PROPHYLAXIS OF POSTINTUBATION SORE THROAT BY THE USE OF SINGLE PUFF INHALATION OF BECLOMETHASONE DIPROPIONATE PREOPERATIVELY

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ABSTRACT

Objective: The objective of the study was to assess the occurrence and severity of sore throat following endotracheal anaesthesia and its reduction by beclomethasone inhalation.

Study Design: A randomized controlled trial.

Place and Duration of Study: This study was carried out at the main operation theatre, Combined Military Hospital Rawalpindi from October 2002 to April 2003.

Patients and Methods: Two hundred patients undergoing general anaesthesia for elective surgery were included. Patients were randomly assigned to two groups of 100 patients each. The patients in group A were given one puff inhalation of beclomethasone before intubation while group B was control group. The patients were evaluated for occurrence and severity of postoperative sore throat by direct questions 6, 12, 24 and 48 hours after surgery.

Results: In the beclomethasone group, 10 patients had sore throat as compared to 55 in control group (p <0.01). All 10 patients who experienced symptoms in beclomethasone group had mild sore throat while among the patients in the control group 22 had mild, 13 had moderate and 20 had severe sore throat. After 48 hours, no patient had the symptoms in the study group while 9 of the control group still suffered from sore throat. No drug related side effects were observed.

Conclusion: Postoperative sore throat after general anaesthesia is common (occurrence rate of 55%). Beclomethasone inhaler is highly effective in the prevention of postoperative sore throat. It reduces both the occurrence and severity of sore throat.

Keywords: Beclomethasone, Intubation, Prophylaxis, Sore throat.

INTRODUCTION

Sore throat is a common postoperative complication and tracheal intubation is a major source of trauma to the airway mucosa, resulting in postoperative sore throat with reported incidence of 21–65%[1-4]. This complication has mainly been attributed to large tracheal tube size[5,6], use of suxamethonium[7], type of tube cuff and the tube cuff / trachea interface[4,6,8], increased intracuff pressures[8,9], suctioning[10], use of glycopyrrolate premedication[11], and the duration of anaesthesia[2]. Anaesthesiologists have long endeavored to reduce it, but their efforts have largely been unfruitful. Some of these measures included avoidance of glycopyrrolate premedication[11], use of mask only in anaesthesia[3,4,8], use of coughed oropharyngeal airway (COPA) or laryngeal mask airway (LMA) in place of endotracheal tube (ETT)[10,12-14], use of smaller size endotracheal tubes[5,6], minimizing cuff seal pressure[15-17] (the recommended cuff pressure is less than 25 mmHg), minimizing tube cuff-tracheal contact area[6,8], use of tubes with high volume-low pressure cuffs[18], use of lidocaine to fill the tracheal tube cuff[10,19,20], use of tampons instead of gauze for throat packing[21], non-steroidal anti-inflammatory drugs (NSAIDS) for gauze pack[22], and topical steroids[23,24]. All these have met with varied results and the incidence of sore throat has been distressingly high.

Beclomethasone dipropionate is a topical corticosteroid having glucocorticoid but no mineralocorticoid activity. It was the first corticosteroid available in inhalation form and is used to treat acute bronchial asthma. One puff of beclomethasone dipropionate inhaler delivers 50 µg of the drug. Its systemic absorption is

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minimal. It undergoes extensive first pass metabolism in the liver so that only a small amount of it reaches the systemic circulation. The 10 to 20% of its inhaled dose is not swallowed and is deposited in the airway. Inhaled beclomethasone reduces airway inflammation but its action is not immediate.

This study was carried out to determine the nature and severity of sore throat following endotracheal anaesthesia and assess reduction of symptoms by preoperative use of beclomethasone inhalation.

PATIENTS AND METHODS

This randomized controlled trial was carried out at Combined Military Hospital, Rawalpindi from October 2002 to April 2003. A total of 200 patients were included in the study selected by non-probability convenience sampling. Prior approval of the study was taken from hospital ethics committee and informed consent was obtained from the patients.

