal tubes and laryngeal mask airways in patients undergoing laparoscopic hysterectomy. No patient scheduled for laparoscopic hysterectomy were on preoperative medication before surgery. The patients were evaluated thoroughly with ECG, pulse oximeter, Non invasive BP monitoring, end-tidal carbon dioxide pressures etc after being admitted in the operating room. Anesthesia medcations used were propofol or etomidate, muscle relaxants, and sufentanil. The study's findings reported that the ETT group faced a increased incidence of sore throat, vomiting and cough issues, requiring more medical interention than the LMA group. The findings suggest that LMA is a more efficient management technique and that general anesthesia with LMA can be safely used in patients undergoing laparoscopic non-emergency hysterectomy (28).

Meng Li et al. (2025) proposed a study emphasizing on evaluation of safety in flexible laryngeal masks as compared to endotracheal intubation in pediatrics undergoing tonsills removal surgery across variable age groups. They evaluated and documented factors such as surgery duration, recovery from anesthesia, and postoperative complications including coughing, bronchospasm, and laryngeal edema. Additionally, they documented agitation scores during the recovery phase, level of consciouss, and Air leakage during surgery. The study's results reported that the use of a flexible LMA in pediatrics older than three years leads to minor fluctuated effects and shows impactful results, thus validating its increased utilization in clinical settings (34).

Heqi liu MD et al. (2025) performed a study for evaluating the incidences of non desired events related with intubation between two technologies for one lung ventilation in pediatric thoracic surgeries: using a LMA alongside a bronchial blocker (BB) in comparison to employing an ETT with a bronchial blocker. This study was a retrospective cohort study performed in a tertiary care hospital. The primary outcomes evaluated were postoperative complications related to intubation, which included the scale of sore throat, the classification of secretions, and fequency of laryngospasm, all of which were evaluated in the post-anesthesia care department. The further results that were assesed included, changes in blood vitals during the placement process and premature respiratoy events following surgery. The findings suggested that the LMA-BB technique might be limked with less early airway related adverse events after surgery in children requiring OLV when compared to the ETT-BB method. These results imply that utilizing an LMA with a BB could be a viable substitute for specific thoracic surgeries in pediatric patients (29).

Saad Arsalan et al. (2025) conducted a study that collected specific information associated with the usage of laryngeal mask airway and endotracheal tube as more common airway maintainence equipment in pediatric laparoscopic inguinal hernia repair (LIHR). A thorough review found that LMA and ETT share similar characteristics in terms of safety, but their clinical impacts were limited due to methodological flaws, such as poor handling of zero event trials, neglect of GRADE evaluations, and the representation of risk of bias assessments overall, without specific details for outcomes or domains. The goal of the study was to evaluate and enhance the methodological quality of the evidence comparing LMA and ETT in pediatric LIHR by including new trials, assessing risk of bias per outcome, managing zero events, and applying GRADE certainty ratings. The findings suggested that LMA may present minor advantages over ETT regarding anesthesia and recovery durations as well as certain respiratory metrics in pediatric LIHR, all while maintaining safety standards. Nevertheless, the evidence is still limited due to methodological

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variability, limited event data, and low GRADE certainty for the majority of outcomes. This review improves previous analyses by integrating outcome-specific risk of bias evaluations, managing zero event trials, and employing GRADE evidence rating to facilitate better-informed decision-making in pediatric airway management (33).

Mehmet Duran et al. (2022) perfomed a study evaluating the efficiency of insertion in flexible laryngeal mask (FLMA) as compared ETT intubation in children scheduled for adeno-tonsillectomy surgery. A sample size of 60 patients was evaluated in the research. The children were splitted into two groups: the FLMA group (n = 30) and the endotracheal tube (ETT) group (n = 30). The two groups were analyzed based on intubation duration, heart rate, oxygen saturation levels, end tidal cardon dioxide, surgical visibility, and recovery duration. The findings suggested that the recovery time and placement time were less in the LMA group in comparison to the ETT group (30).

Kevin Zi Kai Ooi et al. (2025) performed a research that examined adenotonsillectomy, a common procedure in pediatric patients. ETT has been a more common and desired equipment for maintaining the airway patency during anesthesia, while the LMA was introduced later as a impactful alternative. Nevertheless, the risk of laryngospasm associated with these airway management techniques remains doubtful. This review evaluated the frequency of laryngospasm in relation to the use of LMA versus ETT in pediatric adenotonsillectomy. An thorough literature review was conducted for this study. The studies comparing the use of Laryngeal mask and Endoracheal tube in this specific surgery among pediatric patients (aged 1 month to 18 years) suggesting that the incidence of laryngospasm is the main outcome were put in this article. The results suggested that the LMA does not significantly reduce the occurrence of laryngospasm compared to ETT in pediatric adenotonsillectomy, and more randomized controlled trials should be implemented to confirm this eval uation(31).

