



A RANDOMISED CONTROL TRIAL FOR COMPARISON OF BOUGIE GUIDED NASOTRACHEAL INTUBATION VERSUS CONVENTIONAL TECHNIQUE-IN ADOLESCENT & ADULTS

Anaesthesiology

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ABSTRACT

BACKGROUND& AIMS: Nasotracheal intubation provides better isolation and good surgical accessibility for intraoral procedures. The tube is more secure and has lesser risk of kinking due to airway instrumentation. The purpose of the study is to compare the safety and efficacy of Bougie guided versus conventional technique of nasotracheal intubation.

MATERIAL & METHOD: After approval from Ethical Committee of Institution patients were randomly allocated into two groups (30 patients each).

Group B: Patients in which nasotracheal intubation done using bougie.

Group C: Patients in which nasotracheal intubation done using conventional technique.

Nasal Bleeding, time taken for intubation, first attempt success, need of magill forceps, incidence of cuff rupture and hemodynamic changes before and after intubation were noted.

RESULT: The number of patients with nil, mild, moderate and severe bleeding degrees, respectively, were 17 (56.6%), 9 (30%) and 4 (13.33%) and 0 in Group B and 9 (30%), 12 (40%), 7 (23.33%) and 2 (6.66%) in Group C ($p < 0.05$). The first pass success rates were 90% in Group B and 67% in Group C ($p < 0.05$). The time taken for successful intubation was 57.47 ± 4.46 Sec and 40.06 ± 4.34 Sec in group B and C ($P < 0.0001$), need of magill forceps was 23.33% in group B & 80% in group C ($p < 0.05$) and incidence of cuff rupture was 3.33% in group B & 6.66% in group C ($p > 0.05$) respectively.

CONCLUSION: There were less chance of nasal trauma/bleeding, high first attempt success, lesser need of magill forceps and less chance of cuff rupture in bougie group as compare to conventional group. However comparatively more time was taken in intubation in bougie group.

KEYWORDS

#Nasotracheal intubation #conventional intubation #Bougie

INTRODUCTION:

Nasotracheal intubation is routinely done for several head and neck surgeries to facilitate easy surgical access to the oral cavity or when difficult Orotracheal intubation is anticipated. Nasotracheal intubation involves the tracheal tube to pass through nose hence allowing better isolation and good surgical accessibility for intraoral procedures.

Nasal intubation technique was first described in 1902 by Von Franz Kuhn. During the 1st world war Rowbotham and Magill developed and practiced the technique of "Blind nasal intubation" and coined the term. Conventional nasotracheal intubation technique are known to be associated with significant trauma to the patient nares and chance of cuff rupture. Alternatively Nasotracheal intubation over bougie promises not only to be less traumatic to the patient but also have higher first attempt success rate and less chance of tracheal tube cuff rupture.

Therefore this prospective study was planned to safely securing a nasotracheal tube and evaluate the reduction in complication which may occur in conventional technique.

MATERIAL & METHODS:

The study was carried out in S.R.N. Hospital associated with M.L.N. Medical College, Allahabad (Prayagraj), after approval from Ethical Committee of the Institution and obtaining written and informed consent from the patient.

SAMPLE SIZE & SELECTION OF CASES:

60 adolescent and Adult patients of either sex between age 15 to 60 years, belonging to American Society of Anaesthesiologist (ASA) Grade I-II, scheduled for elective surgeries with an anaesthetic plan for Nasotracheal intubation were recruited for this study, divided into 2 groups 30 of each, after thorough clinical and routine laboratory examinations.

SAMPLING METHOD:

After randomization patients will be allocated in one of the following groups

Group B : Patients in which Nasotracheal intubation done using Bougie

Group C : Patients in which Nasotracheal intubation done using Conventional technique.

EXCLUSION CRITERIA:

- 1) Patient refusal
- 2) Patients age < 15 or > 60 yrs.
- 3) Patient with ASA III And above.
- 4) Patient needing emergent airway protection.
- 5) Patient undergoing emergent surgery.
- 6) Patient who are known to be pregnant.
- 7) Patient who are currently on anticoagulant
- 8) History of hypersensitivity reactions to any of study medication.