Patients of either gender aged between 18–60 years without having any symptoms of a disease other than for which being operated upon and undergoing surgery with general anaesthesia of >1 hour duration were included in the study. However, patients with pre-existing sore throat, difficult airway, smoking, chronic obstructive pulmonary disease (COPD), recurrent tonsillitis/ pharyngitis, sensitivity to non-steroidal anti-inflammatory drugs (NSAIDS)/ opioids and patients having American Society of Anaesthesiologists (ASA) class 3 or 4 or undergoing emergency surgery were excluded from the study.

The patients were randomly divided by means of a random table into two groups namely A and B of 100 patients each. Just before the start of procedure the patients were made to sit on the operation table, inhaler of beclomethasone was prepared and one puff given to every patient included in group A, while patients in group B were not offered beclomethasone inhalation. All the patients were exposed to same anaesthetic technique.

It was a double blinded study and patients, unaware of their group were interviewed in a standard fashion by a blind investigator at 6, 12, 24 and 48 hours after the procedure. Patients were asked directly whether they had experienced throat complaint and its association with daily activities like pain at rest, voice changes (hoarseness), pain on talking (dysphasia), pain on swallowing (dysphagia) and pain on coughing, from the time of their operation until the interview. This was graded by the patient as none (no complaint), mild (mild discomfort or pain), moderate (moderate discomfort or pain), or severe (severe discomfort or pain). The observations were recorded on a questionnaire.

Descriptive statistics were used to describe the results. Data was entered in SPSS version 11.0 and statistical analysis was done using unpaired student's t-test and the chi-square test. A p value <0.05 was considered statistically significant.

RESULTS

Table-1 shows the characteristics of the patients included in the study. In group A, 10 patients developed sore throat (10%), all having mild symptoms while in group B, 55 patients developed sore throat (55%) (p <0.01) out of which 22 (22%) scored mild, 13 (13%) had moderate and 20 (20%) had severe sore throat (table-2). All of these patients reported complaints in first 6 hours; after this increasing pain was recorded.

In the beclomethasone group, 1 (1%) patient had pain at rest, 2 (2%) had voice changes, 3 (3%) had pain on talking, 1 (1%) had pain on swallowing and 3 (3%) had pain on coughing when questioned first at 6 hours. At 12 hours 1 (1%) had pain at rest, 1 (1%) had voice changes, 1 (1%) had pain on talking, 2 (2%) complained of pain on coughing and none complained of pain on swallowing (table-3).

In the control group, 5 (5%) patients had pain at rest, 11(11%) had voice changes, 13 (13%) had pain on talking, 11(11%) had pain on swallowing and 15 (15%) had pain on coughing

at 6 hours. At 12 hours 3 (3%) had pain at rest, 6 (6%) had voice changes, 7 (7%) had pain on talking, 8 (8%) had pain on swallowing and 11 (11%) had pain on coughing. At 24 hours 1 (1%) patient had pain at rest, 3 (3%) had voice changes, 4 (4%) had pain on talking, 5 (5%) had pain on swallowing and 7 (7%) had pain on coughing. After 48 hours of surgery patients in this group still had throat pain although the complaints were reduced. No patient had pain at rest, 1 (1%) had voice changes, 2 (2%) had pain on talking, 3 (3%) had pain on swallowing and 3 (3%) had pain on coughing (table-3).

