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ORIGINAL RESEARCH

Medicine Science International Medical Journal

Medicine Science 2018;7(4):802-4

Benzydamine gargle versus ketamine gargle for postoperative sore throat

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Received 12 April 2018; Accepted 23 April 2018
Available online 25.07.2018 with doi: 10.5455/medscience.2018.07.8856

Abstract

Postoperative sore throat is usually accepted as a minor complication, however it contributes to patient dissatisfaction. The primary aim of this study is to compare the effects of two different therapies for postoperative sore throat. The secondary aim is to determine the correlation of smoking and postoperative sore throat via visual analogue scale scores. The patients diagnosed as "postoperative sore throat" were detected from hospital database. The files of the patients with severe sore throat after tracheal intubation for laparoscopic cholecystectomy, were analyzed retrospectively. The patients treated with either benzydamine or ketamine gargle were included into the study. Age, sex and smoking habits, visual analogue scale scores at the 1st, 24th and 48th hour and the chosen therapy were recorded according to nurse care records.122 patients were included into the study. There were no significant differences for age, sex, smoking habits and visual analogue scale scores in the postoperative first hour among the therapy groups. Mean visual analogue scale was 2.8±0.83 in ketamine group and 3.3±0.99 in benzydamine group at the postoperative 24th hour ($p < 0.05$). At postoperative 48th hour, it was 1.06±0.756 in ketamine group and 1.5±0.718 in the benzydamine group ($p < 0.05$), At all time points, mean visual analogue scale were similar among smoking and non-smoking patients ($p > 0.05$). In this study, the ketamine gargle was more effective than the benzydamine gargle for attenuation of postoperative sore throat. Moreover, no significant effects of smoking were detected with regard to the POST incidence.

Keywords: Benzydamine, ketamine, postoperative, sore throat

Introduction

Most of the time postoperative sore throat (POST) is accepted as a minor complication, however it can contribute to postoperative morbidity and patient dissatisfaction [1]. It occurs due to pharyngeal, laryngeal, or tracheal irritation. Although the reported incidence of POST is as high as 40%-100% in intubated patients, it can be seen even in the absence of endotracheal intubation [2].

The primary aim of this study was to retrospectively compare the effects of two different POST therapies. The secondary aim was to determine the correlation between smoking and POST using visual analogue scale (VAS) scores.

Material and Methods

After obtaining institutional review board approval, the patients diagnosed with "postoperative sore throat" between January 2012 and January 2016 were extracted from the hospital database. The files of the patients with severe sore throat (VAS > 5) after tracheal intubation for laparoscopic cholecystectomy, were analyzed retrospectively. From this group, those patients treated with either benzydamine hydrochloride gargle or ketamine gargle were included into the study. The exclusion criteria's were age olderhan 65 years, difficult intubation story, operation time longer than two hours, and story of another therapy for POST. Each patient's age, sex, smoking habits, VAS scores at the 1st, 24th and 48th hours and the chosen therapy were recorded according to the nurses' care records. The patients had been treated by two different anesthesiologists who worked in the general surgery operating rooms at different time periods. In the benzydamine group, the patients were treated with 15 mL benzydamine hydrochloride 0.15% twice a day starting with the first hour postoperatively until the end of second day. In the ketamine group 20 ml of 0.5 mg/kg ketamine was administered to the patients in the same manner until the end of the second day. The patients who were treated for longer than 48 hours, were excluded from the study.

The statistical evaluation was performed using the Statistical Package for the Social Science, version 18.0 (SPSS Inc., Chicago, IL, USA). The descriptive data of the study was specified with mean, standard deviation, and percentage. The normality of the variables was analyzed by Kolmogorov-Smirnov test. The Student's t test and Mann Whitney U test were used to evaluate the associations between categorical and continuous variables. A one-way analysis of variance test was used to evaluate the VAS scores among the smoking and non-smoking patients at different time points. The values were considered to be statistically significant at $p < 0.05$.

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Results

In total, 153 patients with POST diagnoses after laparoscopic cholecystectomy were extracted from the database. Twelve of the patients were excluded because they were older than 65 years, and six of the patients were excluded due to difficult intubation. In five of the cases, the operation time was longer than two hours and in eight of the cases, additional analgesic drugs were administered to the patients. Consequently 122 patients were included into the study.

