

## Effect of Intracuff Paracetamol 1.0% W/V in Prevention of Emergence Coughing and Sore throat

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### Abstract:

Endotracheal intubation is a common procedure under general anaesthesia, but it can result in a number of airway complications. The study's main goal is to determine whether intra-Tracheal cuff paracetamol 1.0% w/v reduces moderate to severe emergence coughing in general anaesthesia patients after tracheal extubation and during the post-operative period, as measured by the modified Minogue scale. This study also showed that 1% paracetamol prevents cuff pressure rise. Anaesthesia duration and postoperative tracheo-laryngeal morbidity were also examined. Material and Methods: A prospective, randomised, comparative study was planned on patients undergoing general anaesthesia using entotracheal intubation in the Department of Anaesthesiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamilnadu. This study comprised 18-65-year-old ASA I and II patients without comorbidities. The study eliminated those who needed 3 or more laryngoscopy or bougie intubation attempts. Result: In this study showed a substantial decrease in sore throat and cough compared to the control group. Intracuff paracetamol also reduces emerging cough and post-procedure sore throat. Conclusion: Intracuff paracetamol lowers post-surgery coughing. Intracuff paracetamol also reduced sore throat sensations overall.

**Keywords:** Endotracheal intubation, Paracetamol 1.0% w/v, Intracuff paracetamol, post-surgery coughing, modified Minogue scale.

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### Introduction

Endotracheal intubation is one of the most common procedure under general anaesthesia, but it can lead to a series of airway complications[1]. The incidence of post-operative sore throat, often known as POST, has been estimated to be as high as 45% of patients. The physiological repercussions of peri-extubating coughing can lead to substantial problems, such as neck haematoma following thyroidectomy or carotid endarterectomy, wound dehiscence after laparotomy, and intracerebral haemorrhage after intracranial surgery[2]. We prepare for what we call a "smooth emergence," with the goal of reducing the amount of coughing that occurs and, as a result, avoiding any potential difficulties.

In an effort to cure and prevent it, numerous analgesics, anaesthetic formulations, and intracuff

agents have been used; nevertheless, it is currently unknown which one is the most successful. The primary objective of the study is to evaluate the effect of intra-Tracheal cuff paracetamol 1.0% w/v in decreasing the incidence of moderate to severe emergence coughing for patients undergoing surgery in general anaesthesia following tracheal extubating and during the post-operative period, as defined by the modified Minogue scale[3]. This study was also carried out to demonstrate the significance of using paracetamol at a concentration of 1% in the avoidance of a rise in cuff pressure. Additionally, the investigation was carried out to record the duration of anaesthesia and its impact on the incidence of postoperative tracheo-laryngeal morbidity.

## Material and Methods

A prospective, randomized, comparative study was planned to conduct on patients undergoing general anaesthesia through endotracheal intubation in Department of Anaesthesiology, Velammal Medical College Hospital And Research Institute, Madurai, Tamilnadu. Patients in the age group of 18-65 years, fit under ASA I and II with no adverse comorbidities were included in this study. While those who required 3 or more attempts at laryngoscopy or bougie for intubation were excluded from the study. Those cases where we faced difficulty during endotracheal insertion were also exempted. Trauma during procedure, as evidenced by blood on cuff after extubation or blood stained secretions while suctioning before extubation, Mallampatti score 4, those who had preoperative sore throat (edema /inflammation noticed during laryngoscopy) or already on analgesics or steroids (systemic or inhaled) and hoarseness of voice or respiratory infection were also excluded.

Patients scheduled for surgeries under general anaesthesia were randomly allocated to one of the two study groups (Group C & P), about 30 patients in each group. Randomisation was carried out using time scale-a type of simple random sampling. Group 'P' patients will be given paracetamol 1.0 %w/v intracuff while fixing the endotracheal tube. In C group, ETT cuff was filled with saline to prevent air leak during positive pressure ventilation guided with cuff manometer.

Care was taken to ensure that starting cuff pressure as approximately 20 cm H<sub>2</sub>O and maintain it between 20-30 cm H<sub>2</sub>O adequate enough to just prevent leak during positive pressure ventilation.

Identical standard anaesthetic principles and technologies were employed for both the groups. They were preoxygenated with 100% oxygen for 3 min followed by intravenous glycopyrrolate 0.2 mg, midazolam 1 mg, and fentanyl 2 µg/kg. Patients were induced with propofol 1.5 to 2.5 mg/kg and were mask ventilated with isoflurane 1% in oxygen.

Vecuronium 0.1 mg/kg IV was administered after induction, and 3 min later, the patients were intubated following a gentle and quick laryngoscopy lasting not more than 15 s with a low-pressure, high-volume cuffed endotracheal tube (ETT). Volume and cuff pressure of saline and paracetamol injected in the cuff were noted at start and end of surgery.

