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A Study to Observe Effect of Ketamine Gargle in Post Operative Sore Throat and Hoarseness of Voice Following Endotracheal Intubation in Patients Undergoing Surgery Under General Anaesthesia

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Abstract

Background: Intubation results in injury to airway mucosa or vocal cords which may be the contributing factor in post operative sore throat, hoarseness of voice. Tracheal intubation is a foremost cause of trauma to the airway mucosa, resulting in postoperative sore throat (POST) with reported incidences of 22-64%. We compared the effectiveness of ketamine gargles with placebo in preventing POST after end tracheal intubation.

Methods: Fifty ASA I-II, patients undergoing elective surgery for general anesthesia were enrolled in this prospective, randomized, study. Patients were randomly allocated into two groups of 25 subjects each: Group K, ketamine 50 mg in saline 29 ml. Patients were asked to gargle this mixture for 30 s, 5 min before induction of anesthesia. POST and hoarseness of voice was graded at 0, 2, 4, and 24 h after operation on a four-point scale (0-3)

Results: POST occurred more frequently in Group C, when compared with Group K, at 0, 2, and 24 h and significantly more patients suffered severe POST in Group C at 4 and 24 h compared with Group K (P,0.05). hoarseness of voice occurred more frequently in Group C, when compared with Group K, at 0, 2, and 24 h

Conclusion: Ketamine gargle significantly reduced the incidence and severity of POST and hoarseness of voice.

Keywords: Analgesic techniques; Topical; Complications; Intubation tracheal; Sore throat; Pharmacology; Ketamine; Anesthesia; Azulene sulfonate; Vocal cords; Ketamine

Introduction

Patients who are given general anesthesia, majority of them undergo endotracheal intubation either for long duration or short duration. This results in injury to airway mucosa or vocal cords which may be the contributing factor in post operative sore throat, cough and hoarseness of voice. The reported incidence of post operative sore throat (POST) varies from 21% to 65% hoarseness of voice (HOV) and cough has also been reported with incidences varying between 4% to 42%. Numerous non-pharmacological trails like smaller sized endotracheal tube, lubricating endotracheal tube with water soluble jelly, minimizing intracuff pressure etc. have been used for attenuating POST, HOV and cough with variable success. The pharmacological measures include, beclomethasone inhalation and gargling with azulene sulfonate. NMDA receptors are found in the central nervous system as well as the peripheral nerves, which on activation results in nociceptive behaviours and contribute to inflammatory pain. Experimental studies showed that peripherally administered [1]. NMDA receptor antagonists are involved with antinociception and anti-inflammatory cascade [2]. Therefore, we suppose that ketamine being NMDA receptor antagonist is likely to act as an antinociceptive and anti-inflammatory agent in attenuating POST, HOV and cough after endotracheal intubation. Ketamine is routinely used, easily available and cost-effective drug. Gargle being an acceptable and simple method of administration of ketamine, we intend to observe the effect of ketamine gargle in POST, HOV and cough after endotracheal intubation.

Methods

The study was approved by the institutional ethics committee and performed at RKDF MEDICAL COLLEGE AND RESEARCH CENTRE Anesthesiology Department. A written informed consent was received from 50 ASA I-II, elective patients undergoing surgery for general anaesthesia. The study was conducted in a prospective, randomized. Inclusion Criteria: [1] Patients willing to sign the written informed consent [2]. Patients of either gender aged between 18 to 55 years [3]. Patients undergoing elective surgical procedures of not lasting more than1hr and 30min duration under general anaesthesia [4]. Patients belonging to ASA l and ll. Exclusion Criteria: [1]. Patients with history of prior sore throat, patients with known upper respiratory tract infection or lower respiratory tract infection [2]. Patients with known allergy, sensitivity or any other form of reaction to study drug [3]. Patients with poor cardiovascular and respiratory reserve [4]. Patients with ASA lll or more [5] Patients with anticipated difficult airway. Written informed consent obtained from all the patients who fulfilled the inclusion criteria and were willing to participate in the study. Patients were randomized into the two groups with the help of a computer-generated table of random numbers. Group C received saline 30ml and Group K received ketamine 50mg in saline 29ml. The preparations of 30ml each were placed in an opaque container by a staff nurse who also asked patients to gargle with the preparation for 30s after their arrival in the operation room. This nurse did not participate in the subsequent management of these patients. Anaesthesia was induced 5 min later. The patients could not be blinded because of the different tastes of the two preparations. Monitoring consisted of ECG, non-invasive arterial pressure, pulse oximetry, and end-tidal carbon dioxide. Anaesthesia was induced with Pentazocine 6mg /kg and propofol 2 mg/kg. the trachea was intubated with a soft seal cuffed sterile polyvinyl chloride endotracheal tube with a standard cuff and an internal diameter of 7-8 mm for women and 8-9 mm for men. Tracheal intubation was performed by an experienced anaesthesiologist after ensuring maximum neuromuscular blocking effect as assessed by TOF guard. All the patients received i.v. acetaminophen 500 mg 30min after tracheal intubation. Anaesthesia was maintained with oxygen 33% in air, supplemented with Desflurane. The tracheal tube cuff was inflated until no air leakage could be heard with a peak airway pressure at 20cm H_2O, and cuff pressure was maintained between 18 and 22cm H_2O using handheld pressure gauge Those patients who required more than one attempt for passage of the tube were excluded from the study [3]. Gauze packs were used to occlude the posterior nasopharynx, thus isolating the nasal passage in order to allow suctioning of blood and debris from the operative field and prevent soiling of the pharynx, oesophagus, and trachea. The nose was packed at the end of operation by a small nasal packing. Residual Desflurane relaxation was reversed with neostigmine and atropine on completion of surgery [4]. Oropharyngeal suction was performed under direct vision to avoid trauma to the tissues before extubation and to confirm that the clearance of secretions was complete. The patients were interviewed in a standard fashion by a blinded investigator. On arrival in the post-anaesthesia care unit (0 h), and at 2, 4, and 24 h thereafter, POST was graded on a four-point scale (0-3): 0, no sore throat; 1, mild sore throat (complains of sore throat only on asking); 2, moderate sore throat (complains of sore throat on his/her own); and 3, severe sore throat (change of voice or hoarseness, associated with throat pain).. HOV was graded as: (0-3): no hoarseness 1: mild (no hoarseness at the time of interview but had it previously)2: moderate (only is felt by patient at the time of interview)3: severe (recognizable at the time of the interview)

