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# Effects of C-Mac Video Laryngoscope Aided Intubation Using D Blade on Incidence of Post-Operative Sore Throat

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***Abstract:*** ***Conclusion: C-MAC video laryngoscope-aided intubations using D-blade significantly reduced the incidence and severity of POST, hoarseness of voice, and cough following orotracheal intubation as compared to use of traditional Macintosh laryngoscope. Our evidence suggests that C-MAC video laryngoscopes reduce intubation failure and make intubation easier, particularly in patients with a predicted or known difficult airway, Also, it was found, use of C-MAC video laryngoscope helps anaesthetist to improve the glottic view and reduce the number of laryngoscopies in which the glottis cannot be seen. C-MAC may serve as a standard intubation device for both routine airway management and educational***
***Results: Our study was done in the Department of Anaesthesiology MM deemed to be university Mullana-Ambala Haryana. After approval from the competent ethical committee, Study includes 130 patients as per inclusion and exclusion criteria. Both groups were comparable with respect to demographic variables, distribution of ASA, Age, Sex, BMI, and Mallampatti grade. Percentage of patients who were intubated at the first attempt was similar among the groups. While Comparing the presence and absence of POST, cough, hoarseness of voice between the two groups. When compared with group A (Macintosh), total number of patients found having the above symptoms was found less in group B (C-MAC video laryngoscope).***
***Keywords: Sore throat, Laryngoscope, Preoperative complications, Endotracheal intubation, C-MAC video laryngoscope, Macintosh D balde.***

## I. INTRODUCTION

POST is the most common side effect in postoperative period. POST after endotracheal intubation is reported up to 14.4%-90% [(1, 2-3)]. The etiological factors of POST include airway mucosal irritation and inflammation. A study done by Chandler postulated mechanical trauma as a cause of POST and found a positive correlation between mechanical forces and postoperative sore throat [(4)].
Intubation is gold standard for general anesthesia as it decreases aspiration and helps to make the airway secure.
Direct laryngoscopy is the classic technique for tracheal intubation. But pharyngeal, laryngeal and tracheal axis are to be aligned, which can difficult to achieve in some patients and may be risky in patients with cervical spine injury. Recently video laryngoscopes have come into being for airway management [(5, 6)].



MACINTOSH LARYNGOSCOPE

The C-MAC is a video laryngoscope which has a camera and light source with use Macintosh laryngoscope edges of various sizes. It has a camera and light source situated in a place that is recessed from the tip of the edge. This laryngoscope ensures a better laryngeal view than direct laryngoscope without any need to align tracheal, pharyngeal, and laryngeal axis [(7, 8)]. During direct laryngoscopy there is adjustment of laryngeal pharyngeal & tracheal axis which needs application of force in the upward direction that's transmitted to the laryngoscope handle. This force is the transmitted to thee arytenoid ligaments of larynx that harms the mucosa of the airway leading to glottic injury and postoperative sore throat [(9)].

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On the other hand C-MAC video laryngoscope needs smaller head control and larynx is quickly perceived compared to direct laryngoscopy with Macintosh [10] also less force on maxillary incisors is exerted.




C-MAC Video LARYNGOSCOPE

Endotracheal intubation using C-MAC needs less force as no need to align the three axis which may account for lesser airway mucosal damage. Hence we decided to compare C-MAC video laryngoscope with direct Macintosh laryngoscope for incidence and severity of postoperative sore throat [11].

C-MAC video laryngoscope has an advantage in being a method to improve visualization of glottis and the success of Orotracheal intubation over traditional Macintosh laryngoscope. Video laryngoscope also appears to reduce the number failed intubation in patients with a difficult airway [12].

C-MAC has the added advantage over conventional Macintosh laryngoscope with shorter handle and video screen in providing real time display [13].

Also numbers of attempts at intubation are greatly reduced with C-MAC video laryngoscope. Visualizing is often difficult in ICU due to limitation of airway space, the position of the patient and the associated co morbidities [14] difficult intubation ranges from 10-22% in critically ill patients [15]. This is decreased by using C-MAC video laryngoscope.

The risk of hypoxia, esophageal aspiration and cardiac arrest can be reduced through use of C-MAC video laryngoscope [16].

*A. Aim and Objective of this Study*

To determine the incidence and severity of POST 2 hour, 6 hour, 12 hour and 24 hour post-extubation.
To determine the incidence and severity of cough 2 hour, 6 hour, 12 hour and 24 hour post-extubation.
To determine the incidence and severity of hoarseness of voice 2 hour, 6 hour, 12 hour and 24 hour post-extubation.
To grade the severity of post operative sore throat.