Total duration of anaesthesia was also noted. At the end of surgery, ondansetron 0.1 mg/kg was given intravenously and the residual muscle paralysis was reversed with neostigmine 0.05 to 0.07 mg/kg and glycopyrrolate 10 mg/kg IV. Extubation was performed following gentle oro-pharyngeal suctioning. Postoperatively all patients received paracetamol 1 gm at 8-h interval and tramadol 1.5 mg/kg on demand intravenously. Immediately after extubation, an independent observer blinded from the study group recorded the presence or absence of coughing and sore throat. Similarly, in postoperative care unit, nursing staff in ICU who was unaware of the study recorded the occurrence of coughing and sore throat at 2hrs, 6 hrs, 12 hrs and 24 hrs were recorded. Coughing was recorded as present or absent. Severity of cough is graded according to modified Minogue scale. Severity of sore throat is also graded.

### Modified Minogue Scale:

**Table 1:**

Outcome categorization	Grade and severity description	Modified Minogue scale
None to mild	Grade 1(none)	No coughing or muscular stiffness
	Grade 2 (mild)	Coughing once or twice or transient cough response to removal of tracheal tube that resolved with extubation
Moderate to severe	Grade 3(moderate)	≤ 3 coughs lasting 1-2s, or total duration of coughing last ≤ 5s
	Grade 4 (severe)	≤ 4 coughs with each lasting >2s, total duration of coughing last >5s.

**Table 2:**

Post score	Definition
0	No sore Throat
1	Mild sore Throat (complain of sore throat only on asking)
2	Moderate sore Throat (complain of sore throat on this/her own)
3	Severe sore throat (change of voice or hoarseness associated with throat pain)

**Result**

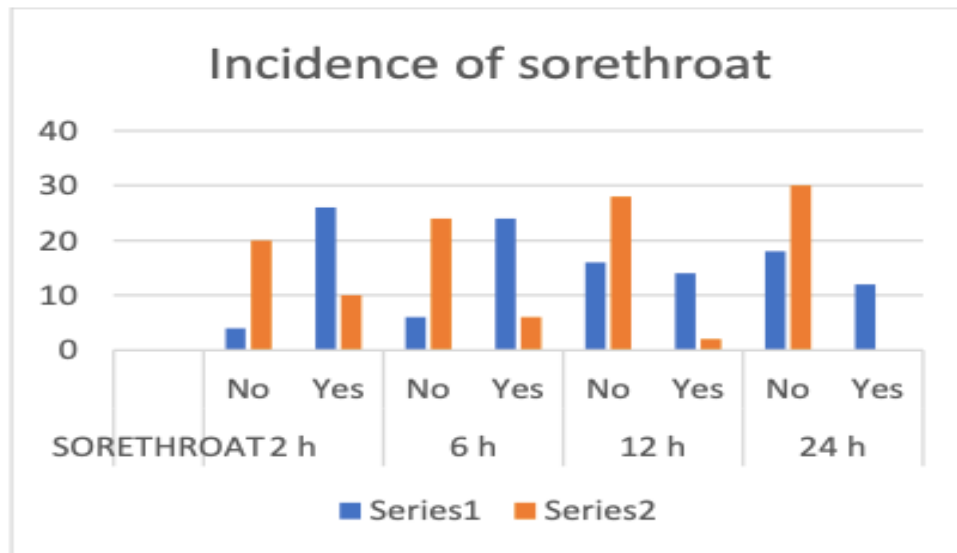
In our present study there was statistically significant decrease in incidence of sore throat and cough compared to the control group. This observation is also in favour of efficacy of intracuff paracetamol in decreasing the incidence of emergence cough and post procedure sore throat.

**Table 3: Sore Throat**

S. No	Duration of Sore throat	Number of patient with/without Sore throat	Control group	Paracetamol control group	Significant
1	2 h	No	4	20	<0.001*
		Yes	26	10	
2	6 h	No	6	24	<0.001*
		Yes	24	6	
3	12 h	No	16	28	<0.001*
		Yes	14	2	
4	24 h	No	18	30	<0.001*
		Yes	12		

**Table 4: Postoperative Cough**

S. No	Duration of Sore throat	Number of patient with/without Sore throat	Control group	Paracetamol control group	Significant
1	2 h	No	5	20	<0.001*
		Yes	25	10	
2	6 h	No	14	28	<0.001*
		Yes	16	2	
3	12 h	No	23	30	<0.024*
		Yes	7	-	
4	24 h	No	25	30	<0.237
		Yes	5	-	



**Figure 1: Incidence of sore throat**

Up to six hours after surgery, research has demonstrated that intracuff administration of paracetamol results in a statistically significant reduction in the incidence of emerging cough and sore throat. In addition, the use of Intracuff paracetamol was found to reduce both the frequency and severity of sore throat symptoms across the board.

