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ORIGINAL ARTICLE

Effectiveness of Ketamine Gargles in Prevention of Post-Operative Sore Throat in Patients Undergoing Endotracheal Intubation

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ABSTRACT

Objective: To compare the efficacy of ketamine gargles versus placebo in prevention of post-operative sore throat in patients undergoing endotracheal intubation.

Study design: Randomized controlled trial.

Place and Duration of Study: Department of Anesthesiology and Critical Care, National Institute of Cardiovascular Diseases, Karachi from 13th April 2018 to 12th October 2018.

Methodology: Eighty six patients undergoing elective pelvic or abdominal surgery under general anaesthesia of age between 18–50 years of either gender were included. Patients with preoperative sore throat in addition to asthma who require more than single attempt for tracheal-tube passage were excluded from the study. Patients were allocated into two groups (Group K and Group P). All patients were premedicated with alprazolam 0.25 mg orally 3 hours before surgery. Patients in group K was given preservative free ketamine 1 ml (50 mg) in 29 ml of drinking water whereas group P was given 30 ml drinking water on entering the operation theater and was asked to gargle with the preparation for 40 seconds. At the end of 24 hours of surgery patients were asked to mark the severity of POST pain on the scale. A score of 0-3 was considered as effectiveness.

Results: The mean age of women in group K was 38.58±7.57 years and in group P was 38.21±7.33 years. Fifty nine (68.60%) were males and 27 (31.40%) were females. The efficacy (in terms of prevention of postoperative sore throat) was seen in 36 (83.72%) patients in group K (ketamine gargles) and in 22 (51.16%) patients in group P (placebo) with p-value of 0.001.

Conclusion: Ketamine gargle is very effective in prevention of post-operative sore throat in patients undergoing endotracheal intubation.

Keywords: Endotracheal intubation, Ketamine gargles, Post-operative sore throat

INTRODUCTION

Tracheal intubation (TI) is one of the most common protocol for management of the airways under various circumstances. It not only provides reliable ways for patient oxygen maintenance but also assists in highest degree protection against aspiration and regurgitation. TI is a sensitive procedure which required high level clinical expertise as rate of complications formation is very high even in situation where extra care in its performance has been taken.[1]

The major 4 characteristics are presented for straight forward oro-tracheal intubation. These are sufficient opening of mouth with full motion range of temporomandibular joint, adequate space in pharynx (which is known though back of mouth examination) and submandibular space. Submandibular space means the distance within thyroid-cartilage and chin, tongue displacement space. Another feature is satisfying extension of cervical-spine at the joint of atlantooccipital. Intubation becomes difficult in cases where anyone of the aforementioned characteristics is compromised.[2]

There are minor complication post TI including sore throat, lip lacerations, dislodged/fractured jaw and more serious complications as increased intracranial and interocular pressure, bronchospasm, pulmonary aspiration of gastric content as well as high blood pressure and many others.[3] Advanced technologies as flexible laryngoscopy through fiberoptic system has shown reduction in complication incidences.[4] Some complication can last life longer such as damage to vocal cord, retropharyngeal abscess or nerved damage or obstructions of the airway with a reported rate as 10-15%.[5]

Postoperative sore-throat (POST) is a known TI complication under GA with an incidence rate as 28-80%.[6-10] Despite POST being self-limited it causes severe patient discomfort. Ketamine being traditional intra-operative anesthesia agent with significant analgesic effects. It is used for reduction of post operative agony.[11,12] Nebulization with ketamine facilitated in weakening severity of POST with no significant side effects.[13] Ketamine efficacy is reported as 75-86.7% in various studies[14-16] while a few studies have also reported to significant decrease in POST in placebo as well as ketamine group.[17]

MATERIALS AND METHODS

A randomized control trial performed at Anesthesiology & Intensive Care Department of National Institute of Cardiovascular Diseases, Karachi within duration of 13th April 2018 to 12th October 2018 on 86 patients. The age of the patients was 18-50 years and was having pelvic/abdominal elective surgery under GA. The ASA status I and II were study inclusive. Exclusion criteria referred as those with airway obstruction, preoperative history of sore throat, asthma, drug sensitivity, using anti inflammatory drugs, multiple TI attempts causing bucking/coughing. Patient's age, gender, history of smoking, diabetes and hypertension were documented on well-structured questionnaire. Study patients were divided into two groups through sealed-opaque envelop method as group K and Group P. Patients were given alprazolam 0.25 mg orally 3 hours prior surgery. Group K was administered with 1ml ketamine in 50 mg diluted in 29ml drinking water. Group P was required to gargle with 30ml drinking water pre operative for 40 seconds. Non invasive standard monitoring was continuously done during anesthesia. Pre-oxygenation anesthesia induction was done with fentanyl 2mcg.kg−1 and 2 mg.kg−1. Eye lash reflux was obtained through propofol and atracurium in 0.5mg.kg−1 which facilitated facilitates orotracheal intubation by PVC endotracheal tube with low pressure cuffs. Internal 7.5mm diameter for females and 8.5mm diameter for males was applied. TI was done by experienced anesthesiologist. Lubrication of endotracheal tubes at room temperature was done by sterilized water. The cuffs were than filled with room air volume for avoiding audible risk of air leak. Thirty three percent oxygen in nitrous oxide and halothane supplementation was used in anesthesia. IV fentanyl provided small dosage of supplemented anesthesia. Residual-neuromuscular relaxation by atracurium was then antagonized by the use of neostigmine in addition to glycopyrrolate in post-surgery completion. Trauma was voided by oro pharyngeal suction prior to extubating. This confirmed completion of secretion-clearance.