There were no significant differences with regard to the age, sex, smoking habits and VAS scores in the postoperative first hour among the therapy groups (Table1).

Table1. Patient characteristics

	Benzydamine gargle	Ketamine gargle
Age	44.27 ±10.34	44.31 ± 10.74
Sex (m/f)	30/32	27/33
Smoking habit (+/-)	32/30	28/32
VAS1	7.5 ±0.82	7.5 ± 0.81

VAS1: VAS score within the first hour postoperatively before treatment

At the postoperative 24th hour, the mean VAS scores were 2.8±0.83 in the ketamine group and 3.3±0.99 in the benzydamine group. This difference was statistically significant ($p < 0.05$) (Table 2).

Table 2. VAS scores at the postoperative 24th hour

	Therapy	n	mean	Std. deviation	sig
VAS24	Benzydamine	62	3.3065	78068	p = 0.01
	Ketamine	60	2.8167	83345	

VAS24: VAS score at the postoperative 24th hour

When the VAS scores at postoperative 48th hour were compared between the therapies, mean VAS score was 1.06±0.756 in ketamine group and it was 1.5±0.718 in the benzydamine group. The difference was statistically significant, too ($p < 0.05$) (Table 3).

Table 3. VAS scores at the postoperative 48th hour

	Therapy	n	mean	Std. deviation	sig
VAS24	Benzydamine	62	1.5000	71861	p=0.02
	Ketamine gargle	60	1.0667	75614	

VAS24: VAS score at the postoperative 24th hour

When the effects of smoking habit on the VAS scores were analyzed at the different time points, no significant differences were detected among the groups (Table 4). At all the time points, the mean VAS scores were similar among the smoking and non-smoking patients.

Table 4. VAS scores of smoking and non-smoking patients

Smoking habit		VAS1	VAS24	VAS48
Yes	**mean**	7.1	3.03	1.38
	n	60	60	60
	Std. deviation	87	82	78
No	**mean**	7.46	3.09	1.19
	n	62	62	62
	Std. deviation	74	86	74
P		p = 0.739	p =0.679	p =0.172

Discussion

In the current study, the ketamine gargle was found to be significantly more effective than the benzydamine hydrochloride gargle for attenuating POST at the postoperative 24th and 48th hours. Although smoking is well known to induce apoptosis in the respiratory epithelium, no significant differences in the VAS scores were detected among the smoking and non-smoking patients at any of the time points.

POST is a widespread complication of anesthesia leading to discomfort in many patients [3]. It can cause postoperative difficulties in swallowing and respiration postoperatively. Moreover, it may extend the recovery period by negatively influencing the nutrition and fluid intake of the patients [4].

There are several pharmacological and nonpharmacological strategies to reduce POST. For example, smaller sized endotracheal tubes, the endotracheal tube lubrication with a water-soluble gel, gentle oropharyngeal suctioning, careful airway instrumentation, full relaxation before intubation, reduction of endotracheal tube cuff pressure and fully deflation of cuff before extubating have all been recommended as nonpharmacological methods [5].

In addition, steroids, non-steroidal anti-inflammatory drugs (NSAIDs), ketamine gargle and recently magnesium have been reported as pharmacological methods for the attenuation of POST [6].

Benzydamine hydrochloride is the most common NSAID used for the therapy of POST. It is a topical preparation with antibacterial properties that can be sprayed directly onto the tracheal tube and into the oropharynx [7,8]. It has also been reported to be useful when applied as a gargle. In the study of Agarwal et al, benzydamine hydrochloride gargle was reported to reduce the POST severity for 24 hours when compared to mineral water [1].

In recent years ketamine has been shown to have a protective role in lung injury based on its anti-inflammatory properties [9]. In an experimental model, anti-inflammatory effect of ketamine was also studied in airways [10]. Additionally, Canbay et al. used ketamine as a prophylactic therapy to reduce POST. They reported a significant reduction when a ketamine gargle 0.5 mg/kg was used for 30 seconds 5 minutes before the surgery. [11]. In the current study, mean VAS score of all patients was 1.09±0.894 at the postoperative 48th hour. Although both therapies can be considered to be successful, the ketamine gargle was more effective for the POST attenuation then the benzydamine gargle. Nowadays N-methyl-D-aspartate (NMDA) receptors are thought to be present in both the central nervous system and peripheral nerves. An experimental study reported that NMDA antagonists to provide anti-nociception in the peripheral nerves [12]. According to these studies ketamine, as an NMDA receptor antagonist, is believed to play a local role in reduction of POST [11].

