

## ORIGINAL RESEARCH

**Budesonide suspension & POST in surgical patients following endotracheal intubation****Dr. Mridula Agarwal<sup>1</sup>, Dr. Rubal Singhal<sup>2</sup>, Dr. Rajeev Kumar Das<sup>3</sup>, Dr. Manu Seth<sup>4</sup>**<sup>1,3,4</sup>Associate professor, <sup>2</sup>Assistant professor, Department of Anaesthesiology TS Misra Medical College Lucknow, U.P., India**Corresponding author**

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**Received:** 12-12-2022**Revised:** 14-01-2023**Accepted:** 16-01-2023**ABSTRACT:****Background:** Post-operative sore throat (POST) is highly common with the incidence rate as high as 21%–71.8%. The present study was conducted to assess compare the effects of inhaled budesonide suspension, administered using a metered dose inhaler, on occurrence of POST in surgical patients following endotracheal intubation.**Materials & Methods:** 90 patients of either gender with American society of Anaesthesiologists (ASA) physical status I–II scheduled for short elective laparoscopic surgeries under general anaesthesia with endotracheal intubation were divided 2 groups of 45 each. Group I received 200 µg budesonide inhalation suspension, using a metered dose inhaler, 10 min before intubation, and repeated 6 hours after extubation. In group II, no such intervention was performed. The incidence and severity of POST was recorded.**Results:** There were 28 males and 17 females in group I and 25 males and 20 females in group II. ASA grade I was 30 in group I and 31 in group II and grade II in 15 in group I and 14 in group II. Mallampatti score 1 was seen in 35 and 32 and 2 in 10 and 13 in group I and II respectively. Number of attempts at intubation was 1 in 36 and 37 and 2 seen among 9 and 8. Rescue therapy for POST was seen among 8 and 25 in group I and II respectively. The difference was significant ( $P < 0.05$ ). POST at 2 hours, 6 hours, 12 hours and 24 hours was seen in 25% and 70%, 12% and 65%, 6% and 62% and 2% and 58% in group I and II respectively. The difference was significant ( $P < 0.05$ ).**Conclusion:** Inhaled budesonide suspension is effective and efficient in reducing the incidence and severity of POST significantly.**Key words:** Budesonide, POST, Corticosteroids**Introduction**Post-operative sore throat (POST) is highly common with the incidence rate as high as 21%–71.8%.<sup>1</sup> In this direction, numerous drugs such as ketamine, lidocaine and magnesium sulphate are commonly used and the method of administration of these agents are either gargling or by nebulisation. These have tendency to minimize symptoms.<sup>2</sup> Corticosteroids are commonly used to inhibit and lessen post-operative throat complications among intubated patients. Intravenous corticosteroids are not recommended as compared to inhaled corticosteroids due to side effects such as fluid retention, delayed wound healing and glucose intolerance.<sup>3</sup>Drug delivery with metered dose inhaler would avoid the need of additional equipment such as nebulisers or atomisers, and avoiding the need of support from nursing professionals too. Other useful advantage is that this method is regarded as non-complex and more time-saving with high patient satisfactoriness.<sup>4</sup> Budesonide is a corticosteroid with potent non-halogenated glucocorticoid and weak mineralocorticoid. It has the ability to be administered in the form of atomization inhalation. Its biggest advantage is lipophilicity.<sup>5</sup> The present study was conducted to assess compare the effects of

inhaled budesonide suspension, administered using a metered dose inhaler, on occurrence of POST in surgical patients following endotracheal intubation.

### Materials & Methods

The present study comprised of 90 patients of either gender with American society of Anaesthesiologists (ASA) physical status I–II scheduled for short elective laparoscopic surgeries under general anaesthesia with endotracheal intubation. The written consent was obtained from all patients.