Nicolas Lester et al. (2024) emphasize in their study that the use of laryngeal masks as airway device for the cure of infantile lacrimal duct stenosis is dangerous due to the chances of aspiration. This study examined airway management techniques in children under 6 years old who were undergoing surgery for lacrimal duct stenosis at a tertiary care hospital. The results reported that using LMA for infantile lacrimal duct stenosis looks to be a safe method and should be considered to appy in pediatric cases due to its less invasiveness, minimal complication rates, and efficiency in duration (32).

3 METHODOLOGY

3.1 MATERIAL AND METHODS

3.1.1 Study Design

This research follows a quantitative, cross sectional research design to analyze the effectiveness of Laryngeal mask airway and Endotracheal tube in patients with Upper respiratory tract infections. The study aims to measure which device is better in terms of avoiding issues such as Laryngospasm, Bronchospasm and providing better hemodynamic stability.

3.1.2 Settings

The investigation took place at operating theatre, the staff, included surgeons, anesthesiologists, and anesthesia technologyists working in hospital operating rooms.

3.1.3 Study Duration

The research span was extend across 4 to 6 weeks as approved by the research synopsis.

3.1.4 Sample Size

The formula for sample size calculation is Cochran formula of calculating two proportions :

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$$n = \frac{(Z_{\alpha/2}+Z_{\beta})^2 \cdot [p_1(1-p_1)+p_2(1-p_2)]}{(p_1-p_2)^2}$$

where,
n = sample size per group
Zα/2 = Z-score corresponding to α/2 (1.96 for α = 0.05)
Zβ = Z-score corresponding to β (0.842 for β = 0.2)
p1 = expected incidence of laryngospasm with LMA (0.1)
p2 = expected incidence of laryngospasm with ETT (0.2)
n = (1.96 + 0.842)^2 * (0.1 * (1-0.1) + 0.2 * (1-0.2)) / (0.1 - 0.2)^2
n ≈ 58.8
Rounding up to the nearest whole number:
n ≈ 60

For a total sample size of:
N = 2 * n
N = 2 * 60
N= 120
Thus, 60 respondents for each group will be included in this study.

3.1.5 Sampling Technique

A convenience non-probability sampling technique will be utilized.

3.1.6 Sample Selection

Inclusion Criteria

It will include:

a) Patients with upper respiratory tract infections confirmed by clinical diagnosis and laboratory tests.

b) Patients who require airway management for respiratory failure or elective surgery.

Exclusion Criteria

It will include:

c) Patients with a contraindication to Laryngeal Mask Airway or Endotracheal tube.

d) Patients who are Pregnant or breast feeding..

3.1.7 Informed Consent

Informed consent was obtained from every patient that participated in the study. No information included in this study is against the will of participating individual.

3.1.8 Study Parameters

- **Independent Parameters**

ETT : Endotracheal tube used for airway patency during surgical procedures under General Anesthesia.

LMA : Laryngeal Mask Airway used for airway patency during surgical procedures under General Anesthesia.

URTIs : Upper respiratory tract infections.

- **Dependent Parameters**

Hemodynamic changes: Deviated blood pressure that can cause insufficient blood flow to organs.

Laryngospasm: An involuntary contraction in the muscles of the vocal cords.

Bronchospasm: An involuntary contraction in the muscles of the bronchioles.

Post-operative complications: Complications that occur after a procedure or surgery, such as sore throat or hoarseness.

Efficacy: The effectiveness of the airway management device used.

Airway resistance: The pressure required to move air through the lungs.

Airway compliance: The ability of the lungs to stretch and expand.

Oxygen desaturation: A decrease in the amount of oxygen in the blood.

3.1.9 Outcome Measures

Outcome measurements were based on quantitative data derived from the questionnaire. Key outcomes included:

- Demographic Information : Categorized among different age groups and gender on mcqs based format.

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- Airway Management Details : To know which equipment was used and how efficient it was on a scale such as how easy the insertion was Mild, Moderate or Difficult.
- Adequate Ventilation or Inadequate Ventilation (Yes or No)
- Occurrence of Laryngospasm or Bronchospasm (Yes or No)
- Heart Rate, Blood Pressure and Oxygen Saturation at Baseline, During Insertion and Post Insertion (Low , Normal , High)

3.1.10 Data Collection Tool

The tool used for data gathering was a questionnaire made in accordance for this study. The questionnaire consisted of five sections:

- **Patients Information:** Participant details such as Age, Gender, Mallampati Classification and Presence of Upper respiratory tract infections.
- **Airway Management Details :** Which device among LMA and ETT was used.
- **Efficacy of the Device :** To find out whether the used device was effective in providing adequate ventilation and securing the airway.
- **Respiratory Complications :** Occurrence of Laryngospasm or Bronchospasm.
- **Hemodynamic Parameters :** Measurements of Heart rate, Blood Pressure and Oxygen saturation before, during and after the insertion of a specific device.

The questionnaire contained multiple-choice questions (MCQs) based format for quantitative data.

3.1.11 Data Collection Procedure

This will be a Cross sectional study and in this study Non Probability Convenience sampling method will be used to learn more about the use of laryngeal mask airways and endotracheal tubes in patients with upper respiratory tract infections. This study will aim to get thorough answers from the participants in the study by obtaining data by means of a Survey or Questionnaire.