Smoking has been reported to cause structural and functional changes in the respiratory epithelium. In the study by Luppi et al, smoking caused a reduction in the vital functions of the cells and induced apoptosis in the respiratory epithelium [13]. In a recent study, smoking was shown to increase several laryngopharyngeal and oral cavity symptoms when compared with non-smokers

[14]. So, higher VAS scores due to POST were expected from the smokers, however there was no significant difference. This result is similar to that of previous studies. Canbay et al. did not find any correlation between smoking habit and sore throat, either [11]. The duration of the smoking habit can be the reason for these results. Neither in the current study, nor in the study by Canbay et al., the duration of smoking habit has not been mentioned.

Retrospective design is the main limitation of this study. Although the sample size was powerful enough to determine a significant difference, all the data was obtained from the patient files. Therefore, the validity of the results was completely dependent on the validity of the nurses' care records. The second limitation was the lack of the detailed smoking habit of the patients. In most of the files, there was no data about the smoking duration.

Conclusion

In this study, the ketamine gargle was more effective than the benzydamine gargle for attenuation of postoperative sore throat. Moreover, no significant effects of smoking were detected with regard to the POST incidence.

Competing interests
The authors declare that they have no competing interest

Financial Disclosure
The financial support for this study was provided by the investigators themselves.

Ethical approval
Before the study, permissions were obtained from local ethical committee.

References

1. Agarwal A, Nath SS, Goswami D, et al. An evaluation of the efficacy of aspirin and benzydamine hydrochloride gargle for attenuating postoperative sore throat: a prospective randomized, single-blind study. Anesth Analg. 2006;103:10001-3.
2. Biro P, Seifert B, Pasch T. Complaints of sore throat after tracheal intubation: a prospective evaluation. Eur J Anaesthesiol. 2005;22:307-11.
3. Hae Gyun Park, Jung Sik Im, Jeoung Sun Park. et al. A comparative evaluation of humidifier with heated wire breathing circuit under general anesthesia. Korean journal of anesthesiology. 2009;57:32-7.
4. Zuccherelli L. Postoperative upper airway problems. South Afr J Anaesth Analg. 2003;9:12-6.
5. Al-Qahtani AS MF. Quality improvement in anesthetic practice--incidence of sore throat after using small tracheal tube. Middle East J Anesthesiol. 2005;18:179-83.
6. El-Boghdadly K, Bailey CR, Wiles MD. Postoperative sore throat: a systematic review. Anaesthesia. 2016;71:706-17.
7. Hung NK, Wu CT, Chan SM, et al. Effect on postoperative sore throat of spraying the endotracheal tube cuff with benzydamine hydrochloride, 10% lidocaine, and 2% lidocaine. Anesth Analg. 2010;111:882-6.
8. Huang YS, Hung NK, Lee MS, et al. The effectiveness of benzydamine hydrochloride spraying on the endotracheal tube cuff or oral mucosa for postoperative sore throat. Anesth Analg. 2010;111:887-91.
9. Neder Meyer T, Lazaro Da Slva A. Ketamine reduces mortality of severely burnt rats, when compared to midazolam plus fentanyl. Burns. 2004;30:425-30.
10. Zhu MM, Qian YN, Zhu W, et al. Protective effects of ketamine on allergen-induced airway inflammatory injure and high airway reactivity in asthma: experiment with rats. Zhonghua Yi Xue Za Zhi. 2007;87:1308-13.
11. Canbay O, Celebi N, Sahin A, et al. Ketamine gargle for attenuating postoperative sore throat. British journal of anaesthesia. 2008;100:490-3.
12. Oatway M, Reid A, Sawynok J. Peripheral antihyperalgesic and analgesic actions of ketamine and amitriptyline in a model of mild thermal injury in the rat Anesthesia and analgesia. 2003;97:168-73.
13. Luppi F, Aarbiou J, van Wetering S, et al. Effects of cigarette smoke condensate on proliferation and wound closure of bronchial epithelial cells in vitro: role of glutathione. Respir Res. 2005;6:140.
14. Şanlı A, Bekmez E, Yıldız G, et al. Relationship between smoking and otorhinolaryngological symptoms. Kulak Burun Bogaz Ihtis Derg. 2016;26:28-33.