ISSN: 2515-8260, Volume 10, Issue 01, 2023

To Compare the Effectiveness of Propofol Versus Dexamethasone for Preventing Postoperative Nausea and Vomiting After Ear, Nose, and Throat Surgery

1st author: Dr. Chhaya Suryawanshi (Professor and Head of Department)
Department of Anaesthesiology and Critical Care
Dr. DY Patil Medical College, Hospital and Research Centre
Pimpri, Pune-411018, Maharashtra, India
2nd author: Dr. Pati Sathvika (Resident)
Department of Anaesthesiology and Critical Care
Dr. DY Patil Medical College, Hospital and Research Centre
Pimpri, Pune-411018, Maharashtra, India

3rd author: Dr Dheeraj Gopal Ravindran (Resident)
Department of Anaesthesiology and Critical Care
Dr. DY Patil Medical College, Hospital and Research Centre
Pimpri, Pune-411018, Maharashtra, India

4th author: Dr. Reema Jawale (Resident)
Department of Anaesthesiology and Critical Care
Dr. DY Patil Medical College, Hospital and Research Centre
Pimpri, Pune-411018, Maharashtra, India
Corresponding Author: Dr. Pati Sathvika (Resident)
Department of Anaesthesiology and Critical Care
Dr. DY Patil Medical College, Hospital and Research Centre
Pimpri, Pune-411018, Maharashtra, India

ABSTRACT:

Back ground: When prophylaxis is not used, ENT operations have a significant incidence of postoperative emesis. Antiemetic use as a preventative measure may lower total PONV-related resource use and expenses, improving patient satisfaction. Numerous methods have been employed to reduce the incidence of PONV such as pharmacological interventions for prophylaxis, altering the anaesthetic technique, or combining them all for optimum protection. The present study was conducted with an aim to compare the effectiveness between propofol and dexamethasone in the prevention of postoperative nausea and vomiting after ear, nose and throat surgery and to study any adverse effects associated with these drugs.

Materials and methods: A total of 60 patients who underwent ENT surgeries were divided into two groups with 30 in each group. Group A received dexamethasone 8mg and Group B received propofol 0.5mg/kg after completion of surgery. The incidence and severity of PONV and associated adverse effects were documented at immediate post-op, 30 minutes, 1^{st} -, 6^{th} - , 12^{th} - ,

and 24th- hour after the administration of study drug. In addition, the requirement of rescue antiemetics in the overall 24 hours was documented.

Results: There was no statistically significant difference between the dexamethasone and propofol groups in terms of age, gender, body mass index (BMI), type of surgery, ASA status, or duration of anaesthesia and surgery. Incidence of severe PONV (3.3% versus 12%, p =0.008) were statistically significantly lower in group A compared to patients in group B over the 6th-12th hour time period. The mean time to first nausea episode in group A was significantly more compared to group B ($p<0.001$).

Conclusions: Although the efficacy of dexamethasone and propofol in preventing post-operative nausea and vomiting in ENT surgeries are comparable dexamethasone produced better PONV protection than propofol.

Key words: Postoperative nausea and vomiting, Dexamethasone, Propofol, ENT surgery

INTRODUCTION:

Post general anaesthesia, patients frequently complain of nausea and vomiting as post-operative discomfort.[1] Postoperative nausea and vomiting (PONV) has an incidence ranging from 40% to 75 % and costs healthcare workers considerable amount of time and resources. A multifactorial phenomenon, PONV can be brought on by a variety of receptor pathways at the central, peripheral, or both locations.[2] Age under fifty, female sex, previous history of PONV or motion sickness, history of smoking, obesity, factors associated to surgery and anaesthesia are some of the risk factors for PONV.[3,4,5] PONV may result from the impact of the various anaesthetic drugs on the medulla oblongata's vomiting control centre or due to a drop in intra operative blood pressure. The vomiting centre in the brain stem is made up of the reticular formation and nucleus tractus solitarius. The GI tract, cerebral cortex and thalamus, the vestibule cochlear area, and the CTZ are the 4 key zones that might directly or indirectly irritate these regions.

