MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.11.253.257

OPEN ACCESS

Key Words
Correlates, dexamethasone, ketamine, sore throat, surgery

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Received: 20 August 2024
Accepted: 20 October 2024
Published: 23 October 2024

Citation: Shilpa Nijalingappa Bingi, M. Sunitha and Khajabanu Y. Hugar, 2024. Correlates of Dexamethasone Versus Ketamine Soaked Pharyngeal Pack for Prevention of Sore Throat Following Oro-Nasal Surgeries. Res. J. Med. Sci., 18: 253-257, doi: 10.36478/makrjms.2024.11.253.257

Correlates of Dexamethasone Versus Ketamine Soaked Pharyngeal Pack for Prevention of Sore Throat Following Oro-Nasal Surgeries

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ABSTRACT
The method used for airway management has the strongest influence on the incidence of sore throat. Female sex, younger patients, surgery for gynecological procedures and succinylcholine also predict postoperative sore throat. The association between postoperative stay and sore throat could result from the discomfort of a sore throat early in the postoperative period making patients reluctant to go home. Pre-anesthetic assessment was done one day prior to the surgery. A detail history of present and past medical illness, past h/o of anaesthetic exposure, concomitant history of drug allergy and intake of any medications in preoperative period was recorded. Mean CUFF Pressure in Group Ketamine was 20.06±0.97, in Dexamethasone was 20.03±0.98and in Normal Saline was 19.97±1.04. There was no significant difference in mean CUFF Pressure comparison between three groups.

INTRODUCTION

Sore throat is a common postoperative complaint. After tracheal intubation, the incidence of sore throat varies from 14.4-50% and after laryngeal mask insertion from 5.8-34%. The wide variation in these figures is presumably due to different skills and techniques among anaesthetists and to differences between individual anaesthetists and patients in the definition of sore throat[1]. The high variability of incidence is due to a large number of factors implicated in POST. It was rated by patients as the 8th most undesirable outcome in the postoperative period. Although the symptoms resolve spontaneously without any treatment, prophylactic management for decreasing its frequency, and severity is desirable[2]. The method used for airway management has the strongest influence on the incidence of sore throat. Female sex, younger patients, surgery for gynaecological procedures and succinylcholine also predict postoperative sore throat. The association between postoperative stay and sore throat could result from the discomfort of a sore throat early in the postoperative period making patients reluctant to go home[3]. During nasal surgery, non aspirated blood may flow through nasopharynx and oropharynx and may drain into the stomach or leak past the tracheal tube cuff into the airway[3]. This drainage is facilitated by the reverse Trendelenberg position. Cuffed tracheal tubes do not provide 100% protection from aspiration[4]. As blood is a potent emetic, any significant postoperative nausea and vomiting (PONV) in the immediate postoperative period may result in aspiration of gastric contents[4]. It is commonly believed that pharyngeal packing will both absorb most of the blood loss and provide a physical barrier to the leakage of blood into the aero digestive passages. However, it has been shown that pharyngeal packing does not offer 100% protection. In addition, the trauma of placing a pharyngeal pack is associated with postoperative sore throat, injury to the pharyngeal plexus 34 and swelling of the tongue[5]. Numerous non-pharmacological and pharmacological trials have been used for attenuating POST with variable success. Smaller sized endotracheal tubes, lubricating the endotracheal tube with water-soluble jelly, careful airway instrumentation, intubation after full relaxation, gentle Oropharyngeal suctioning, minimizing intra- cuff pressure, 1 and extubation when the tracheal tube cuff is fully deflated are some non-pharmacological measures that have been reported to decreased the incidence of POST[6]. Pharmacological interventions includes studies evaluating medication in an effort to reduce the incidence of POST. Most of the studies involve use of steroid and non-asteroidal anti-inflammatory drugs, aimed at reducing irritation and inflammation believed to be causative factor in development of POST.

MATERIALS AND METHODS

Inclusion Criteria:

- Patients who are willing to give written/informed consent.
- Patients aged 18-75 years of both genders.
- Patients scheduled for elective oro-nasal surgeries under general anaesthesia.
- Patients under Physical status ASA-1 and ASA-2.

Exclusion Criteria:

- Patients refusing to take part in study.
- Patients under physical status ASA-3 and ASA-4.
- Pregnant women.
- Patients with known allergy to study drugs.
- Patients with history of pre-op sore throat, chronic obstructive pulmonary disease, upper respiratory tract infection.
- Patients with anticipated difficult airway.
- Patients with history of head injury.