The main tool for gathering data will be a structured questionnaire that will gather quantitative data by including close ended questions. Furthermore the questionnaire will be broken up into sections that address important study factors, demographic information, and supplementary remarks.

3.1.12 Data/ Statistical Analysis

The analysis will be performed through Statistical Package for the Social Sciences (SPSS) version 27 to generate a complete evaluation of research variables.

3.1.13 Ethical Consideration

The study was concluded under strict ethical guidelines which are as follows:

- Every patients that participated in the study gave a educated consent.
- Patients were made aware that they have the authority to reject participation or withdraw on their will.
- Patient were assured that their data will be kept confidential and anonymous.
- Patients were chosed based on study criteria, ensuring fairness and minimizing bias.
- Patients were randomly allocated to either the LMA or ETT group, ensuring an equitable distribution of benefits and risks.
- The study protocol, data, and results will be transparent and available for scrutiny.

RESULTS

4.1 Frequency Analysis with Respect to each Variable.

3.1.14 Age in Years

Frequency analysis of the Age of participating Patients show that among the total sample size of 120 patients, 34 patients were between the age group of 15-25, 47 patients were between the age group of 25-35, 29 patients were between the age group of 35-45 and 10 patients were between the age group of 45-55.

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Table 1 Frequency Analysis for the Variable Age in Years

Age in Years (Grouped)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-25	34	27.6	28.3	28.3
	25-35	47	38.2	39.2	67.5
	35-45	29	23.6	24.2	91.7
	45-55	10	8.1	8.3	100.0
	Total	120	97.6	100.0	
Missing	System	3	2.4		
Total		123	100.0		

The Pie Chart demonstrates the distribution of the patients participating in the study among different age categories respectively.

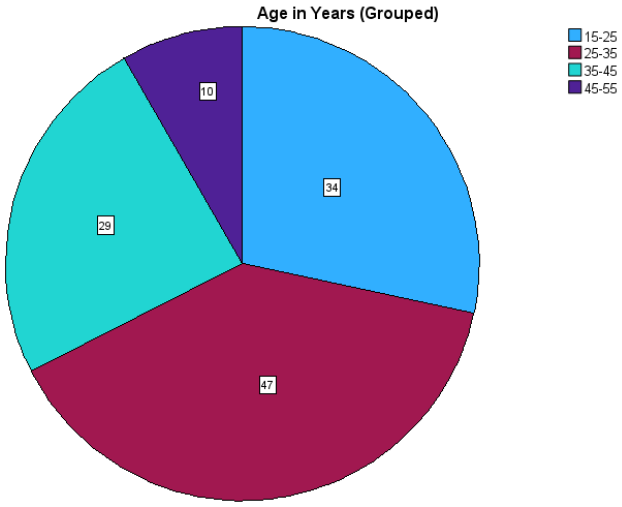


Figure 1 Pie Chart for the Variable Age in Years

3.1.15

3.1.16 Gender Distribution

Frequency analysis of the Gender of participating Patients show that among the total sample size of 120 patients, 89 patients were Male and 31 patients were Female.

Table 2 Frequency Analysis for the Variable Gender Distribution

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	89	72.4	74.2	74.2
	Female	31	25.2	25.8	100.0
	Total	120	97.6	100.0	
Missing	System	3	2.4		
Total		123	100.0		

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The Pie Chart illustrates the distribution of patients among different gender of Male and Female. The Majority of population as Male represented in Blue (89) and the rest in Red (31).

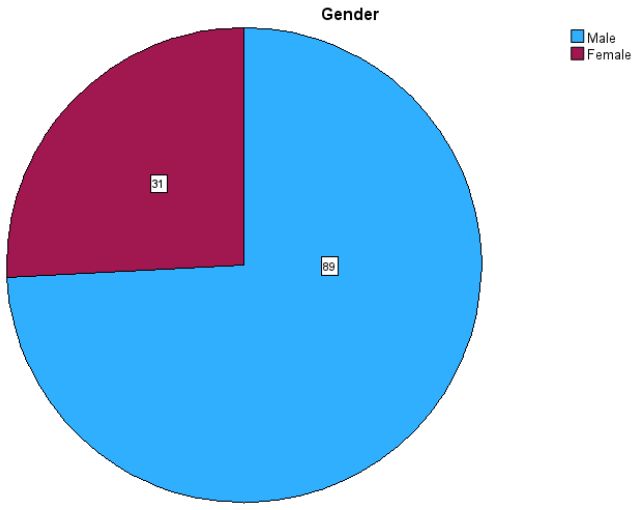


Figure 2 Pie Chart for the Variable Gender Distribution

4.1.3 Mallampati classification

Frequency analysis of the Mallampati classifiation of participating Patients show that among the total sample size of 120 patients, 94 patients were classified as Grade 1, 22 patients were classified as Grade 2, 4 patients were classified as Grade 3.

Table 3 Frequency Analysis for the Variable Mallampati classification

Mallampati Classification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I	94	76.4	78.3	78.3
	II	22	17.9	18.3	96.7
	III	4	3.3	3.3	100.0
	Total	120	97.6	100.0	
Missing	System	3	2.4		
Total		123	100.0		

The Pie chart illustrates the Mallampati classification of Patients among the four grades with Majority of Participants classified as Grade 1 (Blue) and some classified as Grade 2 (Red) and only a few in Grade 3 (Green).