Complications include airway obstruction, aspiration pneumonia, and surgical wound opening can result from postoperative nausea and vomiting.[6,7] Dehydration, abnormal electrolytes, hypertension, suture straining, increased bleeding from skin flaps, and delayed discharge are all effects of postoperative vomiting. In the event that the airway reflexes are weakened as a result of the after effects of the anaesthetic medication, this complication can increase the risk of pulmonary aspiration.[8]

When prophylaxis is not used, ENT operations have a significant incidence of postoperative emesis.[9,10] The incidence of nausea or vomiting can make patients who are having ENT procedures unwell and postpone their discharge. Antiemetic use as a preventative measure may lower total PONV-related resource use and expenses, improving patient satisfaction.[11] Numerous methods have been employed to reduce the incidence of PONV, including as utilising one or more medications for prophylaxis, altering the anaesthetic technique, or combining them all for optimum protection.[12]

ISSN: 2515-8260, Volume 10, Issue 01, 2023

Dopamine and serotonin receptor antagonists, corticosteroids, antihistamines, sedatives, and anticholinergics are only a few of the medications that have been used to treat this condition thus far. The aforementioned medications have been replaced in modern times by novel therapies which can be used either alone or in conjunction with conventional therapies.[13,14,15]

Dexamethasone, a corticosteroid, is an efficient antiemetic for PONV prophylaxis in a variety of surgical procedures and hence improve surgical results.[16,17] Another novel complete intravenous anaesthetic with antiemetic characteristics when administered in subhypnotic doses is propofol, an antagonist at the 5-HT_3 receptor.[18,19] However, it's mechanism of action as an antiemetic is not known. According to a theory, it may have antiemetic effects via due to its antagonistic action on 5-HT_3 receptor [20] With no apparent side effects, low-dose intravenous propofol (0.5 mg/kg) can effectively prevent PONV. The modification of subcortical circuits to prevent nausea or its direct depressive influence on vomiting are thought to be the causes of propofol's antiemetic effects.

With this background, the present study was conducted with the aim to compare the effectiveness of propofol and dexamethasone for preventing postoperative nausea and vomiting after ear, nose and throat surgery and to study any adverse effects associated with these drugs.

METHODOLOGY

A comparative, randomized double blind study was conducted after approval of institutional ethical committee. The study was conducted in the department of anesthesiology and critical care of Dr. D.Y. Patil Medical College, hospital and research Centre, Pimpri, Pune, India. The study was conducted for 6 months. We calculated sample size using 22.5% PONV in propofol group and nil in dexamethasone group based on previous study. The calculated sample size was 30 in each group at 5% significance level and 80% power. Sixty patients of age of more than 18 years during the study period with ASA I and II posted for ear, nose and throat surgery under general anaesthesia and are hemodynamically stable are included in the study. Patients with previous history of nausea or vomiting, GERD and known allergy to study drugs were excluded. We also excluded patients who were obese. Preanesthetic evaluation and counselling for surgery was done the day before surgery and reviewed on the day of surgery. A detailed medical history was taken and systemic examination carried out and relevant investigations were advised to optimise them prior to surgery, patients were nil by mouth for 6-8hrs prior to surgery. All included patients were divided into 2 groups of 30 patients each: Group A and Group B.

Group A: Patients will be given IV Dexamethasone 8mg

Group B: Patients will be given IV Propofol 0.5mg/kg

The patients were allotted to a respective group by computer generated lottery method.

On arrival in pre-operative room, monitors were attached and baseline heart rate, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure, respiratory rate, oxygen saturation were recorded. Premedication was given with Inj. Glycopyrolate 0.004mg/kg IV and Inj. Fentanyl 1-2mcg/kg IV. All the patients were preoxygenated for 3minutes with 100% oxygen. Induction was done with Inj. propofol 2mg/kg, patient ventilated, then Inj.