Data such as name, age, gender etc. was recorded. Patients were divided 2 groups of 45 each. Group I received 200 µg budesonide inhalation suspension, using a metered dose inhaler, 10 min before intubation, and repeated 6 hours after extubation. In group II, no such intervention was performed. The incidence and severity of POST was recorded. The incidence of post-operative hoarseness and cough was also recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

### Results

**Table I: Distribution of patients**

Groups	Group I	Group II
M:F	28:17	25:20
ASA I	30	31
II	15	14

Table I shows that there were 28 males and 17 females in group I and 25 males and 20 females in group II. ASA grade I was 30 in group I and 31 in group II and grade II in 15 in group I and 14 in group II.

**Table II: Comparison of parameters**

Parameters	Variables	Group I	Group II	P value
Mallampatti score	1	35	32	0.04
	2	10	13	
Number of attempts at intubation	1	36	37	0.01
	2	9	8	
Rescue therapy for POST	Yes	8	25	0.03
	No	37	20	

**Graph I: Comparison of parameters**

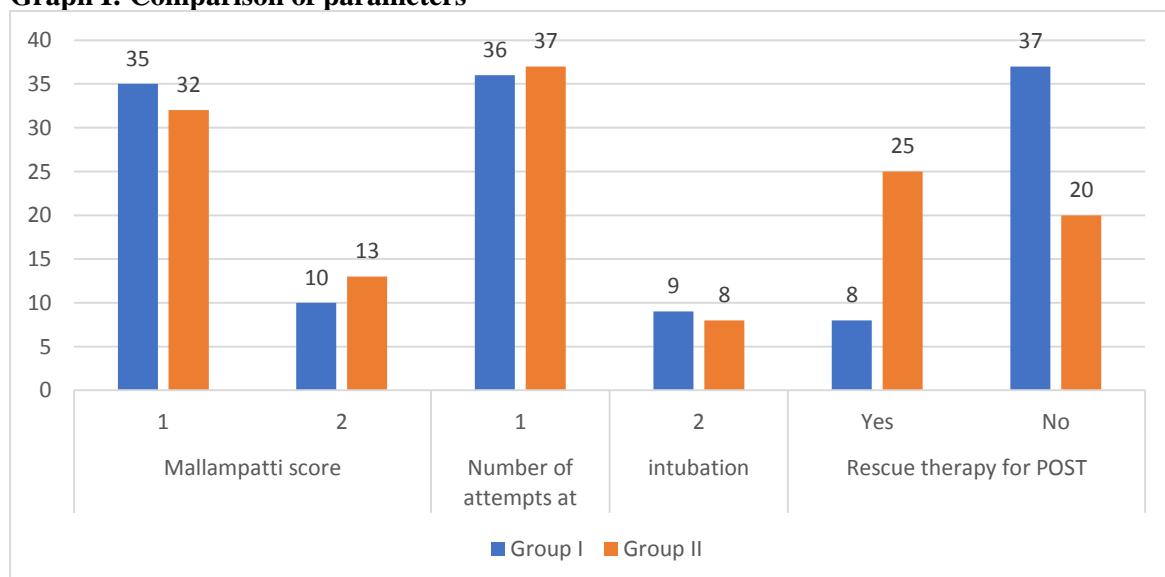


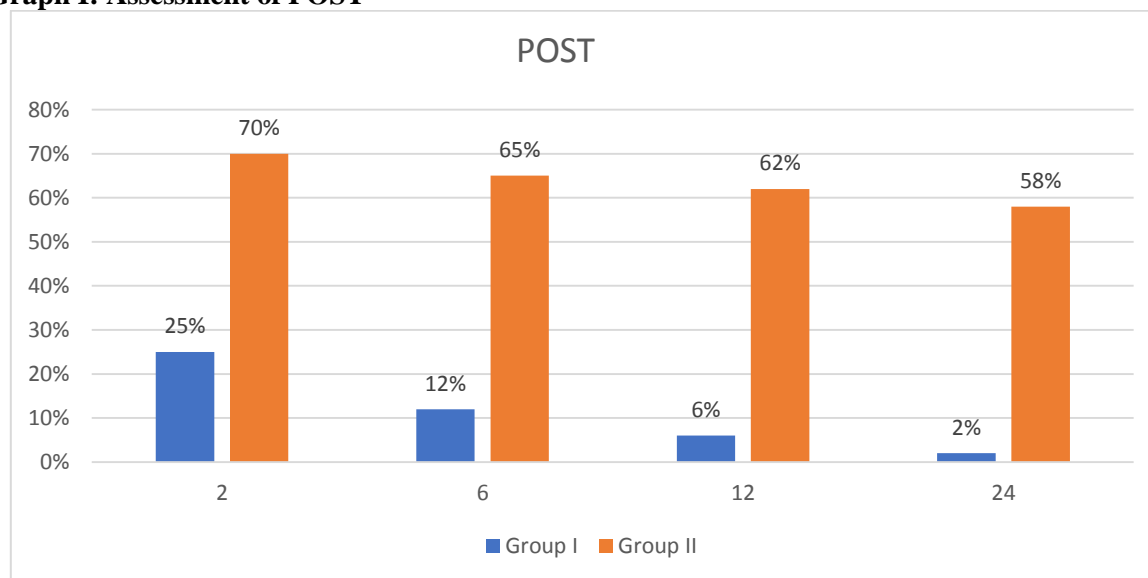
Table II, graph I shows that Mallampatti score 1 was seen in 35 and 32 and 2 in 10 and 13 in group I and II respectively. Number of attempts at intubation was 1 in 36 and 37 and 2 seen among 9 and 8. Rescue therapy for POST was seen among 8 and 25 in group I and II respectively. The difference was significant ( $P < 0.05$ ).

**Table III: Assessment of POST**

Duration (hours)	Group I	Group II	P value
2	25%	70%	0.05
6	12%	65%	0.02
12	6%	62%	0.01
24	2%	58%	0.01

Table III, graph I shows that POST at 2 hours, 6 hours, 12 hours and 24 hours was seen in 25% and 70%, 12% and 65%, 6% and 62% and 2% and 58% in group I and II respectively. The difference was significant ( $P < 0.05$ ).