*1) Inclusion Criteria*

Patients in age group of 18- 50 years.
1 & 2 ASA grades.
Informed written consents.
Elective surgery under GA of duration between 0.5hr and 2hr.

*2) Exclusion Criteria*

Difficult airway management (Mallampati 3 and 4)
Earlier history of difficult intubation.
Pregnant patient.
Respiratory tract disease patients.
Patients whose surgery requires more time (2 hours)
Use of Ryles tube or throat pack
Patients on steroid and NSAIDS.

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## II. METHODOLOGY

Our study shall enroll 130 numbers of patients. This number shall compare of two groups, viz.
Group A 65 patients intubated with Macintosh laryngoscope and,
Group B 65 patients with C-MAC video laryngoscope.
After regular pre anesthetic checkup, Patient was kept nil per mouth for 8 hours and next day in the operation theatre routine parameters will be attached on the multipara monitor. Patients will be Pre-medicated with IV (o.2mg) glycopyrolate, (1mg) midazolam and (2 µg/kg) fentanyl. Post 3 min of pre-oxygenation, propofol (2 mg/kg) and ventilation with isoflurane and succinylcholine 2 mg/kg. laryngoscopy will be done using Macintosh and C-MAC video laryngoscope with D-blade and intubated with endotracheal tube with 8mm (inner diameter) in the case of male patients and 7mm ID in female's patients. Correct endotracheal tube placement will be confirmed with end-tidal capnograph and auscultation measured by using AMBU manometer (cuff Pressure was fixed in between 20-22cm of $H_2O$).
After completion of surgery, reversal will be done with injection neostigmine 0.05mg per kilogram and glycopyrrolate 0.01mg/kg. Patients were extubated and shifted to postoperative recovery room and monitored till 24hrs.
Our study was finished after 24 hrs.

## III. DISSCUSSION

Most common complication following ET tube insertion is considered to be POST; patients found it distressing. The incidence rates vary, but could be as high as 90%. Factors responsible for POST are airway trauma during laryngoscopy, mucosal damage caused by ET tube. Few more maybe responsible are as follows
Intubation without muscle relaxants.
Double-lumen tubes if used.
High cuff pressures.
Size of ETT.
Cuff pressure if exceeds.
Number of attempts, and
Type of surgeries. [17, 19].
Muscle relaxant type
Smoking habit [20–23].
Age, Sex, BMI, number of attempts of intubation and duration of surgery, no such significant difference was there.
The main finding of this thesis was POST, hoarseness, and cough are common adverse events affecting almost half of the patients after GA. The symptoms are most common in the early postoperative period, but they can last several days postoperatively. Both men and women report discomfort from POST.
Our main results show that overall incidence of POST was high with MCL compared to C-MAC video laryngoscope. While our study emphasizes decreased incidence of POST after 12 hours and 24 hours respectively.
Our findings are consistent with the finding of other authors like Pulak Tosh, Dilesh Kadapamannil, et al and with the findings of Erol Cavus1 et al who observed comparison of the C-MAC video laryngoscope with direct laryngoscopy in 150 patients during routine induction of anaesthesia.
Pulak Tosh, Dilesh Kadapamannil et al studied Effect of C-MAC Video Laryngoscope-aided Intubations Using D-Blade on Incidence and Severity of Postoperative Sore Throat on 130 patients undergoing short elective laparoscopic surgeries and both groups were comparable with respect to demographic variables, distribution of ASA, physical status, and Mallampatti score. Whule comparing the presence or absence of POST, hoarseness of voice, and cough among the groups, it was found that as compared to Group M, number of patients who had these symptoms was significantly low in Group V at 2, 6, 12, and 24 h [$P < 0.001$] Severity, as well as the incidence of POST, showed a downward trend in both groups with time and by 24 h no patient in Group V had sore throat. The conclusion was C-MAC video laryngoscope-aided intubations using D-blade significantly reduced the incidence and severity of POST, hoarseness of voice, and cough following orotracheal intubation as compared to use of traditional Macintosh laryngoscope.
Erol Cavus[1], Carsten Thee[2] et al studied controlled crossover comparison of the C-MAC videolaryngoscope with direct laryngoscopy in 150 patients during routine induction of anaesthesia on 150 patients (ASA I-III) with general anaesthesia. Reading was found on 150 patients and finding was found no difference of glottic view between Macintosh laryngoscope and C-MAC video laryngoscope. However, worst glottic view was only seen with direct laryngoscope, but not with C-MAC video laryngoscope.