In pre operative assessment : general & systemic examination airway assessment, pre op fasting of minimum 6 hrs was ensured. Baseline monitor were attached and Pulse, Respiratory rate, Arterial oxygen saturation, Ecg, Capnography, Systolic, Diastolic and M.A.P were monitored. All patients were premedicated with i.v Midazolam 0.01mg/kg, Glycopyrrolate 0.01mg/kg, Ondansetron 4mg, Ranitidine & Fentanyl 1µg/kg and nasal decongestants (Oxymetazoline) & Lignocaine jelly administered 15 minutes before the procedure. Patients were pre-oxygenated for 3-5 minutes with 100% oxygen. Induction of anaesthesia was done with 1.5-2.5 mg/kg Propofol (mixed with 2ml 1% i.v. Lignocaine) and Succinylcholine 2 mg/kg i.v. fast. Patients were ventilated with bag and mask for 60 seconds followed by nasotracheal intubation done.

In **Group B**, a bougie (flexible bougie of 4mm diameter and 700 mm length) was gently introduced through the selected nostril till it reaches the oropharynx. A Macintosh blade was introduced and under direct vision; bougie is advanced through the glottis. The endotracheal tube of appropriate size was threaded over the bougie into the glottis under direct vision.

Group C was intubated conventionally with the help of Magill's forceps. with gentle steady pressure, tube inserted & directed towards posterior nasopharynx, when tube reached the oropharynx, manipulation of tube with magill's forcep and laryngoscope was done to facilitate its movement into trachea.

Bleeding was assessed using a subjective scale as

0=No bleeding,

1=Minimal bleeding: not requiring suctioning,

2= Moderate bleeding : requiring suctioning but not hampering visualisation,

3= Severe bleeding: requiring suctioning and hampering the vis...ualisation.

All patients were intubated by same operator . The time taken for the intubation, number of attempts and hemodynamic changes before and after intubation and any other complications were also noted.

Statistical analysis

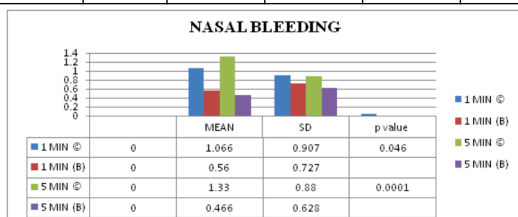
Statistical analysis was performed using Microsoft Excel 2010 and Continuous data was analyzed by ANOVA. Mann-Whitney U test was used to compare ordinal data (Degree of bleeding), and the Student's t test was used to analyse parametric data (time taken for intubation, number of attempts). Categorical data was compared using Chi - Squared test and Fishers Exact test for smaller values (less than 5) in contingency tables. An alpha error of 5% was used, Data are being represented as mean $\pm$ SD. $P < 0.05$ was considered statistically significant and $P < 0.001$ was considered statistically highly significant

OBSERVATION:

1. Baseline vital signs- Blood pressure, Pulse rate, Oxygen saturation ,Electrocardiogram, Mean blood pressure.
2. Nasal trauma {bleeding} [time frame: 1 min and 5 min post intubation
3. Time taken for intubation [time frame : measured immediately post intubation]
4. First attempt success rate. [time frame : measured immediately post intubation]
5. Need for Magill forceps [time frame : measured immediately post intubation]
6. Incidence of cuff rupture during intubation

TABLE: 1.NASAL TRAUMA/BLEEDING

BLEEDING	GROUP C (N=30)		GROUP B (N=30)		P VALUE
	MEAN	SD	MEAN	SD	
AT 1 MIN	1.066	0.907	0.56	0.727	0.046
AT 5 MIN	1.33	0.88	0.466	0.628	0.0001

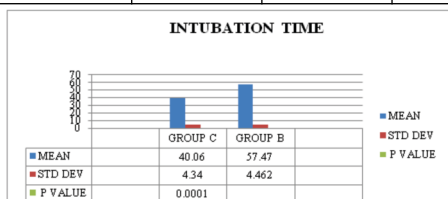


Comparison of Nasal Bleeding

INFERENCE: Incidence of Nasal trauma and severity of nasal bleeding was found to be more in conventional group in comparison of bougie guided group. This observation is statistically significant. ($p < 0.05$).