ISSN: 2515-8260, Volume 10, Issue 01, 2023

succinylcholine depolarizing muscle relaxant 2mg/kg was administered to facilitate laryngoscopy and intubation. Intubation was performed with appropriate size endotracheal tube. Minute ventilation and respiratory rate was adjusted in such a way to keep ETCO2 between 35-40 mmHg.

Intraoperatively, parameters continuously monitored were heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), electrocardiogram (ECG), pulse oximeter (SPO2), and ETCO2. Anaesthesia was maintained with N_2O 60%, oxygen 40% and isoflurane 0.6–1% with vecuronium 0.1mg/kg as a non depolarising muscle relaxant.

After completion of surgery, Group A patients received a single dose of intravenous (IV) 8 mg dexamethasone, while Group B patients were administered with subhypnotic dose of propofol (0.5 mg/kg, IV). The drug preparation was done by an anesthesiologist who was not be involved in administration of anaesthesia. The monitoring and data collection were done by another doctor who was not involved in drug administration.

Neuromuscular block was reversed with appropriate doses of injection neostigmine (0.05mg/kg) and injection glycopyrolate (0.008mg/kg) and patient was extubated.

The incidence and severity of PONV and associated adverse effects were documented at different intervals like immediate post-op, at 30 mins, 1st hour, 6th hour, 12th hour, and 24th hour after the administration of dexamethasone and propofol. In addition, the requirement of rescue antiemetics in the overall 24 hours was documented. Patients were asked to report the severity and occurrence of nausea or vomiting on the 3-point score table, once fully able to respond to verbal commands. Patients were fully aware to classify PONV severity as no for score 0, mild nausea for 1, severe nausea but no vomiting for 2, and vomiting for 3 (Figure 1).

Figure 1: 3-point score table for PONV

The data recorded was analysed using the Statistical Package for Social Sciences (SPSS), 21 version. The associations were evaluated with the use of Student's t-test for quantitative variables and $\chi 2$ tests for categorical variables. The level of significance was set at 5% for all significance tests.

RESULTS

The majority of patients were ASA I (82.5%) and females (51.25%). There was no statistically significant difference between the dexamethasone and propofol groups in terms of

age, gender, body mass index (BMI), type of surgery, ASA status(Table 1).

Table 1: Demographic and operative parameters of study groups

PONV	Group A	Group B	p-value
Mean age (SD)	33.6±6.2	31.7±5.3	0.207
Gender (Female/male) [n%]	16/14 [53.3%,46.7%]	19/11 [63.3%,36.7%]	0.62
ASA (I/II) [n%]	26/4 [86.7%,13.3%]	23/7 [76.7%,23.3%]	0.317
Mean BMI (SD)	20.7 ±1.1	20.9±1.5	0.56
Type of surgery **a) Ear** **b) Nasal** **c) Throat**	 15 (50%) 6 (20%) 9 (30%)	 14 (46.7%) 3 (10%) 13 (43.3%)	0.414

Incidence of severe PONV was statistically lower in dexamethasone (3.3%) compared to that of propofol at both 6th hour (p= 0.023) and 12th hour (p=0.008) (Table 2).

Table 2: Incidence of PONV in study groups

Time	Scale of PONV	Group A	Group B	p-value
Within 1st hour	0	27 (90%)	24 (80%)	0.58
	1	1 (3.3%)	4 (13.4%)	
	2	1 (3.3%)	1 (3.3%)	
	3	1 (3.3%)	1 (3.3%)	
6th hour	0	26 (86.7%)	15 (50%)	**0.023**
	1	2 (6.7%)	8 (26.7%)	
	2	1 (3.3%)	5 (16.7%)	
	3	1 (3.3%)	2 (6.7%)	
12th hour	0	24 (80%)	11 (36.7%)	**0.008**
	1	3 (10%)	10 (33.3%)	