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However Gurchand Singh1 • Anisha Puri2 studied POST on adult patients after ET insertion in ear surgeries using Intravenous Dexamethasone Preoperatively to decrease the incidence of POST. While no significant difference in the patient characteristics including age, sex, BMI, number of attempts of intubation and duration of surgery which were found to be comparable in both the groups. They found minimal sore throat after use of dexamethasone in adult patients. While they concluded on use of Dexamethasone 0.2 mg/kg I.V before endotracheal intubation significantly decrease the incidence of sore throat in patients.

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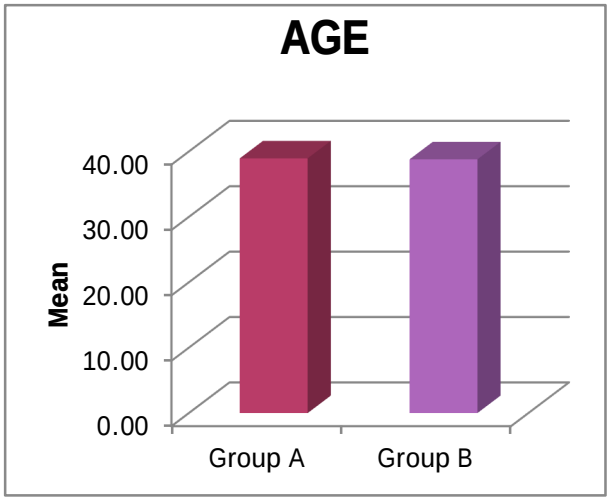
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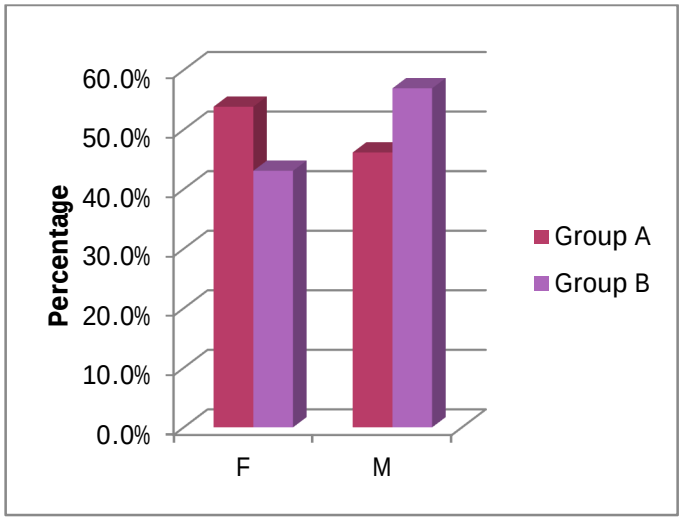
## RESULT AND FINDINGS

TABLE 1: Distribution of Age with p-value 0.919, Sex with p-value 0.219 BMI with p-value 0.059, Number of intubating attempts with p-value 0.457, MPG grades [I & II] with p-value 0.276 and ASA grade of 1 and 2 with p-value 0.378 were comparable in both the groups while the difference remained non-significant.

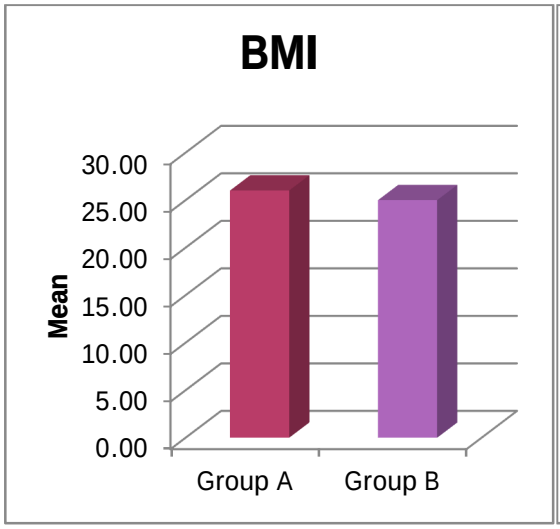
| | Group A | | Group B | | p-value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| AGE | 38.95 | 8.00 | 38.80 | 9.20 | 0.919 |
| SEX (F:M) | 35:30 | 53.8% :46.2% | 28:37 | 43.1% : 56.9% | 0.219 |
| BMI | 26.01 | 2.87 | 25.00 | 2.79 | 0.059 |
| NO OF INTUBATION ATTEMPTS | 1.14 | 0.35 | 1.20 | 0.44 | 0.457 |
| MPG [I & II] MEAN | 21:44 | | 27:38 | | 0.276 |
| **ASA 1 & 2 MEAN** | **39:26** | | **33:32** | | **0.378** |

