Effectiveness of a Preoperative Single Dose Intravenous Dexamethasone in Reducing the Prevalence of Postoperative Sore Throat after Endotracheal Intubation

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Objective: *To evaluate the effectiveness of two-different doses of prophylactic dexamethasone intravenous administration in reducing the prevalence of postoperative sore throat following general endotracheal anesthesia.*
Material and Method: *All patients (105 cases) of different procedures of elective surgery scheduled to have general anesthesia performed with endotracheal intubations were included. The subjects randomized into three pre-operative intravenous substance/drug administrations, group I (35 cases) with normal saline 2 ml, group II (35 cases) with dexamethasone 4 mg, and group III (35 cases) with dexamethasone 8 mg, respectively. The prevalence of sore throat and its severity was assessed, using visual analogue scale (VAS), scores of 0 to 10; 0 = no pain, and 10 = most severe pain.*
Results: *Among three groups, the duration of surgery, and intubation-induced trauma had no statistical significance. The prevalence of sore throat at 1-hour/24-hour postoperative was 48.6/48.6%, 54.3/28.6%, and 54.3/42.9% in group I, II, and III respectively, and without statistical significance.*
Conclusion: *The intravenous dexamethasone had no significant effectiveness against postoperatively sore throat after endotracheal intubation.*

Keywords: *Dexamethasone, Endotracheal intubation, Postoperative sore throat*

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Postoperative sore throat, with the incidence of 40 to 90%[1-5], is a common complaint and distressing sequence following general anesthesia. There are many contributing factors such as female gender, history of smoking or lung diseases, postoperative nausea[1], intubation-induced trauma, large tracheal tube size, cuff design, and duration of surgery[1,3,5]. The underlying mechanisms of sore throat are thought to be irritation and inflammation from endotracheal tube insertion and cuff inflation.

Preventive measures to diminish these effects such as use of a smaller endotracheal tube to reduce contact area with mucosa[6,7], low intra-cuff pressure[8], cuff filled with saline or xylocaine to prevent cuff expansion during anesthesia[4,9], inhalation of steroid[10], and steroid-coated endotracheal tube have been reported[6,11-13].

Dexamethasone is a potent corticosteroid with anti-inflammatory, analgesic, and anti-emetic actions. It has minimal side effects after a single-dose administration. Dexamethasone is shown to be an effective treatment for moderate to severe pharyngitis. Although there were studies showing the effectiveness of prophylactic high dose intravenous dexamethasone in preventing postoperative sore throat[14,15], there has yet been any study on its different dose effect. The objective of the present study was to evaluate the effect of normal saline, dexamethasone 4 mg, and dexamethasone 8 mg given preoperatively, on the prevalence of postoperative sore throat caused after general anesthesia with endotracheal intubation.

Material and Method

The present study was performed after the approval of the Ethical Committee, Faculty of Medicine,

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Prince of Songkla University. Between September 11, 2009 and February 25, 2010, the patients who underwent elective surgery, received general anesthesia with endotracheal intubation, aged between 15 to 65 years, and ASA class I to II were enrolled into the present study. Exclusion criteria were the difficult intubation of more than two attempts, head and neck surgery, known history of sensitivity or allergy to steroids, preoperative complaint of sore throat or respiratory tract infection, obesity (BMI more than 28 kg/m^2), diabetes mellitus, pregnancy, during corticosteroids or calcium channel blockers administration, duration of surgery more than 4 hours, required intubation and mechanical ventilator in postoperative period.

The subjects were randomized in three groups, group 1 (35 cases) with normal saline 2 ml, group II (35 cases) with dexamethasone 4 mg, and group III (35 cases) with dexamethasone 8 mg, respectively. After pre-oxygenation, anesthesia was induced with intravenous thiopental or propofol and morphine, vecuronium was then given for intubation. A single use PVC tracheal tube (Hi-Lo^{TM} Mallinckrodt) with low-pressure-high-volume cuff, of size 7.5 mm internal diameter for female and 8.0 mm internal diameter for male was used. No lubricant was used.

No intraoperative administration of ondansetron or metoclopramine was given. A blinded member of the research team assessed the patients at 1- and 24-hour postoperatively. The patients were asked about the occurrence of sore throat and its intensity was assessed using visual analogue scale scores (VAS), scores of 0 to 10; 0 = no pain, and 10 = most severe pain, as well as the cough, hoarseness, and adverse events of nausea/vomiting.