	2	2 (6.7%)	6 (20%)	
	3	1 (3.3%)	3 (10%)	
24th hour	0	26 (86.7%)	25 (83.3%)	0.95
	1	2 (6.7%)	2 (6.7%)	
	2	1 (3.3%)	1 (3.3%)	
	3	1 (3.3%)	2 (6.7%)	

The mean time to first nausea episode in group A was significantly more compared to group B (p<0.001) (Table 3)

Table 3: Time to first nausea episode in study groups

Study Groups	**Mean time to first nausea episode**	**Standard deviation**	**p-value**
Group A	4.25 hours	1.24 hours	**<0.001**
Group B	2.31 hours	2.28 hours	

Table 4 shows that there was no difference in requirement of rescue antiemetic in study groups.(p>0.05)

Table 4: Rescue antiemetic in study groups

Rescue antiemetic	**Group A**	**Group B**	**p-value**
< 6 hours	2 (6.7%)	3 (10%)	0.64
6 to 12 hours	1 (3.3%)	3 (10%)	0.30
12 to 24 hours	1 (3.3%)	2 (6.7%)	0.55

Table 5 shows the incidence of side-effects in study groups. There was no difference in incidence of side-effects in study groups (p>0.05)

Table 5: Side-effects in study groups

ISSN: 2515-8260, Volume 10, Issue 01, 2023

Side effects	Group A	Group B	p-value
Headache	1 (3.3%)	0	0.55
Dizziness	2 (6.7%)	1 (3.3%)	0.554
Hypotension	0	2 (6.7%)	0.3

DISCUSSION

ENT surgery has been associated with high incidence of PONV, especially in patients without prophylactic antiemetic agents.[22,23,24] Therefore, PONV is the anaesthetic complication of greatest concern for patients and continues to be a significant concern for anaesthesiologists.[15] Several strategies have been described for preventing PONV following middle ear surgery. [24-27] During any surgical procedure, serotonin is released from the gastrointestinal tract from enterochromaffin cells and binds to visceral receptors of the 5-HT 3 subtype, causing stimulation of vagal afferents in the gastrointestinal tract to conduct impulses that reach the Chemoreceptor Trigger Zone (CTZ) located on the dorsal surface of the medulla oblongata at the caudal end of the fourth ventricle and this arrived CTZ stimulus eventually leads to PONV.[28]

The requirement for rescue antiemetics was relatively lower in dexamethasone group. Glucocorticoids have been widely used to prevent PONV during chemotherapy use or general anaesthesia. Although the antiemetic mechanism is not clearly understood, scientific evidence suggests that dexamethasone reduces production and release of 5-HT and decreases permeability across the Blood Brain Barrier (BBB) thereby lowering the amount of 5-HT available to chemical sensors.[16,33] However, the use of dexamethasone may be associated with increased risk of infection, reduced wound healing, and interference with the functioning of adrenal glands through negative feedback-mediated reduction of endogenous steroid synthesis.

In our study, the overall incidence of PONV was higher in the propofol group than dexamethasone group with statistical significance at 6th and 12th hour period.(P=0.023 and P=0.008)

Fujii et al.[24] reported incidence rates of PONV following middle ear surgery as the incidence of patients who were emesis free during the 0- to 3-hour period after receiving anaesthesia was 93% for those who received propofol, 73% for those who received droperidol, and 70% for those who received metoclopramide, respectively; the respective corresponding incidence during the 3- to 24-hour period after receiving anesthesia was 90%, 67%, and 60% (P< 0.05).

In a similar study conducted by Özgür Özmen et.al.[29] dexamethasone group received 8mg, observed that 56.7% showed no incidence of postoperative nausea and vomiting between 0-2hrs post induction compared to 26.7% in control group. Total incidence rates of postoperative nausea and vomiting at hours 2-8 h were 36.7% in dexamethasone group and 53.3% in control group. At 0-24. hrs, the number of patients vomiting, despite treatment, were lower in dexamethasone group (16.7%,) compared to control group (46.7%).