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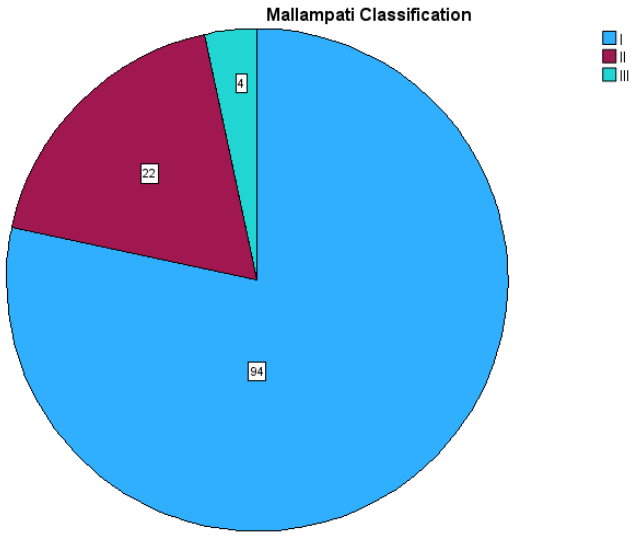


Figure 3 Pie chart for the variable Mallampati classification

3.2 Analytical Calculations

4.2.1 To Analyze the impact of Airway device used on the number of attempts taken to insert the equipment.

4.2.1.1 Hypothesis

H_0 = There is no association between the Airway device used and number of attempts taken to insert.
H_1 = There is Significant Association between the Airway device used and number of attempts taken to insert.

4.2.1.2 Level of Significance

p = .011

4.2.1.3 Test Statistics

Fisher exact test (Chi-Square) was applied

4.2.1.4 Results

Table 4 Cross Tabulation between the Variables Airway device used and Number of attempts taken

Airway Device Used * Number of Attempts Crosstabulation

Count

		Number of Attempts		
		1	2	Total
Airway Device Used	ETT	43	17	60
	LMA	54	6	60
Total		97	23	120

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Table 5 Analysis Result for Chi-Square Test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.508[a]	1	.011		
Continuity Correction[b]	5.379	1	.020		
Likelihood Ratio	6.733	1	.009		
Fisher's Exact Test				.019	.010
Linear-by-Linear Association	6.454	1	.011		
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.50.

b. Computed only for a 2x2 table

4.2.1.5 Conclusion

Cross Tabulation analysis between Airway device used and Number of Attempts for insertion show that total sample size of 120 patients were equally divided into two groups, Among the 60 patients for ETT group 43 patients were intubated in 1 attempt and remaining 17 in 2 attempts and Among the 60 for LMA group 54 were intubated on 1 attempt and remaining 6 in 2 attempts.

The Chi-Square test ($\chi 2$ = 6.508, p= . 011) shows that Number of attempts has significant association with airway device used.

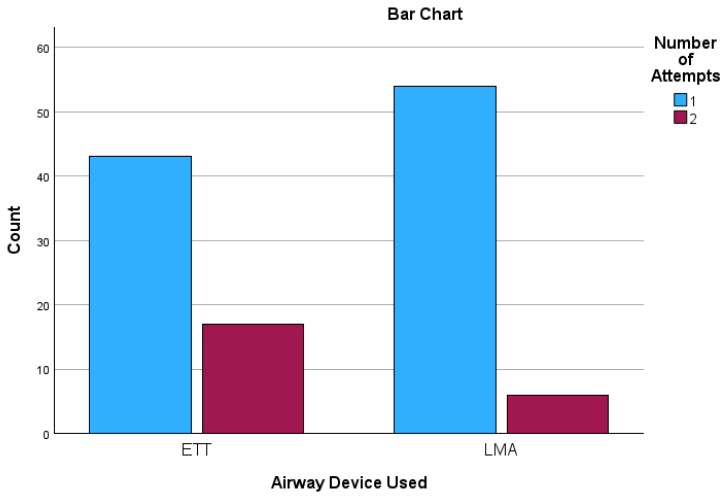


Figure 4 Bar Chart for the Variables Number of attempts taken and Airway device used.

4.2.2 To Analyze the impact of Airway device used on the Ease of Insertion to insert the equipment.

3.2.1.1 Hypothesis

H_0 = There is no association between the Airway device used and Ease of Insertion..

H_1 = There is Significant Association between the Airway device used and Ease of Insertion

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3.2.1.2 Level of Significance

P = <.001

3.2.1.3 Test Statistics

Fisher exact test (Chi-Square) was applied.

4.2.2.4 Results

Table 6 Cross Tabulation between the Variables Airway device used and Ease of Insertion

Airway Device Used * Ease of insertion Crosstabulation

Count

		Ease of insertion			
		Easy	Moderate	Difficult	Total
Airway Device Used	ETT	34	9	17	60
	LMA	55	5	0	60
Total		89	14	17	120

Table 7 Analysis result for Chi-Square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	23.098[a]	2	<.001
Likelihood Ratio	29.728	2	<.001
Linear-by-Linear Association	22.802	1	<.001
N of Valid Cases	120		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.00.