Before surgery each patient was trained for using visual analogue scale. Post-surgery patients were requited for marking POST pain severity through scale. Effectiveness was considered through zero to three scale points in addition to duration of surgery, BMI and other variables as mentioned earlier. Data was analyzed by using SPSS version 20.0 through chi square tool with p value <0.05 as significant.

RESULTS

The mean age of group K was 38.58±7.57 years and group P was 38.21±7.33 years. Majority of the patients 59 (68.60%) were between 36 to 50 years of age. Thirty (69.77%) males and 13 (30.23%) females in group K while in group P, 29 (67.44%) males and 14 (32.56%) females.

Table 1: Demographic information of the patients (n=86)

Variable	Group K (n=43)		Group P (n=43)	
	No.	%	No.	%
Age (years)				
18-35	12	27.91	15	34.88
36-50	31	72.09	28	65.12
Gender				
Male	30	69.77	29	67.44
Female	13	30.23	14	32.56
Duration of surgery (minutes)				
≤60	15	34.88	16	37.21
>60	28	65.12	27	62.79
BMI (mg/m^2)				
≤27	16	37.21	18	41.86
>27	27	62.79	25	58.14
ASA				
I	24	55.81	23	53.49
II	19	44.19	20	46.51

Table 2 : Comparison of comorbidities within two groups

Variable	Group K (n=43)		Group P (n=43)	
	No.	%	No.	%
Hypertension				
Yes	13	26.47	14	32.56
No	30	73.53	29	67.44
Diabetes mellitus				
Yes	19	44.19	20	46.51
No	24	55.81	23	53.49

Table 3: Comparison of efficacy of ketamine gargles versus placebo in prevention of post-operative sore throat in patients undergoing endotracheal intubation

Efficacy	Group K (n=43)		Group P (n=43)	
	No.	%	No.	%
Yes	36	83.72	22	51.16
No	07	16.28	21	48.84

P = 0.001 (Significant)

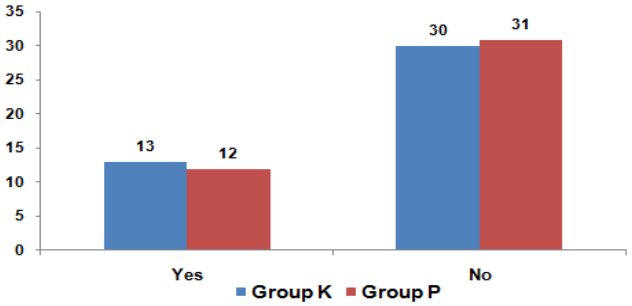

Fig. 1: Comparison of smoking history within groups

Mean duration of surgery was 62.81±12.75 minutes in group K and 61.58±12.20 in group P. The mean body mass index was 28.56 ± 3.45 kg/m^2 in group K and 28.56±3.70 kg/m^2 in group P. According to ASA scale, 24 (55.81%) have ASA I 19 (44.19%) ASA II in group K while in group P, 23 (53.49) have ASA 1 and 20 (46.51%) have ASA II (Table 1). Distribution of patients according to hypertension, diabetes mellitus was also shown in Table 2. Distribution of patients according to smoking history was also shown in Fig 1. The efficacy was seen in 36 (83.72%) patients in group K (ketamine gargles) and in 22(51.16%) patients in group P (placebo) with P=0.001 (Table 3).

DISCUSSION

Tracheal intubation results into sore throat in many cases with its severity linked with various factors as pressure and size of tracheal tube as well as anesthesiologist experience.[18-20] This complication is also associated with cough, laryngitis, dysphagia and horeseness.[21] Women were more frequently affected during gynecological surgeries and administration of succinylcholine.[22] Risk management can be done by better methodologies. Non pharmaceutical methods includes use of thinner tubing which is slippery with performing TI post muscle relaxation.[23] Pharmaceutical prophylactic approaches involved gargling with use of sodium azulene sulfonate, IV dexamethasone, oral-inhalation, beclomethasone or fluticasone-propionateinhaler.[24-26] Ketamine blocks many pain receptors such as N-methyl-D-aspartatem, 2-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid, kainite as well as POST. Former blocks peripheral nerve-synapses..[27,28]

In the present study the efficacy of ketamine was observed in 83.72% while it was observed as 86.7% in another study and as 75% in Indian research.[15] Another single blind study showed reduction in POST in ketamine group than other reported groups.[29] Recent studies have shown role of ketamine in lung protection against injury and inflammation though anti-inflammatory functions.[30,31] Further the studies elaborates that gargling, nasal or rectal usage with ketamine reduced the severity incidence of POST.[32-33] Saline use has much lower effects in reduction of POST than ketamine use as described in research.[34] Other studies such as from Nepal has shown effect of ketamine in decreasing POST in post operative cases wherein ketamine was used in one group while placebo was given in other and significant variance of efficiency was noticed among both groups.[17,35]

Shresta et al[36] described in their clinical trial on abdominal or orthopedic surgery patients a significant efficient effect of ketamine, the administered drinking water in one group while ketamine gargling in other and found ketamine gargles much useful than saline gargles against POST. However, Rajkumar et al[37] performed a double blind on abdominal surgery patients undergoing GA and found no variance among saline and gargle group in reduction of POST. The present study although provides evident proves on the efficiency of ketamine gargles in reduction of POST in Tracheal intubation patients.

CONCLUSION

Ketamine gargle is very effective in prevention of post-operative sore throat in patients undertaking endotracheal intubation. So, we recommend that ketamine gargles should be used in every patient undergoing endotracheal intubation for post-operative sore throat as well as morbidity of thepatients.

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