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RESEARCH ARTICLE

EFFECTS OF STEAM INHALATION ON PATIENTS RECEIVING STEAM AND PATIENTS NOT RECEIVING STEAM PRIOR TO INTUBATION

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ABSTRACT

Background: Endotracheal intubation is a rapid, simple, safe &non surgical technique that maintains airway patency, protects the lungs from aspiration & permits leak free ventilation &remains the gold standard procedure for airway management. There are also several alternatives including LMA & the combitube. Both ETI & the use of the other airways are associated with complications. Preventable complications are Sore throat, Cough, Tracheitis, Laryngeal oedema, Hoarseness &Nerve injury.Here we compared Effects of steam inhalation on patients receiving steam and patients not receiving steam prior to intubation.

Material methods: This study was carried out in Department of Anesthesiology, AVBRH Sawangi from August 2015 - June 2016. 60 ASA class I-II patients aged between 20-50 yrs,scheduled for Endotracheal Intubation in General Anesthesia. Patients was divided into two groups S & C of 30 each.Patients of group "S" received steam inhalation half an hour prior to surgery &group "C" did'nt receive steam. Patients were observed intra-operatively, in recovery room & ward for any complication like sore throat, cough, tracheitis, hoarseness, laryngeal oedema etc. and were treated accordingly upto 24 hrs.

Results and Conclusion: In our study we found the incidence of complications are quiet significant in patients not receiving steam. Hence from our study we conclude that steam inhalation prior to endotracheal intubation is beneficial to the patients in preventing complication like sore throat, tracheitis, laryngeal oedema, cough & hoarseness.

INTRODUCTION

Airway management is a fundamental aspect of anaesthetic practice and of emergency and critical care medicine. Endotracheal intubation (ETI) is a rapid, simple, safe and non surgical technique that achieves all the goals of airway management, maintains airway patency, protects the lungs from aspiration and permits leak free ventilation during mechanical ventilation, and remains the gold standard procedure for airway management. There are also several alternatives to ETI, both for elective airway management as well as for emergency airway management when ETI is difficult or has failed. These devices include the laryngeal mask airway and the combitube. Both ETI and the use of the other airways are associated with complications, some of them are life threatening. It is essential for anaesthesiologists to be aware of these complications, and to have an effective strategy to prevent and manage these complications when they arise.

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A large number of complications have been reported out of which the common Preventable complications are Sore throat, Cough, Tracheitis, Laryngeal oedema and Hoarseness. A study was therefore carried out to compare "Effects of steam inhalation on patients receiving steam and patients not receiving steam prior to intubation".

Aims and Objectives

To study and compare the Benefits of steam inhalation on patients receiving steam Inhalation and in the patients not receiving steam Inhalation prior to intubation.

MATERIAL AND METHODS

The present study was carried out in the department of Anaesthesiology AVBRHSawangi from August 2015 – June 2016. Hospital ethics committee approval and written informed consent from patients were obtained. The preoperative anaesthetic evaluation was done using history,

general and systemic examination and routine investigation like CBC, ESR, X-ray chest PA view and blood urea nitrogen.

Inclusion Criteria

- ASA 1 and 2 patients undergoing surgeries under General Anaesthesia.
- All the patients willing to give consent
- age group 20 to 50 years
- Weight > 40 kg.
- Height > 140cm.

Exclusion Criteria

- ASA grade III and IV patients.
- Patients not willing to give consent..
- Patients below 20 yrs of age and above 50 yrs of age.
- Patients having any Oral carcinoma, face trauma, unconscious patients etc.

Patients were randomly allocated through computer generated method into two groups S & C of 30 each.Selected patientswere secured withIV cannula in the contralateral hand and routine monitors were attached before performing the procedure i.e pulse oximetry, NIBP, ECG.

Group S: Patients receiving steam inhalation.
Group C: Patients not receiving steam inhalation (Control).

Patients with history of URTI, Bronchial asthma, Vocal cords paralysis, Restricted TMJ mobility were excluded from the study. After pre-anesthetic evaluation and investigations, the patients were explained about the procedure. Informed written consent was obtained. Standard pre-operative procedure was followed and base line vital parameters were recorded. Patients of group "S" received steam inhalation half an hour prior to surgery and group "C"did'nt receive steam. Patients were observed intra-operatively, in recovery room and ward for any complication like sore throat, cough, tracheitis, hoarseness, laryngeal oedema etc. and were treated accordingly upto 24 hrs.

OBSERVATION AND RESULTS

Table 1.

Parametres	Group S (n = 30)	Group C (n = 30)
Sore throat	3 (10%)	11 (36%)
Tracheitis	0 (0%)	2 (6%)
Hoarseness	2 (6%)	16 (53%)
Cough	2 (6%)	8 (26%)
Laryngeal oedema	0 (0%)	4 (13%)

- The incidence of sore throat was 36 % in group C as compared to 10 % in group S.
- The incidence of tracheitis was 6 % in group C as compared to none in group S.
- The incidence of hoarseness was 53 % in group C as compared to 6 % in group S.
- The incidence of cough was 8% in group C as compared to 6 % in group S.
- The incidence of laryngeal oedema was 13 % in group C as compared to none in group S.

In our study we found that incidence of sore throat(36%), tracheitis (6%), hoarseness(53%), cough(26%) & laryngeal oedema (13%) in control group was significantly more when compared to incidences seen in steam inhalation group.