The data of delay suspicion and isolation were compared with of non-delay suspicion and isolation with student t-test for continuous variables and with Chi-square test (x^2) or Fisher's exact test for numeric variables. Significance was determined with p-value less than 0.05.

The demographic data was analyzed using the Fisher's exact test (categorical data) and the Student's t-test (parametric data). Continuous data was analyzed by un-paired Student's t-test for normal distribution data and by Mann-Whitney U test for non-normal distribution data. The results are expressed as mean $\pm$ standard deviation (SD) for normal distribution data and median (range) for non-normal distribution data. The p-value less than 0.05 is considered to be statistically significant. The statistical analysis was examined with Statistical Package for the Social Sciences (SPSS).

Results

The 105 patients were analyzed. The mean age was 41.57 $\pm$ 11.23 years. The majority of patients were female (83.81%) with mean BMI of 23.94 $\pm$ 17.00, and the ASA class II were up to 61.9% with low proportion of smoking history (11.4%).

In Table 1, the contributing factors with scientific ground such as duration of surgery had no statistical significance. However, the intubation-induced trauma with bloodstained endotracheal tube was higher in group three than group one and two. The prevalence of sore throat at 1-hour/24-hour postoperative was 48.6/48.6%, 54.3/28.6%, and 54.3/42.9% in group I, II, and III, respectively, and without statistical significance. Accordingly, the severity of sore throat, cough, and nausea and vomiting were also insignificant.

Discussion

The result of the present study did not show the promising effect of preoperative intravenous dexamethasone in reducing the prevalence of post-operative sore throat compared with normal saline, and the efficacy was similar to the previous two studies[14,15]. The contradicting result may be explained from the mechanism of injury and pathophysiological viewpoints.

Table 1. Comparison of contributing factors and prevalence of sore throat among three different groups

	Group I normal saline (n = 35)	Group II 4 mg dexamethasone (n = 35)	Group III 8 mg dexamethasone (n = 35)	p-value
Duration of surgery (minutes $\pm$ SD)	105.91 $\pm$ 45.69	125.63 $\pm$ 51.58	115.74 $\pm$ 48.70	0.234
Intubation-induced trauma [number (%)]	1/35 (2.9%)	1/35 (2.9%)	6/35 (17.1%)	0.034
Postoperative 1-hour sore throat [number (%)]	17/35 (48.6%)	19/35 (54.3%)	19/35 (54.3%)	0.858
Postoperative 24-hour sore throat [number (%)]	17/35 (48.6)	10/35 (28.6%)	15/35 (42.9%)	0.213

Many confounding factors can affect the postoperative sore throat such as the different types of surgical procedure, and anesthetic protocol, as well as the contributing factors, and the preventive measures. Therefore, the insignificant prevalence of postoperative sore throat was attributed that the prophylactic effectiveness of dexamethasone in reducing the postoperative sore throat was not verified.

In conclusion, the intravenous dexamethasone had no significant effectiveness against post-operatively sore throat after endotracheal intubation.

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Potential conflicts of interest

None.