4.2.2.5 Conclusion

Cross Tabulation analysis between Airway device used and Ease of Insertion show that total sample size of 120 patients were equally divided into two groups, Among the 60 patients for ETT group 34 patients were easily intubated, 9 were intubated moderatley and remaining 17 faced difficult intubation and Among the 60 for LMA group 55 patients were easily intubated, 5 were intubated moderatley and no one faced difficult intubation.

The Chi-Square test ($\chi 2$ = 23.098, p= <.001) shows that Ease of Insertion has significant association with airway device used.

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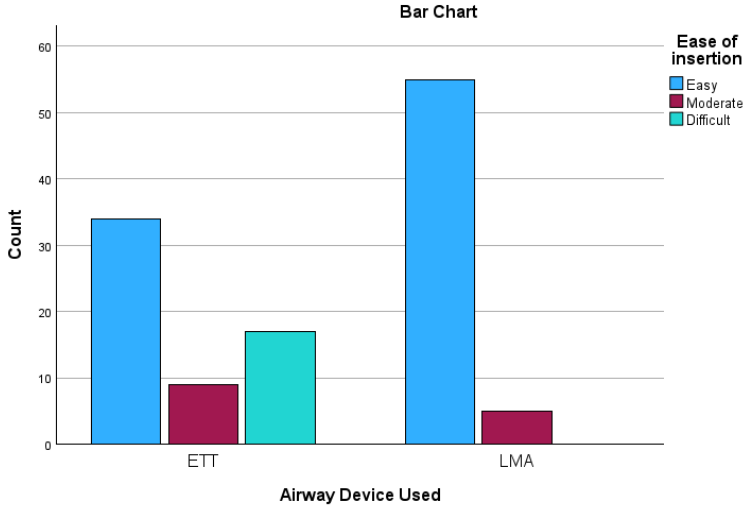


Figure 5 Bar chart for the variables Airway device used and Ease of Insertion

4.2.3 To Analyze the impact of Airway device used on the Occurrence of Laryngospasm

4.2.3.1 Hypothesis

H_0 = There is no association between the Airway device used and Occurrence of Laryngospasm

H_1 = There is Significant Association between the Airway device used and Occurrence of Laryngospasm

4.2.3.2 Level of Significance

P = <.001

4.2.3.3 Test Statistics

Fisher exact test (Chi-Square) was applied

4.2.3.4 Results

Table 8 Cross Tabulation for the Variables Airway device and occurrence of Laryngospasm

Airway Device Used * Occurence of Laryngospasm Crosstabulation

Count

		Occurence of Laryngospasm		
		Yes	No	Total
Airway Device Used	ETT	17	43	60
	LMA	0	60	60
Total		17	103	120

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Table 9 Analysis for Chi-Square Test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	19.806[a]	1	<.001		
Continuity Correction[b]	17.544	1	<.001		
Likelihood Ratio	26.386	1	<.001		
Fisher's Exact Test				<.001	<.001
Linear-by-Linear Association	19.641	1	<.001		
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.50.

b. Computed only for a 2x2 table

4.2.3.5 Conclusion

Cross Tabulation analysis between Airway device used and Occurrence of Laryngospasm shows that total sample size of 120 patients were equally divided into two groups of ETT and LMA, Among the 60 patients of ETT group 17 patients suffered from laryngospasm and remaining 43 reported no laryngospasm and Among the 60 patients of LMA group none patients suffered from laryngospasm.

Chi-Square test ($\chi 2$ = 19.806, p= <.001) shows that there is significant association between the variables Airway device used and Occurrence of Laryngospasm.

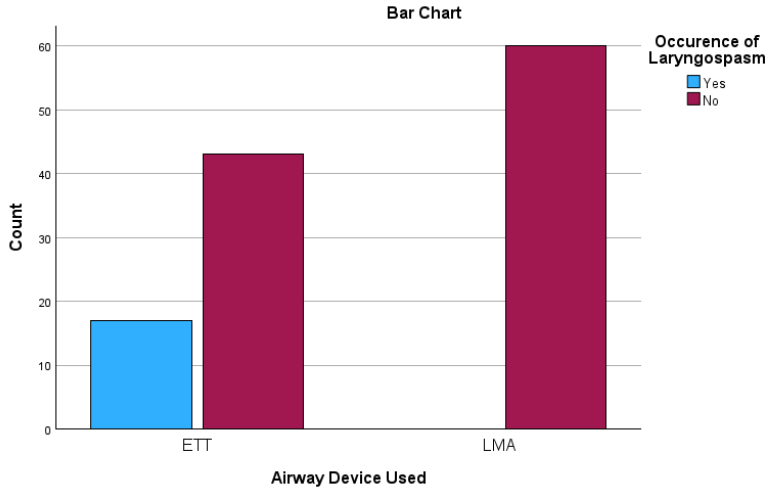


Figure 6 Bar chart for the variables Airway device used and Occurrence of Laryngospasm