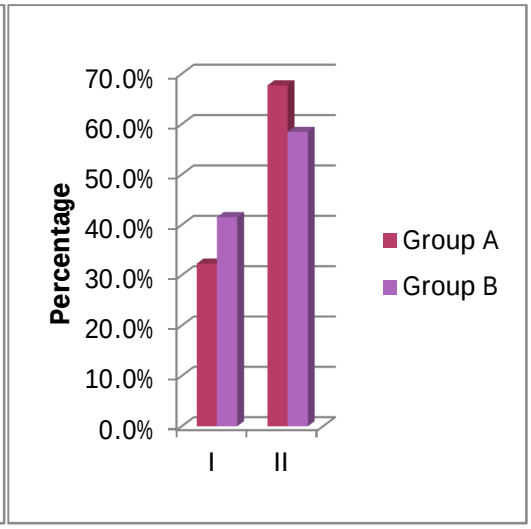
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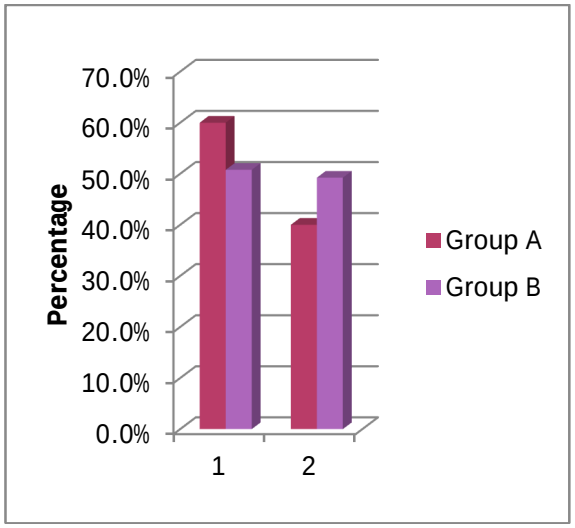