Çelik et al.[30] administered 8 mg IV dexamethasone prior to induction of anaesthesia, infused subhypnotic dose of propofol (1mg/kg/h) during operation and control group were given infusion of 10% intralipid in patients undergoing laparoscopic cholecystectomy and came to the conclusion that incidence of PONV within the first 0-24h postoperatively was 72.5% in the control group compared to 37.5% in the dexamethasone group. The authors concluded that this was as effective as low-dose propofol infusion as the incidence was 40%.

Makhdoom et al. [26] administered 8 mg dexamethasone before induction of anaesthesia in middle ear surgery and reported an incidence of PONV as 35%, compared to 70% in the control group.

Erdem AF et al. [31] combined dexamethasone with IV propofol infusion at a rate of 20 μg/kg/min was administered in tonsillectomy surgery. And concluded that combination provided greater effectiveness against PONV compared to dexamethasone alone.

Fujii et al.[24] administered droperidol and metoclopramide with a low dose of propofol (0.5 mg/ kg IV) at the end of surgery in order to prevent PONV in adult patients undergoing middle ear surgery, and concluded that propofol was more effective.

Another study conducted by Jong Ho Ahn et al [25]; used 10 mg dexamethasone toward the end of mastoidectomy procedures exhibited a significant decrease in the incidence of dizziness and nausea when compared to the placebo group within the first 24 h postoperatively.

Abele Tilahun Bantie et al. [34] used 10mg dexamethasone 10mg and propofol 0.5mg/kg, IV and incidences of PONV throughout the 24-hour postoperative period were 35% in the propofol group and 25% in the dexamethasone group and concluded that dexamethasone was more effective to prevent PONV with lower requirements of rescue antiemetics.

Makhdoom et al [26], Erdem et al [31], Nonaka et al [32] have reported that propofol and dexamethasone are more effective in preventing PONV in combination with each other or with other agents.

The results of our study are consistent with other studies, conducted in different settings, in terms of antiemetic rescue therapy requirements and trends of dexamethasone preventive effect.[29-33,35,36]

CONCLUSION

The efficacy of dexamethasone and propofol in preventing post-operative nausea and vomiting in ENT surgeries is comparable even though dexamethasone produced better PONV protection than propofol in all time intervals.

REFERENCES

1. Apfel C. et al. A simplified risk score for predicting postoperative nausea and vomiting: conclusions from cross-validations between two centers. Anesthesiology, 1999. 91: p. 693–700.
2. GanTJ. Risk factors for postoperative nausea and vomiting. Anesth Analg. 2006; 102: 1884-1898