4.2.4 To Analyze the impact of Airway device used on the Occurrence of Bronchospasm

4.2.4.1 Hypothesis

H_0 = There is no association between the Airway device used and Occurrence of Bronchospasm

H_1 = There is Significant Association between the Airway device used and Occurrence of Bronchospasm

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4.2.3.2 Level of Significance

P = <.001

4.2.3.3 Test Statistics

Fisher exact test (Chi-Square) was applied

4.2.3.4 Results

Table 10 Cross Tabulation for the variables Airway device used and Occurrence of Bronchospasm

Airway Device Used * Occurence of Bronchospasm Crosstabulation

Count

		Occurence of Bronchospasm		
		Yes	No	Total
Airway Device Used	ETT	19	41	60
	LMA	1	59	60
Total		20	100	120

Table 11 Analysis for Chi-Square Test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	19.440[a]	1	<.001		
Continuity Correction[b]	17.340	1	<.001		
Likelihood Ratio	23.043	1	<.001		
Fisher's Exact Test				<.001	<.001
Linear-by-Linear Association	19.278	1	<.001		
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.00.

b. Computed only for a 2x2 table

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4.2.4.5 Conclusion

Cross Tabulation analysis between Airway device used and Occurrence of Bronchospasm shows that total sample size of 120 patients were equally divided into two groups of ETT and LMA, Among the 60 patients of ETT group, 19 patients suffered from bronchospasm and remaining 41 reported no bronchospasm and Among the 60 patients of LMA group only one case of bronchospasm was reported.

Chi-Square test ($\chi 2$ = 19.806, p= <.001) shows that there is significant association between the variables Airway device used and Occurrence of Bronchospasm.

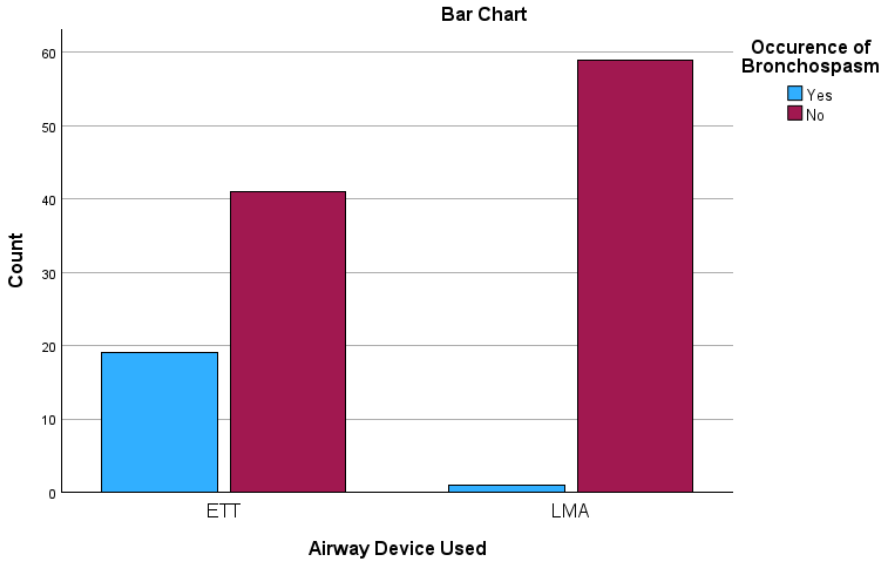


Figure 7 Bar Chart for the variables Airway device used and occurrence of Bronchospasm.

4.2.5 To Analyze the impact of Airway device used on Heart rate after insertion

4.2.5.1 Hypothesis

H_0 = There is no association between the Airway device used and Heart rate after insertion

H_1 = There is Significant Association between the Airway device used and Heart rate after insertion

4.2.5.2 Level of Significance

P = <.001

4.2.5.3 Test Statistics

Fisher exact test (Chi-Square) was applied

4.2.5.4 Results

Table 12 Cross Tabulation between the variables Airway device used and Heart rate after insertion

Airway Device Used * Heart rate after Insertion Crosstabulation

Count

		Heart rate after Insertion		
		Normal (60-100)	High (>100)	Total
Airway Device Used	ETT	45	15	60
	LMA	60	0	60
Total		105	15	120

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Table 13 Analysis for Chi-Square Test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	17.143[a]	1	<.001		
Continuity Correction[b]	14.933	1	<.001		
Likelihood Ratio	22.945	1	<.001		
Fisher's Exact Test				<.001	<.001
Linear-by-Linear Association	17.000	1	<.001		
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.50.

b. Computed only for a 2x2 table

4.2.5.5 Conclusion

Cross Tabulation analysis between Airway device used and Heart rate after insertion show that total sample size of 120 patients were equally divided into two groups of ETT and LMA, Among the 60 patients of ETT group, 45 patients had normal heart rate at after insertion, 15 had high heart rate after insertion and Among the 60 patients of LMA group, all of the participants had normal heart rate after insertion.