TABLE :2.TIME TAKEN FOR INTUBATION:

TIME TAKEN FOR INTUBATION (SEC)	MEAN	STD DEV	P VALUE
GROUP C	40.06	4.34	$P < 0.0001$
GROUP B	57.47	4.462	

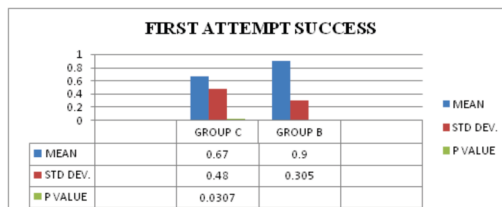


Comparison of time taken in Intubation

INFERENCE: Time taken in intubation was more in Group B as compared of Group C. Which was found to be statistically significant. ($p < 0.0001$)

TABLE-3.:FIRST ATTEMPT SUCCESS/ INTUBATION IN FIRST ATTEMPT

	NO OF PT.	MEAN	SD	P VALUE
GROUP C	20/30	0.67	0.48	0.0307
GROUP B	27/30	0.9	0.305	

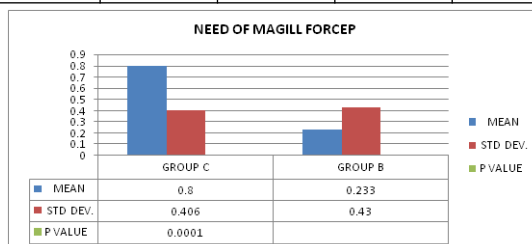


Comparison of First Attempt Success

INFERENCE: First attempt success rate more in group B as compared to Group C. Number of attempt taken was less in group B in comparison of conventional group. There is statistically significant difference in both group. ($p < 0.05$)

TABLE-4: NEED OF MAGILL FORCEP:

	NO OF PT.	MEAN	STD DEV.	P VALUE
GROUP C	24/30	0.80	0.406	< 0.0001
GROUP B	6/30	0.233	0.430	

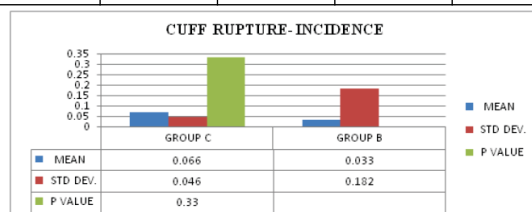


Comparison of Need of Magill Forcep

INFERENCE: Need of magill forcep during intubation was more in Group C as compared to Group B. Which is statistically very significant. ($p < 0.0001$).

TABLE -5 :INCIDENCE OF CUFF RUPTURE:

	NO OF PT.	MEAN	STD DEV.	P VALUE
GROUP C	2/30	0.066	0.046	0.165
GROUP B	1/30	0.033	0.182	



Comparison of Incidence of Cuff Rupture

INFERENCE: Incidence of cuff rupture during intubation was more in conventional group in comparison of Group B. This is statistically not significant. ($p > 0.05$)

DISCUSSION:

Nasal intubation is routinely done for several head & neck surgeries to facilitate easy surgical access to the oral cavity.

According to our study patients in which nasotracheal intubation was done using bougie having less hemodynamic changes, less chance of nasal trauma, high first attempt success rate, taking slightly more time in intubation, having less need of magill forcep and less incidence of cuff rupture.

According to **Vadhanan P, Tripathy DK et al (2018):** In a study about "Effect of bougie guided nasal intubations upon bleeding". The degree of bleeding was lesser in the bougie guided group than in the

conventional group($p=0.02$),and the time taken for intubation was longer in the bougie guided group($p<0.01$)

PejmanPourfakhr, FarhanEtezadi et al (2018) – In a study about “ Comparison of nasal intubations by glidescope with and without a bougie guide in patients who underwent Maxillofacial surgeries : Randomized Control Trial” The incidence of bleeding in the GEB group was 1.81% vs 43.63% in the routine group ($P < 0.001$). In 5.5% of the GEB group, Magill forceps were used to advance the tube versus 67.3% in the routine group ($P < 0.001$). The mean time for intubation in GEB group was 48.63 ± 8.53 vs 55.9 ± 10.76 seconds in the routine group ($P < 0.001$).

Our study was also in accordance of this study,that the degree of bleeding was lesser in bougie guided group in comparison to conventional group($p=0.04$),and the time taken for intubation was longer in the bougie group(57.47 ± 4.462 Vs 40.06 ± 4.34)($p < 0.0001$).

CONCLUSION

1. Demographically,age,sex,weight,height,type and number of surgery in both groups were comparable.
2. Nasotracheal intubation with the aid of Bougie having , less nasal trauma and Bleeding(0.56 versus 1.06) , high first attempt success rate and less no. of attempt(0.90 versus 0.67) , more time taken(57.47 versus 40.06) ,less need of magillforcep(0.23 versus .080), less incidence of cuff rupture(0.033 versus 0.066) observed as compared to conventional technique.

Hence it is concluded that bougie guided Nasotracheal intubation is suitable and a safe alternative to conventional method for airway management in elective head & neck and oropharyngeal surgeries under general anaesthesia.

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