3. C. Apfel, P. Kranke, and L. Eberhart, "Comparison of surgical site and patient's history with a simplified risk score for the prediction of postoperative nausea and vomiting," Anaes- thesia, vol. 59, no. 11, pp. 1078–1082, 2011.
4. X. Cao, P. F. White, and H. Ma, "An update on the man- agement of postoperative nausea and vomiting," Journal of Anesthesia, vol. 31, no. 4, pp. 617–626, 2017.
5. S. I. Shaikh, D. Nagarekha, G. Hegade, and M. Marutheesh, "Postoperative nausea and vomiting: a simple yet complex problem," Anesthesia, Essays and Researches, vol. 10, no. 3, p. 388, 2016.
6. Schumann R. and D.M. Polaner, Massive subcutaneous emphysema and sudden airway compromise after postoperative vomiting. Anesth Analg, 1999. 89(3): p. 796–7.
7. Bremner W.G. and C.M. Kumar, Delayed surgical emphysema, pneumomediastinum and bilateral pneumothoraces after postoperative vomiting. Br J Anaesth, 1993. 71(2): p. 296–7.
8. McCracken G., P. Houston and G. Lefebvre Guideline for the Management of Postoperative Nausea and Vomiting. July Jogc Juillet 2008(209).
9. Honkavaara P (1996) Effect of ondansetron on nausea and vomiting after middle ear surgery during general anesthesia.Br J Anaesth 76:316–318
10. Ewalenko P, Janny S, Dejonckheere M, Andry G, Wyns C (1996) Antiemetic effect of sub hypnotic doses of propofol after thyroidectomy. Br J Anaesth 77:463–467
11. Sanchez-Ledesma MJ, López-Olaondo L, Pueyo FJ, Carrascosa F et al. A comparison of three antiemetic combinations for the prevention of postoperative nausea and vomiting. Anesth Analg. 2002; 95: 1590–5.
12. Bel Marcoval I, Gambus Cerrillo P et al. Risk assessment, prophylaxis and treatment for postoperative nausea and vomiting. Rev Esp Anestesiol Reanim. 2006; 53: 301-11.
13. Balki M. and J.C. Carvalho, Intraoperative nausea and vomiting during cesarean section under regional anesthesia. Int J Obstet Anesth, 2005. 14(3): p. 230–41.
14. Mishriky B.M. and A.S. Habib, Metoclopramide for nausea and vomiting prophylaxis during and after Caesarean delivery: a systematic review and meta-analysis. Br J Anaesth, 2012. 108(3): p. 374–83.
15. Griffiths J.D. et al., Interventions for preventing nausea and vomiting in women undergoing regional anaesthesia for caesarean section. Cochrane Database Syst Rev, 2012. 9: p. CD007579.
16. J.-J. Wang, S.-T. Ho, S.-C. Lee, Y.-C. Liu, and C.-M. Ho, "The use of dexamethasone for preventing postoperative nausea and vomiting in females undergoing thyroidectomy: a dose- ranging study," Anesthesia & Analgesia, vol. 91, no. 6, pp. 1404–1407, 2000.
17. Dreams Trial Collaborators and West Midlands Research Collaborative, "Dexamethasone versus standard treatment for postoperative nausea and vomiting in gastrointestinal surgery: randomised controlled trial (DREAMS Trial)," BMJ, vol. 18, p. 357, 2017.

18. H. Matsuura, S. Inoue, and M. Kawaguchi, "The risk of postoperative nausea and vomiting between surgical patients received propofol and sevoflurane anesthesia: a matched study," Acta Anaesthesiologica Taiwanica, vol. 54, no. 4, pp. 114–120, 2016.
19. D. Song, C. W. Whitten, P. F. White, S. Y. Yu, and E. Zarate, "Antiemetic activity of propofol after sevoflurane and desflurane anesthesia for outpatient laparoscopic cholecystec- tomy," Anesthesiology, vol. 89, no. 4, pp. 838–843, 1998.
20. Borgeat A, Wilder-Smith OH, Saiah M, Rifat K. Subhypnotic doses of propofol possess direct antiemetic properties. Anesth Analg 1992;74(4):539e41.
21. C. L. Burlacu, D. Healy, D. J. Buggy, C. Twomey, D. Veerasingam, and A. Tierney, "Continuous gastric decompression for postoperative nausea and vomiting after coronary revascularization surgery," Anesthesia & Analgesia, vol. 100, no. 2, pp. 321–326, 2000.
22. C. C. Apfel, E. L¨a¨ar¨a, M. Koivuranta, C.-A. Greim, and N. Roewer, "A simplified risk score for predicting postoperative nausea and vomiting," Anesthesiology, vol. 91, no. 3, p. 693, 1999.
23. M. Celik, A. Dostbil, M. Aksoy, I. Ince, A. Ahiskalioglu, and M. Comez, "Is infusion of subhypnotic propofol as effective as Anesthesiology Research and Practice 5 dexamethasone in prevention of post operative nausea and vomiting related to laparoscopic cholecystectomy? A randomized controlled trial," BioMed Research International, vol. 2015, 2015.
24. Fujii Y, Tanaka H, Kobayashi N. Prevention of postoperative nausea and vomiting with antiemetics in patients undergoing middle ear surgery: comparison of a small dose of propofol with droperidol or metoclopramide. Arch Otolaryngol Head Neck Surg 2001;127:25-8.
25. Ahn JH, Kim MR, Kim KH. Effect of i.v. dexamethasone on postoperative dizziness, nausea and pain during canal wall-up mastoidectomy. Acta Otolaryngol 2005;125:1176-79.
26. Makhdoom NK, Farid MF. Prophylactic antiemetic effects of midazolam, dexamethasone, and its combination after middle ear surgery. Saudi Med J 2009;30:504-8.
27. Arslan M, Demir ME. Prevention of postoperative nausea and vomiting with a small dose of propofol combined with dexamethasone 4 mg or dexamethasone 8 mg in patients undergoing middle ear surgery: a prospective, randomized, double-blind study. Bratisl Lek Listy 2011;112:332-6.
28. T. J. Gan, "Mechanisms underlying postoperative nausea and vomiting and neurotransmitter receptor antagonist-based pharmacotherapy," CNS Drugs, vol. 21, no. 10, pp. 813–833, 2007.
29. O. ¨ OzmeN, F. B˙Ing ¨ Ol, Z. ARslAn, and B. ¨ O. B˙Ing ¨ Ol, "The effects of dexamethasone vs low doses of propofol infusion on postoperative nausea and vomiting in tympanoplasty surgery: a randomized, placebo-controlled, double-blinded study," Medeniyet Medical Journal, vol. 32, no. 2, pp. 85–90, 2017.