References

1. Biro P, Seifert B, Pasch T. Complaints of sore throat after tracheal intubation: a prospective evaluation. Eur J Anaesthesiol 2005; 22: 307-11.
2. Stride PC. Postoperative sore throat: topical hydrocortisone. Anaesthesia 1990; 45: 968-71.
3. Porter NE, Sidou V, Husson J. Postoperative sore throat: incidence and severity after the use of lidocaine, saline, or air to inflate the endotracheal tube cuff. AANA J 1999; 67: 49-52.
4. Estebe JP, Delahaye S, Le Corre P, Dollo G, Le Naoures A, Chevanne F, et al. Alkalinization of intra-cuff lidocaine and use of gel lubrication protect against tracheal tube-induced emergence phenomena. Br J Anaesth 2004; 92: 361-6.
5. Edomwonyi NP, Ekwere IT, Omo E, Rupasinghe A. Postoperative throat complications after tracheal intubation. Ann Afr Med 2006; 5: 28-32.
6. McHardy FE, Chung F. Postoperative sore throat: cause, prevention and treatment. Anaesthesia 1999; 54: 444-53.
7. Stout DM, Bishop MJ, Dwersteg JF, Cullen BF. Correlation of endotracheal tube size with sore throat and hoarseness following general anesthesia. Anesthesiology 1987; 67: 419-21.
8. Stenqvist O, Nilsson K. Postoperative sore throat related to tracheal tube cuff design. Can Anaesth Soc J 1982; 29: 384-6.
9. Estebe JP, Dollo G, Le Corre P, Le Naoures A, Chevanne F, Le Verge R, et al. Alkalinization of intracuff lidocaine improves endotracheal tube-induced emergence phenomena. Anesth Analg 2002; 94: 227-30.
10. el Hakim M. Beclomethasone prevents postoperative sore throat. Acta Anaesthesiol Scand 1993; 37: 250-2.
11. Ayoub CM, Ghobashy A, Koch ME, McGrimley L, Pascale V, Qadir S, et al. Widespread application of topical steroids to decrease sore throat, hoarseness, and cough after tracheal intubation. Anesth Analg 1998; 87: 714-6.
12. Selvaraj T, Dhanpal R. Evaluation of the application of topical steroids on the endotracheal tube in decreasing post-operative sore throat. J Anaesth Clin Pharmacol 2002; 18: 167-70.
13. Sumathi PA, Shenoy T, Ambareesha M, Krishna HM. Controlled comparison between betamethasone gel and lidocaine jelly applied over tracheal tube to reduce postoperative sore throat, cough, and hoarseness of voice. Br J Anaesth 2008; 100: 215-8.
14. Thomas S, Beevi S. Dexamethasone reduces the severity of postoperative sore throat. Can J Anaesth 2007; 54: 897-901.
15. Park SY, Kim SH, Lee AR, Cho SH, Chae WS, Jin HC, et al. Prophylactic effect of dexamethasone in reducing postoperative sore throat. Korean J Anesthesiol 2010; 58: 15-9.

ประสิทธิภาพของยา dexamethasone ทางหลอดเลือดดำครั้งเดียวก่อนผ่าตัดในการลดอุบัติการณ์ภาวะเจ็บคอหลังการผ่าตัดภายหลังใส่ท่อช่วยหายใจ

ศักดิ์ชาย เรืองสิน, ธันต์ชนก วนสุวรรณกุล, งามจิตต์ ภัทรวิทย์, วิศรา อะซิ่ม

วัตถุประสงค์: *ประเมินประสิทธิภาพของการให้ยา dexamethasone แบบป้องกันสองขนาดที่แตกต่างกันในการลดอุบัติการณ์ ภาวะเจ็บคอหลังผ่าตัดภายหลังการดมยาสลบใส่ท่อช่วยหายใจ*

วัสดุและวิธีการ: *ผู้ป่วยทั้งหมด (105 ราย) ที่ได้รับการผ่าตัดแบบไม่ฉุกเฉินด้วยวิธีการปฏิบัติต่างกัน ต่างได้รับการดมยาสลบใส่ท่อช่วยหายใจ ผู้ป่วยได้รับการแบ่งกลุ่มอิสระเป็น 3 กลุ่ม ได้รับสาร/ยาทางหลอดเลือดดำก่อนผ่าตัดแตกต่างกัน กลุ่ม 1 ได้รับสารน้ำเกลือ 2 มิลลิลิตร กลุ่ม 2 ได้รับยา dexamethasone ขนาด 4 มิลลิกรัม และกลุ่ม 3 ได้รับยา dexamethasone 8 มิลลิกรัมตามลำดับ ประเมินอุบัติการณ์ภาวะเจ็บคอด้วย visual analogue scale (VAS) คะแนน 0 ถึง 10 คะแนน 0 เท่ากับ ไม่เจ็บ และคะแนน 10 เท่ากับ เจ็บรุนแรงมากที่สุด*

ผลการศึกษา: *ระหว่าง 3 กลุ่ม ระยะเวลาผ่าตัดและการบาดเจ็บจากการใส่ท่อช่วยหายใจไม่แตกต่างอย่างมีนัยสำคัญ อุบัติการณ์ภาวะเจ็บคอที่ 1 ชั่วโมง/24 ชั่วโมงหลังผ่าตัด เท่ากับร้อยละ 48.6/48.6, 54.3/28.6 และ 54.3/42.9 ในกลุ่ม 1, 2 และ 3 ตามลำดับ และไม่มีความแตกต่างอย่างมีนัยสำคัญ*

สรุป: *ยา dexamethasone ทางหลอดเลือดดำไม่มีประสิทธิภาพแตกต่างอย่างมีนัยสำคัญต่อภาวะเจ็บคอหลังผ่าตัดตามหลังการใส่ท่อช่วยหายใจ*