**Graph I: Assessment of POST**



## Discussion

Post-operative sore throat (POST) is highly common with the incidence rate as high as 21%–71.8%. The main symptoms linked with it are hoarseness of voice and cough. POST is leading cause of late patients discharge. It is one of the challenging tasks among anaesthetists to handle. In order to improve post-anaesthesia care quality, there is high need to induce prophylactic management of POST.<sup>6</sup> Budesonide is a corticosteroid with potent non-halogenated glucocorticoid and weak mineralocorticoid. It has the ability to be administered in the form of atomization inhalation. Its biggest advantage is lipophilicity.<sup>7</sup> It has the capacity to shorten the anesthesia recovery time and lessens post operative anaesthesia related complications in contrast to other systemic corticosteroids and it may enhance the vascular tension of throat.<sup>8</sup> It causes decrease in capillary permeability and reduction of edema formation and inflammatory reactions of the local tissues.<sup>9</sup> The present study was conducted to assess compare the effects of inhaled budesonide suspension, administered using a metered dose inhaler, on occurrence of POST in surgical patients following endotracheal intubation.

We found that there were 28 males and 17 females in group I and 25 males and 20 females in group II. ASA grade I was 30 in group I and 31 in group II and grade II in 15 in group I and 14 in group II. Kashefi P et al<sup>10</sup> compared nebulized budesonide and intravenous dexamethasone administration before extubation in prevention of post extubation complications in 90 patients. There was no significant difference between the two but nebulized budesonide was recommended for prevention of post-extubation complications in ICU patients regarding lower systemic absorption of budesonide.