Results

Age, height, weight, smoking habit, duration of surgery and intubation, and total Pentazocine consumption were similar among the groups (Table 1) (P.0.05). Two patients in the ketamine group could not gargle properly and one patient in the same group required two attempts for the intubation; these patients were excluded. It was observed that from 4 hours onwards there was no statistically significant difference in terms of POST grading in both K and C groups. However, in the beginning and at 2 hours, there was significant differences in observation of the POST gradings. Hence ketamine gargles were proved to be effective to attenuate post operative sore throat in initial 4hrs postoperatively. There was significant difference observed in the severity of hoarseness of voice till 24 hours, which implied that ideal time duration to alleviate voice quality issues with the drug is 24 hours. Hence, from the results it can be observed that ketamine gargles were effective in reducing the incidence of hoarseness of voice for initial 24 hours postoperative period.

Discussion

We found that the incidence and severity of POST were reduced after preoperative gargling with ketamine compared with saline gargling in patients undergoing operation, The cause of sore throat related to pharyngeal pack might be a consequence of localized trauma, leading to aseptic inflammation of pharyngeal mucosa. It may also be associated with oedema, congestion, and pain [5]. Kempe and colleagues [6] reported that patients who underwent surgery of nasal septum suffered from dryness and inflammation of the oral cavity due to mouth breathing. We presume that late onset of severe pain in the control group reflects a more gradually developing local inflammation. Reduction of this inflammation by ketamine gargling may be the reason for decrease in POST in our study. In recent years, studies have shown that ketamine plays a protective role against lung injury, by means of its anti-inflammatory properties [7,8]. Additionally, ketamine has been shown to attenuate symptoms of endotoxaemia in a lipopolysaccharide (LPS)-induced rat model of sepsis, by reducing NFkappa B activity and TNF-alpha production [9] and diminishing the expression of inducible nitric oxide synthase [10] in a recent

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animal study for asthma, Zhu and colleagues have indicated that nebulized ketamine attenuated many of the central components of inflammatory changes. In another study, Zhu and colleagues [11] have proposed a protective effect of ketamine on allergen-induced airway inflammatory injury and high airway reactivity in asthma in an experimental model with rats. With respect to this potential protective effect, we propose that ketamine gargle might be effective in reducing the incidence and severity of POST due to its anti- inflammatory effects. Studies into the nasal, oral, and rectal administration of ketamine also suggest that local use of this drug is both effective and conceivable. In Conclusion. Ketamine gargles significantly reduces incidence and severity of post operative sore throat, hoarseness of voice and cough in the patients following endotracheal intubation in the patients undergoing surgeries under general anaesthesia.

Table 1

CLINICAL OUTCOME ANALYSIS -POST

Time frame	Grading(0-2)	Group k (n=25)	Group c (n=25)	
AT 1 HOURS	0	25	14	<0.05
	1	0	8	
	2	0	3	
AT 2 HOURS	0	25	14	<0.05
	1	0	8	
	2	0	3	
AT 4 HOURS	0	20	15	0.132
	1	5	7	
	2	0	3	
AT 24 HOURS	0	13	15	0.362
	1	11	7	
	2	1	3	

Table 2

CLINICAL OUTCOME ANALYSIS- HOV

Timeframe	Grading (0-2)	Group k (n=25)	Group c (n=25)	
At 1 hour	0	25	11	<0.05
	1	0	10	
	2	0	4	
At 2 hours	0	24	11	<0.05
	1	1	10	
	2	0	4	
At 4 hours	0	20	12	0.035
	1	5	10	
	2	0	3	
At 24 hours	0	13	12	0.585
	1	11	10	
	2	1	3	

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