Sex Graph



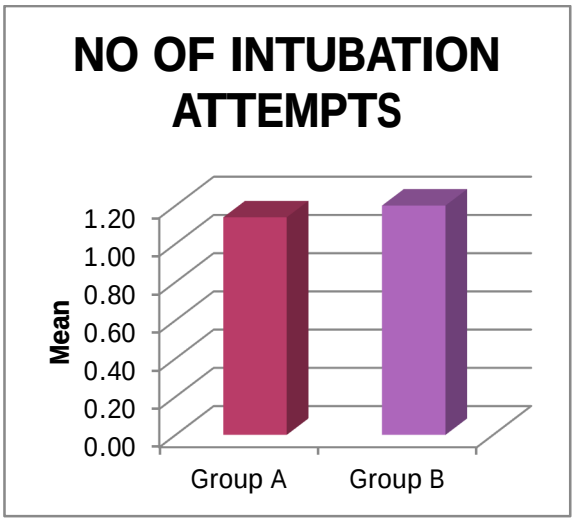




MPG Graph

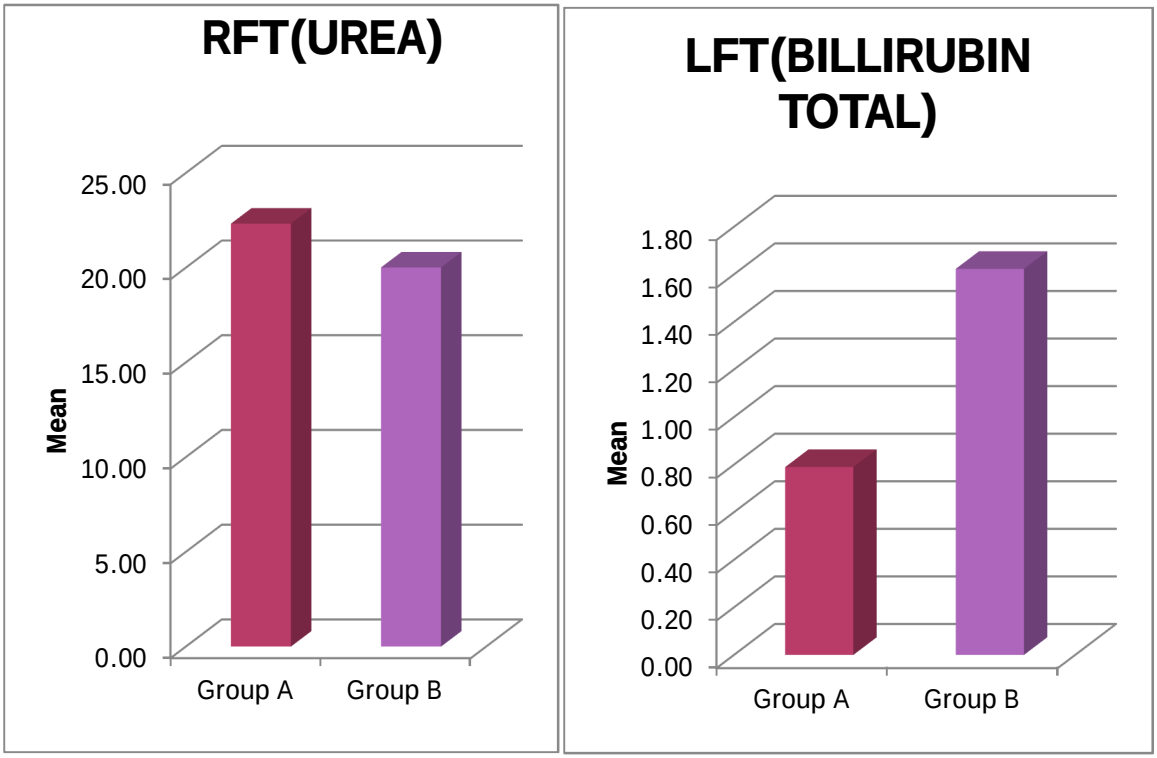



Graph of ASA Grade

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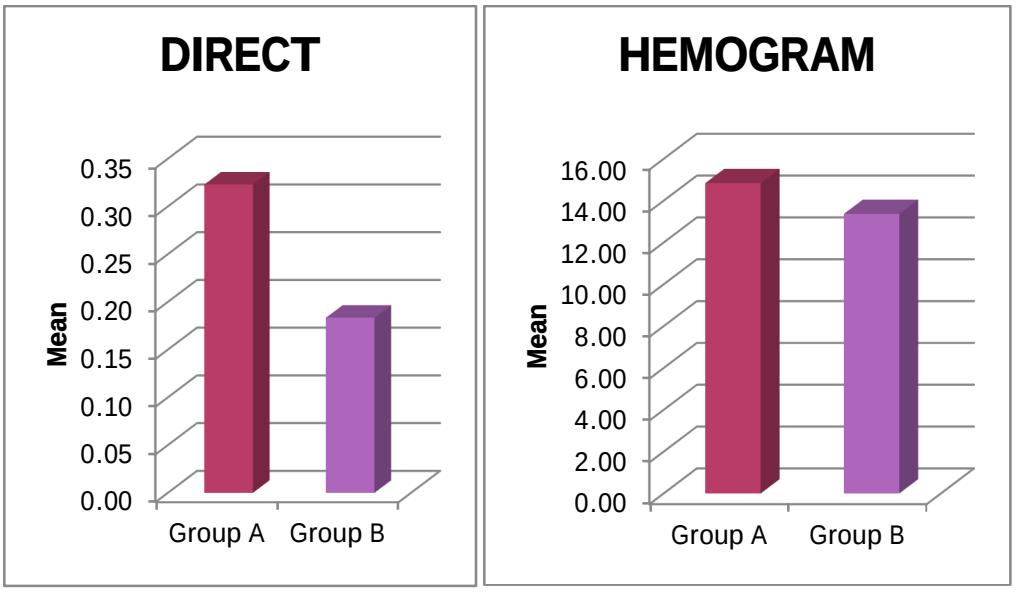



| | Group A | | Group B | | Z | p-value |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| RFT(UREA) | 22.32 | 10.06 | 20.01 | 5.92 | -1.379 | 0.168 |
| LFT(BILLIRUBIN TOTAL) | 0.79 | 1.15 | 1.62 | 7.87 | -0.037 | 0.970 |
| DIRECT | 0.32 | 0.71 | 0.18 | 0.19 | -1.372 | 0.170 |
| HEMOGRAM | 14.84 | 12.43 | 13.37 | 1.65 | -0.415 | 0.678 |
| BLOOD SUGAR | 107.54 | 33.16 | 105.30 | 32.84 | -0.170 | 0.865 |