After obtaining written informed consent, participation consent and approval from institutional ethical committee, patients were be randomly allocated to one of the three groups using numbers generated from www.random.org. Preanesthetic assessment was done one day prior to the surgery. A detail history of present and past medical illness, past h/o of anaesthetic exposure, concomitant history of drug allergy and intake of any medications in preoperative period was recorded. General physical examination and systemic examination of the patients was done. Routine investigation and relevant specific investigations were done. Height in cms and weight in kgs were recorded. Patients were advised overnight fasting and were premeditated with Tab. Pantoproazole 40 mg and Tab. Ondansetron 8mgs on the previous day of surgery and on the morning of surgery with few sips of water.A proforma was used to collect the data which includes patient's demographic parameters, indication for surgery, the anaesthetic details, intra operative and post- operative monitoring.

Drug and Dilutions: Patients were randomly allocated into three groups.

- **Group K:** Throat pack soaked in Ketamine 1mg/kg diluted in 15ml normal saline.
- **Group D:** Throat pack soaked in dexamethasone 8mg diluted in 15ml normal saline.
- **Group N:** Throat pack soaked in 15ml Normal saline.

RESULTS AND DISCUSSIONS

In Ketamine Group, 80.00% had ASA 1 and 20.00% had ASA 2, In Dexamethasone 80.00% had ASA 1 and 20.00% had ASA 2 and in Normal Saline group 82.86% had ASA 1 and 17.14% had ASA 2. There was no

Table 1: ASA Distribution Between Three Groups

		Group					
		Ketamine		Dexamethasone		Normal Saline	
		Count	%	Count	%	Count	%
ASA	1	28	80.00%	28	80.00%	29	82.86%
	2	7	20.00%	7	20.00%	6	17.14%

χ2= 0.124, df=2, p=0.94

Table 2: Attempts at Intubation Distribution Between Three Groups

		Group					
		Ketamine		Dexamethasone		Normal Saline	
		Count	%	Count	%	Count	%
Attempts at Intubation	1	25	71.43%	30	85.71%	25	71.43%
	2	10	28.57%	5	14.29%	10	28.57%

χ2 = 3.889, df=2, p=0.143

Table 3: Mean Duration of Surgery Comparison Between Three Groups

	Group						
	Ketamine		Dexamethasone		Normal Saline		
	Mean	SD	Mean	SD	Mean	SD	P value
Duration of Surgery (Hr: Min)	204.29	39.71	196.43	54.20	199.43	42.18	0.770

Table 4: Mean Weight Comparison Between Three Groups

	Group						
	Ketamine		Dexamethasone		Normal Saline		
	Mean	SD	Mean	SD	Mean	SD	P value
Weight	69.29	7.68	71.54	9.58	68.40	9.11	0.312

Table 5: Mean Height Comparison Between Three Groups

	Group						
	Ketamine		Dexamethasone		Normal Saline		
	Mean	SD	Mean	SD	Mean	SD	P value
Height	167.23	3.49	167.23	5.56	165.91	6.98	0.520

Table 6: Mean BMI Comparison Between Three Groups

	Group						
	Ketamine		Dexamethasone		Normal Saline		
	Mean	SD	Mean	SD	Mean	SD	P value
BMI	24.78	2.61	25.52	2.80	24.88	3.29	0.509

Table 7: Size of ET Tube Distribution between three groups

		Group							
		Ketamine		Dexamethasone		Normal Saline		Total	
		Count	%	Count	%	Count	%	Count	%
Size of ET Tube	7.0	3	8.6%	5	14.3%	5	14.3%	13	12.4%
	7.5	10	28.6%	10	28.6%	9	25.7%	29	27.6%
	8.0	16	45.7%	13	37.1%	15	42.9%	44	41.9%
	8.5	6	17.1%	7	20.0%	6	17.1%	19	18.1%
	Total	35	100.0%	35	100.0%	35	100.0%	105	100.0%

χ2 = 1.108, df = 6, p=0.981

Table 8: Mean CUFF Pressure Comparison Between Three Groups

	Group						
	Ketamine		Dexamethasone		Normal Saline		
	Mean	SD	Mean	SD	Mean	SD	P value
CUFF Pressure	20.06	.97	20.03	.98	19.97	1.04	0.935