Table-1: Characteristics of patients included in the study of group A and group B (n=200)

Characteristics of patients	Group "A" (study group) n=100	Group "B" (control group) n=100	*p* value
Age Range (years) Mean (years)	 25 - 56 33.6 ± 3.2	 21 - 55 32.2 ± 2.9	>0.05
Male/Female ratio	2.7: 1	1.19:1	>0.05
Weight (kilograms)	72.4 ± 6.69	72.8 ± 6.20	>0.05
Height (centimeters)	166.9 ± 5.70	167.2 ± 4.39	>0.05
ASA (1/2)	80/20	83/17	>0.05
Bucking or coughing during intubation	10%	13%	>0.05
Duration of operation (minutes)	87.8 ± 7.6	90.3 ± 3.4	>0.05

(No significant differences between groups)

Table-2: Occurrence and severity of postoperative sore throat in two groups after 48 hours.

		None	Mild	Moderate	Severe	Total
Study group (Group A)	n	90	10	-	-	10
	%	90	10	-	-	10%
Control group (Group B)	n	45	22	13	20	55
	%	45	22	13	20	55%

p <0.01 (Occurrence of sore throat compared in two groups).

Table-3: Distribution of symptoms in beclomethasone group (group A) and control group (group B).

Sore throat symptoms		Time interval elapsed after surgery				*p* value
		6 hours	12 hours	24 hours	48 hours	
Pain at rest	Group A	1 (1%)	1 (1%)	-	-	< 0.05
	Group B	5 (5%)	3 (3%)	1 (1%)	-	
Voice changes	Group A	2 (2%)	1 (1%)	-	-	< 0.05
	Group B	11 (11%)	6 (6%)	3 (3%)	1 (1%)	
Pain on talking	Group A	3 (3%)	1 (1%)	1 (1%)	-	< 0.05
	Group B	13 (13%)	7 (7%)	4 (4%)	2 (2%)	
Pain on swallowing	Group A	1 (1%)	-	-	-	< 0.05
	Group B	11 (11%)	8 (8%)	5 (5%)	3 (3%)	
Pain on coughing	Group A	3 (3%)	2 (2%)	1 (1%)	-	< 0.05
	Group B	15 (15%)	11 (11%)	7 (7%)	3 (3%)	

The results of our study show that there is a significant reduction in the incidence of sore throat following endotracheal anaesthesia with

the use of beclomethasone dipropionate inhalation preoperatively. On the basis of the results the calculated *p* value is < 0.01 (by comparing the occurrence of sore throat in two groups) which is statistically significant.

DISCUSSION

Sore throat is a common postoperative complication and tracheal intubation is a major source of trauma to the airway mucosa, resulting in postoperative sore throat with reported incidence of 21-65%[1-4]. 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, as well as the method of questioning.

In our study, there were no significant differences in age, body weight, height, sex ratio, ASA status, grazes or duration of operation between the patients of two groups (table-1). The occurrence of sore throat after tracheal intubation in control group of our study was 55%, which is comparable to other studies indicating postoperative sore throat incidence of 90% and 35%[7,10], while that in beclomethasone group it was 10%.

We found that the occurrence and severity of postoperative sore throat were reduced by the use of one puff of beclomethasone inhaler from 55% to 10% after endotracheal intubation. The results of our study are comparable to previous studies[24]. With the technique of using beclomethasone inhaler in this study, we still had an occurrence of sore throat in the study group of 10%. The beclomethasone puff directed towards the trachea did not prevent this.

The cause of sore throat associated with endotracheal anaesthesia might be a result of localized trauma, leading to aseptic inflammation of pharyngeal mucosa. Alternatively, postoperative reaction of tissues, with oedema and congestion extending from the operative site may be an associated factor inducing pain[26]. Dryness and inflammation of the oral cavity in the postoperative period due to mouth breathing in patients who underwent nasal surgery might be another contributing factor[25]. We suspect that late onset and persistence of moderate or severe pain in control group reflects a more gradually developing local inflammation. Reduction of this inflammation by local beclomethasone may explain the decrease in complaints.

CONCLUSION

Postoperative sore throat after general anaesthesia is common and beclomethasone dipropionate inhaler is highly effective in its prevention. It reduces both the occurrence and severity of sore throat. Its use should be recommended before tracheal intubation for general anaesthesia.

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