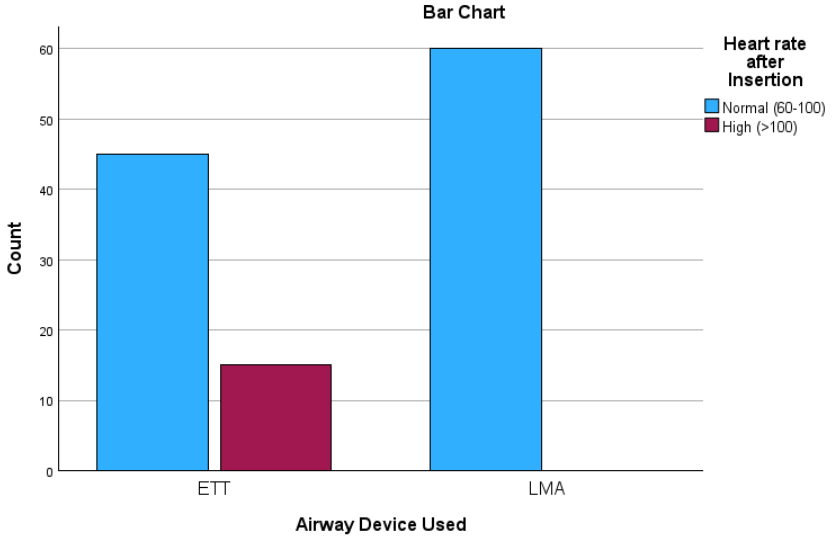


Figure 8 Bar chart for the variables Airway device used and Heart rate after insertion.

To Analyze the impact of Airway device used on Blood Pressure after insertion

4.2.6.1 Hypothesis

H_0 = There is no association between the Airway device used and Blood pressure after insertion

H_1 = There is Significant Association between the Airway device used and Blood pressure after insertion

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4.2.6.2 Level of Significance

P = <.001

4.2.6.3 Test Statistics

Fisher exact test (Chi-Square) was applied

4.2.6.4 Results

Table 14 Cross Tabulation between the variables Airway device used and Blood pressure after insertion.

Airway Device Used * Blood Pressure after Insertion Crosstabulation

Count

		Blood Pressure after Insertion		
		Normal (120/80-140/100)	High (>160/100)	Total
Airway Device Used	ETT	45	15	60
	LMA	60	0	60
Total		105	15	120

Table 15 Analysis for Chi-Square Test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	19.806[a]	1	<.001		
Continuity Correction[b]	17.544	1	<.001		
Likelihood Ratio	26.386	1	<.001		
Fisher's Exact Test				<.001	<.001
Linear-by-Linear Association	19.641	1	<.001		
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.50.

b. Computed only for a 2x2 table

4.2.6.5 Conclusion

Cross Tabulation analysis between Airway device used and Blood pressure after insertion show that total sample size of 120 patients were equally divided into two groups of ETT and LMA, Among the 60 patients of ETT group, 45 patients had normal Blood pressure after insertion, 15 had high blood pressure after insertion and Among the 60 patients of LMA group, all of the participants had normal blood pressure after insertion.

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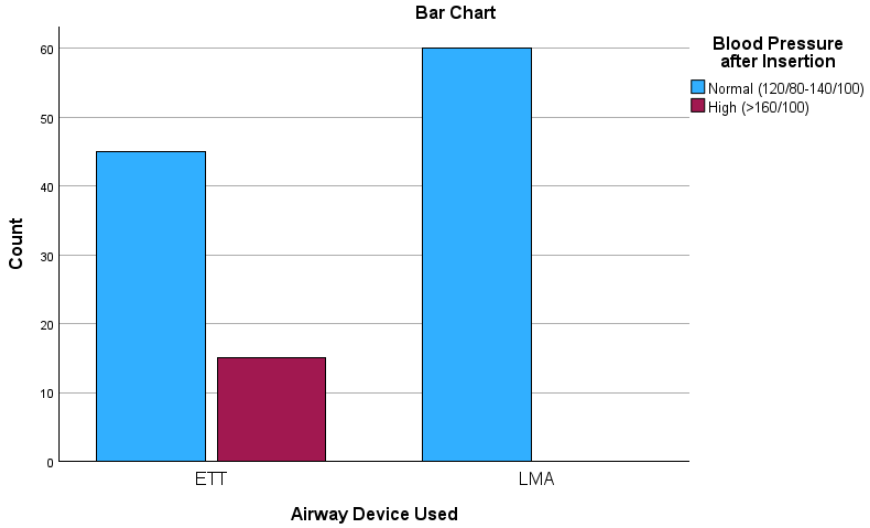


Figure 9 Bar chart for the variables Airway device used and Blood pressure after insertion.

4 DISCUSSION

The goal of our research was to make a comparison between the efficacy and safety of the ETT and LMA in patients that underwent an anesthetic procedure and experienced an upper respiratory tract infection (URTI). Demographic study revealed that the age of 25-35 years (39.2%), were mostly of the male gender (74.2%). The Mallampati Class I (78.3) was the highest percentage of the patients and hence the majority of the patients had a favorable airway with regards to intubation and LMA insertion. A previous study conducted by Diala Al Mardini et al. (2022) also highlighted this fact (9).