30. Celik M, Dostbil A, Aksoy M, et al. Is infusion of subhypnotic propofol as effective as dexamethasone in prevention of postoperative nausea and vomiting related to laparoscopic cholecystectomy? A randomized controlled trial. Biomed Res Int 2015;2015:349806.
31. Erdem AF, Yoruk O, Alıcı HA, et al. Subhypnotic propofol infusion plus dexamethasone is more effective than dexamethasone alone for the prevention of vomiting in children after tonsillectomy. Paediatr Anaesth 2008;18:878-83.
32. Nonaka A, Suzuki S, Tamaki F, et al. Prevention of postoperative nausea and vomiting by metoclopramide combined with dexamethasone in gynecological surgery. Masui 2008;57:978-982.
33. C. Zhou, Y. Zhu, Z. Liu, and L. Ruan, "5HT3 antagonists versus dexamethasone in the prevention of PONV in patients undergoing laparoscopic cholecystectomy: a meta-analysis of RCTs," BioMed Research International, vol. 2016, 2016
34. Tilahun Bantie A, Admasu W, Mulugeta S, Bacha AR, Getnet Demsie D. Effectiveness of propofol versus dexamethasone for prevention of postoperative nausea and vomiting in ear, nose, and throat surgery in Tikur Anbessa Specialized Hospital and yekatit 12th hospital, Addis Ababa, Ethiopia [Internet]. Anesthesiology research and practice. U.S. National Library of Medicine; 2020 [cited 2022Dec28]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7492878/ Last accessed on 28.12.2022
35. Arslan M, Demir ME. Prevention of postoperative nausea and vomiting with a small dose of propofol combined with dexamethasone 4 mg or dexamethasone 8 mg in patients undergoing middle ear surgery: a prospective, randomized, double-blind study. Bratislavske Lekarske Listy. 2011 ;112(6):332-336. PMID: 21692408.
36. Y. Fujii and M. Nakayama, "Retracted article: prevention of postoperative nausea and vomiting with a small dose of propofol alone and combined with dexamethasone in patients undergoing laparoscopic cholecystectomy: a prospective, randomized, double-blind study," Surgical Endoscopy, vol. 22, no. 5, pp. 1268–1271, 2008.