DISCUSSION

General anesthesia with endotracheal intubation can result in various post-operative complications like sore throat, tracheitis, hoarseness, cough, laryngeal oedema, stridor etc. These symptoms may be considered minor by some but are important measures of quality of care. In most of the cases the symptoms resolves spontaneously but in few cases these may persist& when these occurs patients my perceive them as mild to severe and are often discomforting (Janesson, 2010). Hence identification and prevention of these symptoms would add to patient satisfaction. The incidence of sore throat in our study was 34% in patients not receiving steam which is slightly lower than those obtained in similar studies that reported an incidence of 32-63% by Christensen AM et al in 1994 and Kloub R et al in 2001 but higher than findings by McHardy and Chung et al in 1999 and 10% in patients who received steam prior to endotracheal intubation. In the study carried by Obiaya et al, sore throat was the third commonest post-operative complication. In the studies carried out by Obiaya et al and Chung et al, incidence of sore throat was highest in the younger age group and significantly higher in females than males. Tracheitis not very common complication after endotracheal intubation but if occurred can be detrimental to patients. Possible causes for the development of the condition were mostly related to subglottic epithelial trauma caused by the pressure of the cuff of the tube for a long time on the mucosa and the drying effect of volatile inhalational agents and or use of anti-cholinergic agents (Yasuo Harada, 1977). In another study during the post-anesthetic period, laryngeal edema and tracheitis with obstructive croup-like symptoms occured in a certain percentage of children who underwent intubation for surgery. In a small portion of these children, despite the usual therapy with cool mist occasionally combined with corticosteroids, progression of the obstruction requires more active means of restoring the airway. With positive pressure assistance to ventilation while nebulizing racemic epinephrine, we have been able to relieve the obstruction in all children with this complication without recourse to reintubation or tracheotomy (William, 1970). In our study the incidence of tracheitis was found to be 6 % in patient not receiving steam inhalation while non of the patient had complaint of tracheitis who received steam inhalation. We found that hoarseness occurred in 53% of patients with endotracheal intubation on the day of operation not receiving steam and persisted more upto a week in few and 6% incidence in patients who received steam prior to endotracheal intubation. Incidence of post-operative hoarseness in our population (53%) is similar to or greater than the incidences reported previously by Mencke T et al in 2003 and Maruyama k et al in 2004 (Mencke, 2003 and Maruyama, 2004). It was also observed that use of smaller diameter tubes may reduce hoarseness after general anesthesia (Stout, 1987). Also use of lidocaine gel to the cuff showed increase in the incidence of hoarseness (Jones, 1992). It may have contributed to higher incidence of hoarseness, but other studieshave not noted this effect of lignocaine gel (Maruyama, 2004; Mc Hardy, 1999 and Sumathi, 2008). Consistent with previous report (Jones, 1992), multiple linear regression analysis showed that duration of intuabation was a strong predictor to increase the duration

of hoarseness after endotracheal intubation. The longer the duration of anesthesia, greater is the airway injury. There are several potential limitations in our study. A larger sample size may have shown significance for this complication, also the diagnosis of hoarseness includes judgement of doctor visiting after operation and complaint of hoarseness by the patient. Cough though minor sequelae after general tracheal anaesthesia can be distressing to the patient. Earlier studies has reported an incidence of 6% to 40% (Sumathi, 2008). In our study the incidence of cough in post-extubation period was 26% in patients not receiving steam inhalation while incidence is 6% in patients receiving steam inhalation. Several studies also suggested that use of betamethasone gel during endotracheal intubation reduces the risk of coughing significantly when compared with the use of lidocaine gel during endotracheal intubation (Sumathi, 2008). Also it was found that use of betamethasone gel is beneficial for patients in post-operative period when it was compared with the patients receiving ketamine gargles prior to tracheal intubation (Huang, 1998). In another study it was observed that alkalized and warmed lidocaineprestored in the endotracheal tube (ETT) cuff can greatly reduce ETT-induced coughing and thus promote a smoother emergence from general anesthesia with endotracheal intubation (Huang, 1998). However, the in vivo effects of ETT-cuff lidocaine have not been studied. Laryngealoedema is a frequent complication of endotracheal intubation and is caused by trauma to larynx (Colice, 1989 and De Bast, 2002). It presents as stridor or respiratory distress or both following extubation and the patient may need for re-intubation in case the symptoms is severe. Earlier studies have reported an incidence of post extubation laryngeal oedema ranging from 5% - 54% (De Bast, 2002; Francois; 2007; Darmon, 1992 and Chung, 2006). In our study the incidence of laryngeal edema is 13% in patients not receiving steam inhalation while its nil (0%) in patients receiving steam inhalation prior to endotracheal intubation. Several studies suggested following risk factors including female gender, longer duration of intubation, use of large tube size, high cough pressure and difficult intubation. Numerous studies have investigated in the prevention of laryngeal edema with the use of corticosteroids intravenously and initial studies failed to show a beneficial effect of corticosteroids on post operative laryngeal edema (Darmon, 1992; Ho, 1996). However in more recent studies corticosteroids have shown decrease in the incidence of post operative laryngeal edema by 50% (Francois, 2007; Cheng, 2006; Lee, 2007). Perhaps future research should focus on the identification of patients at risk for post extubation laryngeal edema.

Conclusion

Hence from our study we conclude that steam inhalation prior to endotracheal intubation is beneficial to the patients in preventing various complications like sore throat, tracheitis, laryngeal oedema, cough & hoarseness etc.

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