Table 9: Mean Time at First Analgesia Comparison Between Three Groups

	Group						
	Ketamine		Dexamethasone		Normal Saline		
	Mean	SD	Mean	SD	Mean	SD	P value
Time at First Analgesia	17.00	7.97	15.82	8.17	7.74	4.00	0.001*

significant difference in ASA distribution between three groups (Table 1). There was no significant difference in Attempts at Intubation distribution between three groups (Table 2). Mean Duration of surgery in Group Ketamine was 204.29±39.71mins, in Dexamethasone was 196.43±54.20mins and in Normal Saline was 199.43±42.18mins. There was no significant difference in mean Duration of surgery comparison between three groups (Table 3). Mean Weight in Group Ketamine was 6.29±7.68kgs, in Dexamethasone was 71.54±9.58kgs and in Normal Saline was 68.4±9.11kgs. There was no significant difference in mean weight comparison between three groups (Table 4). Mean height in Group Ketamine was 167.23±3.49cms, in Dexamethasone was 167.23±5.56cms and in Normal Saline was 165.91±6.98cms. There was no significant difference in mean height comparison between three groups (Table 5). Mean BMI in Group Ketamine was 24.78±2.61, in Dexamethasone was 25.52±2.8 and in Normal Saline was 24.88±3.29. There was no significant difference in mean BMI comparison between three groups (Table 6). There was no significant difference in Size of ET Tube Distribution between three groups (Table 7). Mean CUFF Pressure in Group Ketamine was 20.06±0.97, in Dexamethasone was 20.03±0.98and in Normal Saline was 19.97±1.04. There was no significant difference in mean CUFF Pressure comparison between three groups (Table 8). Mean Time at First Analgesia in Group Ketamine was 17.00±7.97, in Dexamethasone was 15.82±8.17 and in Normal Saline was 7.74±4.00 there was a significant difference in mean Time at First Analgesia comparison between three groups (Table 9). Post-operative sore throat is the most common complaint in the post-operative period and is rated 8th most undesirable outcome[2]. Sore throat, cough and hoarseness is attributed to factors like tube size and design, cuff size and shape, intracuff pressure, attempts at intubation, duration of surgery and surgical manipulation N-methyl-d-aspartate (NMDA) receptors are located peripherally on sensory afferent nerve endings and contribute to pain if activated. Ketamine is an NMDA receptor antagonist possessing anti-inflammatory effects. Topical application of ketamine has been shown to be effective for chronic pain such as neuropathic pain and oral/throat indications such as mucositis or post tonsillectomy[7]. Dexamethasone is a corticosteroid that has 26.6 and 6.6 times stronger anti-inflammatory and immunosuppressant effects than cortisol and prednisone, respectively. Owing to its anti-inflammatory effects, dexamethasone is also used for autoimmune conditions such as rheumatoid arthritis and bronchospasm, for the control of side effects after chemotherapy in cancer patients and as a gargle solution in dentistry to alleviate the symptoms of oral lichen planus[8]. Corticosteroids are known for their anti-inflammatory actions. Their mechanism of action is thought to be by inducing lipocortins which are phospholipase A2 inhibitory proteins. These proteins are thought to be responsible in inhibiting the release of arachidonic acid, the common precursor of potent mediators of inflammation, such as prostaglandin and leukotrienes. By reducing or inhibiting the inflammatory response, it should be possible to reduce the incidence of post-operative cough, restlessness, hoarseness and sore throat. In our study, both dexamethasone and ketamine soaked pharyngeal pack were efficacious in preventing post-operative sore throat following oro-nasal surgeries with comparable hemodynamic and no side effects. The study was conducted over 105 patients undergoing elective oro-nasal surgery under general anaesthesia in hospitals attached to Bangalore Medical College and Research Institute from Nov 2018 to May 2020.They were divided into three groups of 35 each. In our study, distribution of age ranged from 18-60 years Mean Age in Group Ketamine was 32.97±9.12 years, in Dexamethasone was 34.80±9.48 years and in Normal Saline was 37.37±10.71 years. There was no significant difference in mean age comparison between three groups[9]. Myles reported that women were almost 1.5 times more likely to develop sore throat in post-operative period. Women are almost twice more likely to suffer from sore throat than men after endotracheal intubation and as many as 48-68% of women suffer from these symptoms. In Ketamine Group, 62.86% were male and 37.14% were Female, In Dexamethasone 57.14% were male and 42.86% were Female and in Normal Saline group 60.00% were male and 40.00% were Female. There was no significant difference in Sex distribution between three groups[10].

CONCLUSION

Mean CUFF Pressure In Group Ketamine was 20.06±0.97, in Dexamethasone was 20.03±0.98 and in Normal Saline was 19.97±1.04. There was no significant difference in mean CUFF Pressure comparison between three groups.

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