GRAPHICAL VIEW

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GRAPHICAL VIEW

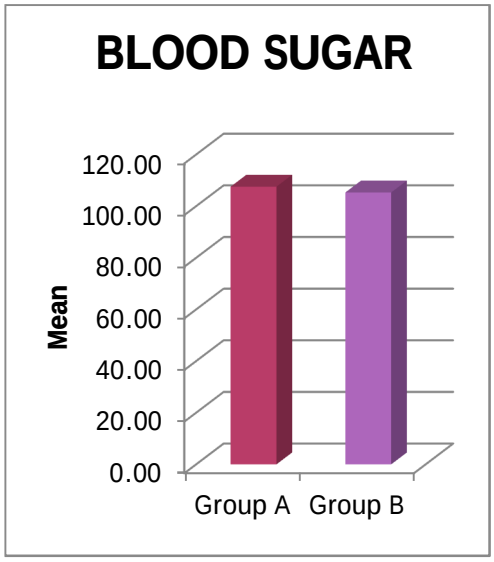
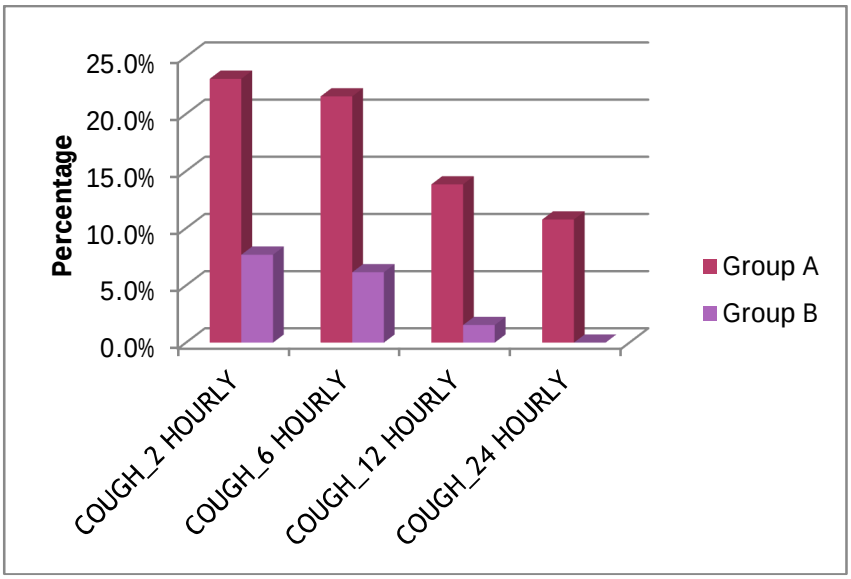



Table: 3 Post Extubation Cough

| Incidence of post operative cough | Group A | Group B | P- value |
|---|---|---|---|
| After 2 hours of post extubation | 15 | 5 | 0.015 |
| After 6 hours of post extubation | 14 | 4 | 0.011 |
| After 12 hours of post extubation | 9 | 1 | 0.017 |
| After 24 hours of post extubation | 7 | 0 | 0.013 |

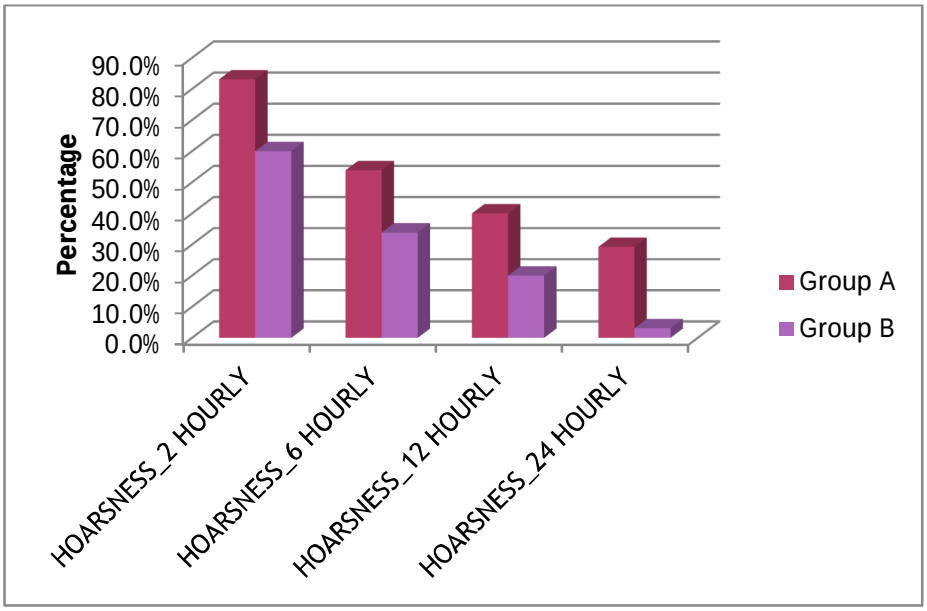
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GRAPHICAL VIEW