In the measurement of attempts to insert airways, the LMA was once again seen to have higher first-attempt success rate of 90% compared to ETT 71.6% and consequently LMA was a superior airway management option that was efficient and less technical expertise-demanding. Similarly, LMA has been inserted more easily where 91.6 percent of the insertions were easy and ETT required greater expertise where 28.3 percent of cases were considered moderate to difficult. Mona Mohammed et al (2024) emphasized on the effect of education and expertise on the outcomes when using either LMA or ETT in their study (3). Importantly, the results of the two categories of cases where no cases required the manipulation of the airways on the day of insertion, confirm the validity of both the techniques of airway maintenance. However, there were some notable differences in airway related complications. Bronchospasm was observed in 31.6 percent of the ETT cases and 0 percent LMA cases and laryngospasm was observed in 28.3% ETT cases and 1.6% larynx cases. These findings are a direct indication that LMA is associated with lesser airway reflex complications and this is particularly advantageous in patients with URTI where airway hyper reactivity is rampant. The majority of larynx and bronchospasms caused by ETT were induced during induction and the post-operative period, as is anticipated of an irritant procedure upon inflamed airways, tracheal intubation. Seyoum et al. (2023) also verified this fact in his study (6)

The hemodynamic parameters also showed a great difference in the two groups. The comparison of baseline heart rates and BP revealed that in both groups, they were mostly normal with tachycardia and hypertension being more prevalent in ETT patients (25% after insertion) and LMA patients stable with their vitals. This stimulation of the laryngeal and tracheal mucosa makes its application in this hemodynamic stability with LMA challenging because it is not as invasive and causes a lower stimulation of tracheal and laryngeal mucosa. In

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both groups, the level of oxygen saturation was not low at any given stage and this fact implied that both airway method of oxygenation were not impaired. Pravin Ubale et al. (2020) also concluded similar results results in their study (2). In sum, the data indicates that the LMA has significant advantages in terms of the convenience of use, minimized complications, and greater hemodynamic stability, without the necessity to decrease the ventilation sufficiency. The findings are consistent with the previous research findings that supraglottic devices like the LMA avoid airway irritation, sympathetic stimulation and especially with patients having a sensitive respiratory tract. A lot of previous literature such as Behrooz Zaman et al. (2020) has sumitted similar outcomes (4).

4.1 Summary

This research compared 60 ETT treated patients and 60 LMA treated patients regarding the performance of airways control and complications in patients whose URTI were treated. The LMA achieved better results related to the first-attempt success, penetration, and reduced cases of airway complications, including bronchospasm and laryngospasm. Airway devices both had sufficient ventilation and oxygen saturation, but LMA had more stable hemodynamic parameters throughout and after insertion. The results indicate that the LMA is safer and more efficient in comparison with ETT in URTI patients, which reduces airway reflex response and cardiovascular load and achieves an acceptable ventilation. Therefore, the airway device of choice in short elective operations or patients with a higher sensitivity to airway must be the LMA. Dr Yogesh Kumar et al. (2022) in his research also highlighted this point of LMA being more effective in short term elective procedures in his study (19).

5 CONCLUSION

This chapter interprets the quantitative data gathered through a questionnaire for the topic of Comparison between the use of Endotracheal Tube and Laryngeal Mask Airway in patients with Respiratory Tract Infections in the upper airway. The data for the ETT group was easily available because it is considered as a standard use of equipment in this kind of procedure. On the other hand the data of LMA was relatively difficult to gather because of infrequent use in this procedure. The findings of our research through our data collection suggest that although the use of Laryngeal Mask Airway is less frequent but it offers as a better and a more compatible equipment among the two. The results of the research suggests that LMA is less linked with Airway issues such as Laryngospasm and Bronchospasm despite the Age group. The results also show that LMA is less associated with Hemodynamic Fluctuations as compared to ETT. Along with that in the findings there was no evidence that suggested that LMA offers inadequate ventilation as compares to ETT. Overall our research concludes that LMA is as good of a equipment if not better than ETT and it's use in patients with Upper respiratory tract infections should be more frequent depending upon the kind of surgery. In order to achieve better outcomes and improve patient care.

The findings of our research through our data collection indicate that although the use of Laryngeal Mask Airway is not frequent but it offers as a better and a more compatible equipment among the two.

Our research concludes that LMA is as good of a equipment if not better than ETT and it's use in patients with Upper respiratory tract infections should be more frequent depending upon the kind of surgery. In order to achieve better outcomes and improve patient care.

4.2 Recommendations

Based on the study's result, we recommend that

- In the future authors should focuse on conducting Prospective research for detailed and establishing outcomes.
- We also recommend using Probability sampling technique for less biased selection of participants.

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6.3 Research Limitations

While this research provides impactful information into use of airway management equipment ETT and LMA in patients with upper respiratory tract infections. Their are certain limitations of this study

- This research included only quantitative data.
- Non Probability convenient sampling technique was used.
- Variables associated with LMA and ETT such as Airway pressure, leak pressure, Tidal volumes etc are not discussed in this study.

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