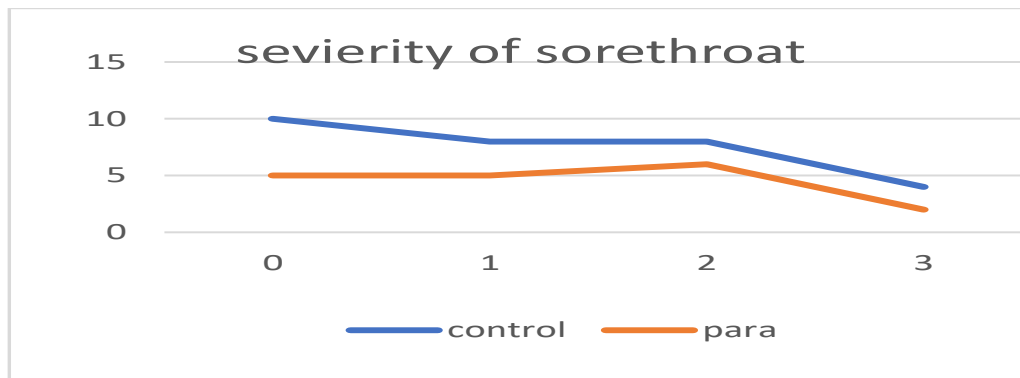


Figure 2: Severity of sore throat

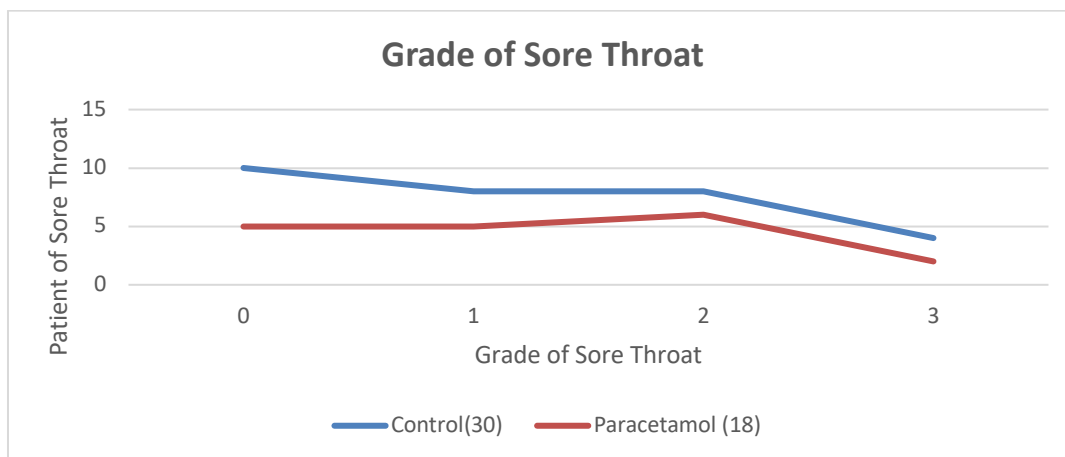


Figure 3 :

## Discussion

The research that was conducted by Desai et al., shown that the use of intracuff alkalinized lignocaine and dexamethasone was superior to the use of saline for the purpose of preventing POST and POC. Based on the concept presented in the previous research, we decided to conduct our own investigation to determine whether or not intracuff paracetamol is effective in reducing the severity of post-intubation sore throat and cough[4]. When compared to the control group, our research demonstrated that the use of intracuff paracetamol resulted in a much lower incidence of sore throat and cough following extubation[5]. The possible causes of cough and sore throat include an aseptic inflammatory process brought on by irritation of the pharyngeal mucosa brought on by laryngoscopy, and ongoing irritation of the tracheal mucosa brought on by the presence of the ETT cuff, which was remedied by the liquid paracetamol that was injected into the cuff of the ETT[6]. The anti-inflammatory effects of paracetamol, which may be responsible for the putative mode of action of intracuff paracetamol, include the inhibition of leukocyte migration, the attenuation of lysosome release, and the reduction of fibroblast proliferation[7]. Only a negligible portion of the intracuff paracetamol is able to be adsorbed into the

polymer of the cuff, disperse, and eventually end up in the tracheal mucosa. Even in such a little amount, the substance is able to have a considerable anti-inflammatory effect on the mucosa of the trachea.

## Conclusion

It has been demonstrated that intracuff administration of paracetamol significantly reduces the incidence of emerging cough following surgical procedures. In addition, the use of Intracuff paracetamol was found to reduce both the frequency and severity of sore throat symptoms across the board.

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