We observed that Mallampatti score 1 was seen in 35 and 32 and 2 in 10 and 13 in group I and II respectively. Number of attempts at intubation was 1 in 36 and 37 and 2 seen among 9 and 8. Rescue therapy for POST was seen among 8 and 25 in group I and II respectively. Rajan et al<sup>11</sup> divided 46 patients undergoing laparoscopic surgeries into 2 groups. Group A received 200 µg budesonide inhalation suspension whereas no such intervention was performed in group B. Results showed that less patients in group A had post at various intervals of time as compared to group B. Group B had post-operative hoarseness of voice and cough at all-time. Severity and incidence of POST showed downward trends in both groups over time, and by 24 hours no patient in Group A had sore throat. We found that POST at 2 hours, 6 hours, 12 hours and 24 hours was seen in 25% and 70%, 12% and 65%, 6% and 62% and 2% and 58% in group I and II respectively. Singh et al<sup>12</sup> divided 40 patients into 2 groups of 20 each. Group A (20) patients received 200µg budesonide inhalation suspension and group B (20) patients did not receive anything. Post-operative sore throat was assessed and was found that incidence of POST was significantly higher among subjects of Group B in comparison to subjects of group A at different time intervals.

### Conclusion

Authors found that inhaled budesonide suspension is effective and efficient in reducing the incidence and severity of POST significantly.

### References

1. Bajwa SJ, Takroui MS. Innovations, improvisations, challenges and constraints: The untold story of anesthesia in developing nations. *Anesth Essays Res.* 2014;8:1–2.
2. Yamanaka H, Hayash Y, Watanabe Y et al. Prolonged hoarseness and arytenoid cartilage dislocation after tracheal intubation. *BJA.* 2009; 10: 452-455.
3. Zhang W, Zhao G, Li L, Zhao P et al. Prophylactic administration of corticosteroids for preventing postoperative complications related to tracheal intubation: a systemic review and meta-analysis of 18 randomized controlled trials. *Clin Drug Investig.* 2016;36:255-65.
4. Rauh R, Hemmerling TM, Rist M, Jacobi KE. Influence of pneumoperitoneum and patient positioning on respiratory system compliance. *J Clin Anesth.* 2001;13:361–5.
5. Hirvonen EA, Poikolainen EO, Pääkkönen ME, Nuutinen LS. The adverse hemodynamic effects of anesthesia, head-up tilt, and carbon dioxide pneumoperitoneum during laparoscopic cholecystectomy. *Surg Endosc.* 2000;14:272–7.
6. Huang C, Yang M, Jiang R et al. Effect of premedication with budesonide aerosol inhalation on the incidence of respiratory adverse events during anesthesia recovery period in pediatric patients. *Biomedical Research.* 2018;29:437-441.
7. Gerges FJ, Kanazi GE, Jabbour-Khouri SI. Anesthesia for laparoscopy: A review. *J Clin Anesth.* 2006;18:67– 78. 2. Bajwa SJ, Kalra S. A deeper understanding of anesthesiology practice: The biopsychosocial perspective. *Saudi J Anaesth.* 2014;8:4–5.
8. Scude I, Phillip E. Postoperative Sore Throat: More answers than questions. *Anaesthesia and analgesia.* 2010; 111: 831-832.
9. Chen YQ, Wang JD, Xiao J et al. Prophylactic effectiveness of budesonide inhalation in reducing postoperative throat complaints. *J Anesth Clin Res* 3:225.
10. Kashefi P, Abbasi A, Abbasi M, Davoodi L, Abbasi S et al. Comparison of the efficacy of nebulized budesonide and intravenous dexamethasone administration before extubation in prevention of post-extubation complications among patient admitted in intensive care unit. *Advanced Biomedical research* 2015;4:11.
11. Rajan S, Tosh P, Paul J, Kumar L. Effect of inhaled budesonide suspension, administered using a metered dose inhaler, on post-operative sore throat, hoarseness of voice and cough. *Indian J Anaesth* 2018;62:66-71.
12. Anupam Narayan Singh, Hirday Kumar, Niraj Kumar, Harshvardhan, Harshitha Gangishetty. Use of preoperative inhaled budesonide to reduce postoperative sore throat incidence after endotracheal intubation. *International Journal of Contemporary Medical Research* 2019;6(4):1-3.