TABLE: 4 HOARSENESS OF VOICE

| Incidence of hoarseness of voice | Group A | Group B | P-value |
|---|---|---|---|
| After 2 hours of post extubation | 54 | 39 | 0.006 |
| After 6 hours of post extubation | 35 | 22 | 0.033 |
| After 12 hours of post extubation | 26 | 13 | 0.021 |
| After 24 hours of post extubation | 19 | 2 | 0.0001 |

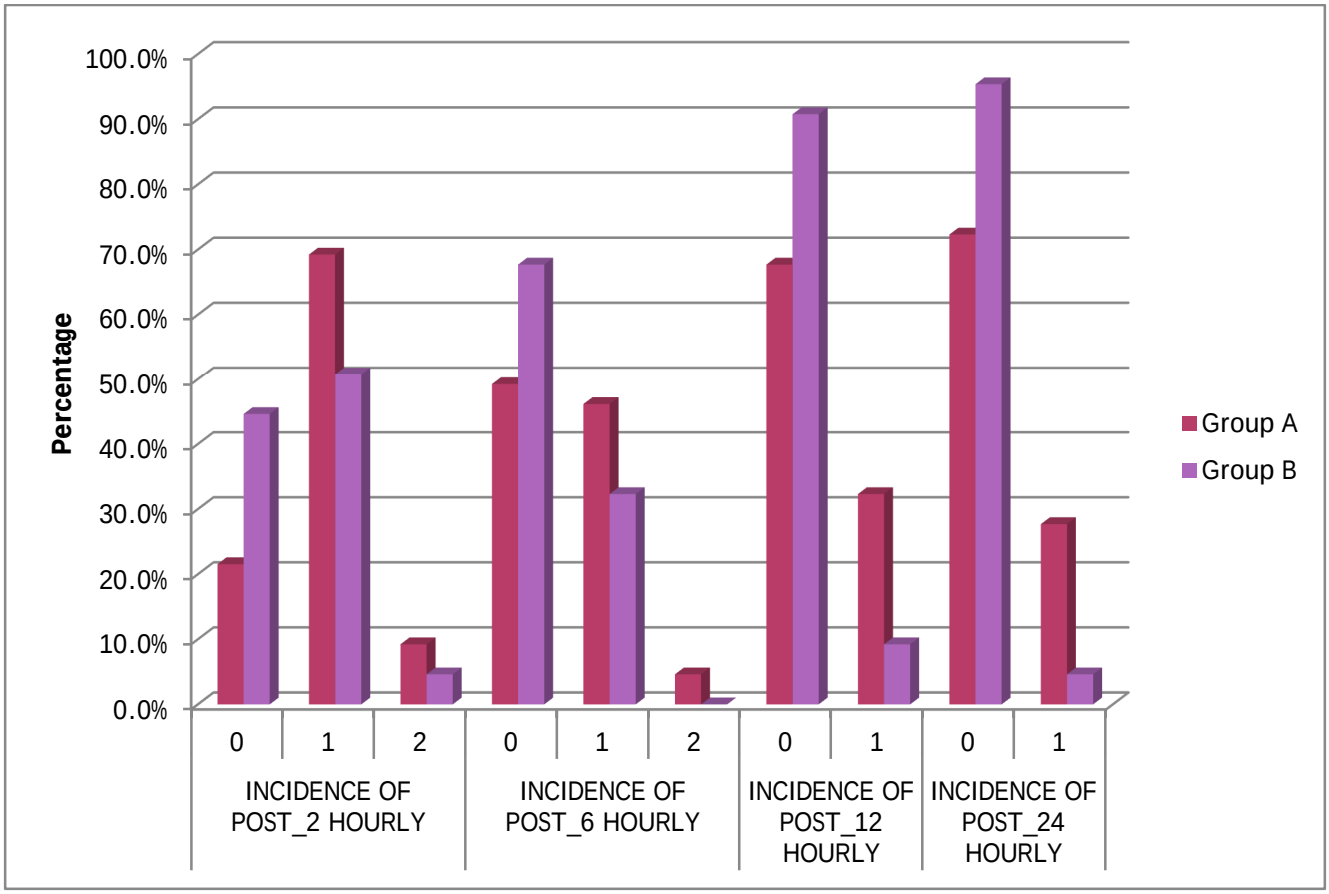



GRAPHICAL VIEW

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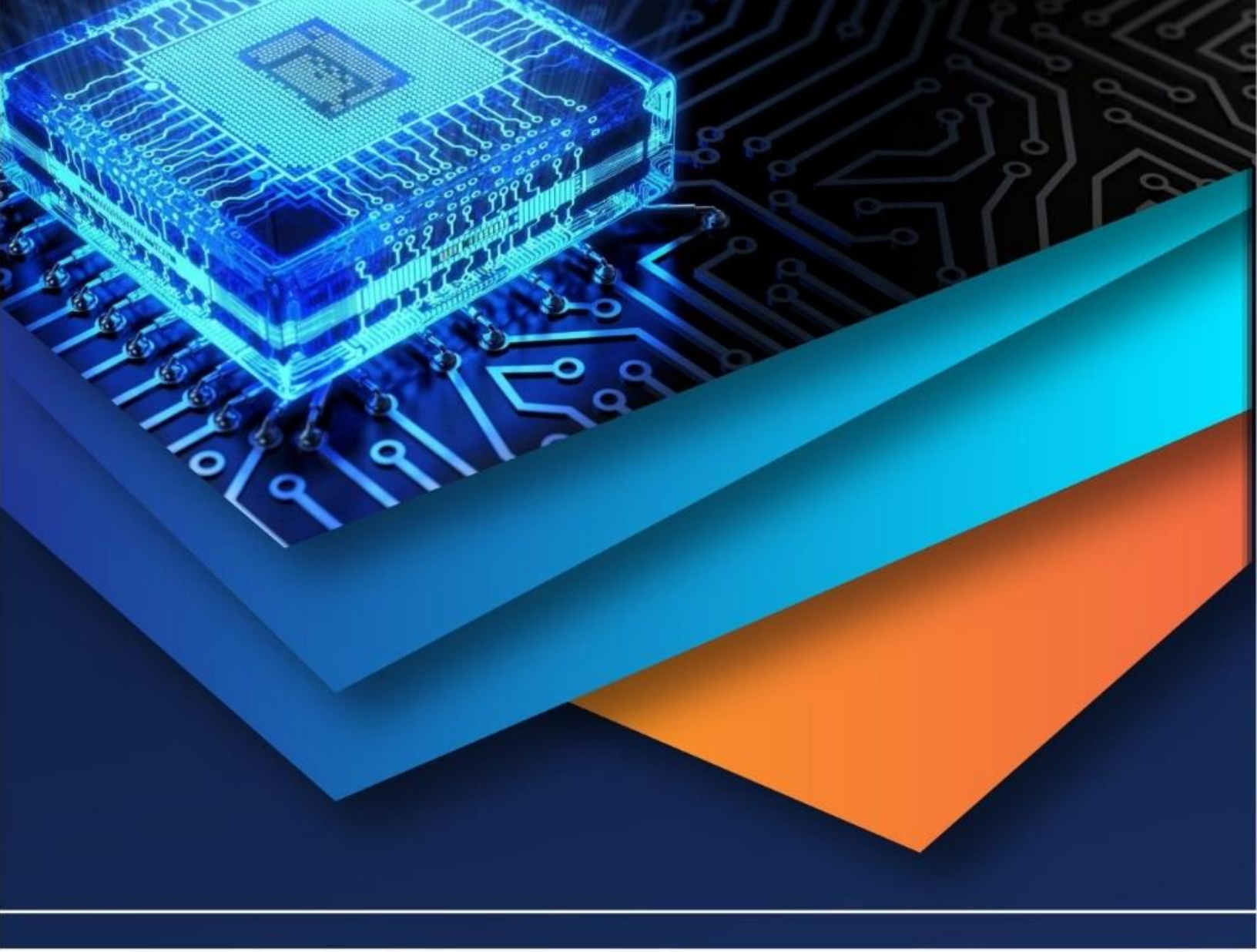
| **Incidence of POST** | **Grading** | Group A | Group B | p-value |
|---|---|---|---|---|
| After 2 hours of post extubation | 0 (No sore throat) | 14 | 29 | 0.018 |
| | 1 (Mild) | 45 | 33 | |
| | 2 (Moderate) | 6 | 3 | |
| After 6 hours of post extubation | 0 (No sore throat) | 32 | 44 | 0.039 |
| | 1 (Mild) | 30 | 21 | |
| | 2 (Moderate) | 3 | 0 | |
| After 12 hours of post extubation | 0 (No sore throat) | 44 | 59 | 0.002 |
| | 1 (Mild) | 21 | 6 | |
| After 24 hours of post extubation | 0 (No sore throat) | 47 | 62 | 0.001 |
| | 1 (Mild) | 18 | 3 | |

TABLE: 5 ICIDENCE OF POST OPERATIVE SORE THROAT.




Graphical Analysis

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