Research Article

Dexamethasone versus ondansetron on post operative nausea and vomiting in caesarean section.

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Abstract
Introduction: Intraoperative nausea and vomiting (IONV) and Post operative nausea and vomiting (PONV) one of the most distressing anaesthesia-related adverse effects. **Aim of the work:** The present study aims to evaluate the prophylactic effect of intravenous ondansetron and dexamethasone on decreasing the incidence of nausea and vomiting in parturients undergoing elective caesrean section under spinal anaesthesia. **Patients and methods:** After approval of the university ethical committee and obtaining informed consent from all patients. This prospective, double-blinded study was conducted in gynecology and obstetric department, El-Minia University Hospital during the period from October 2018 to October 2019, after obtaining approval from the ethical committee and verbal consent from the patients. A total of one hundred and fifty women in child bearing period (18-45 years) , with BMI of 23-27, height of 150-170 cm and ASA physical status II, who were candidate for elective caesarean, were enrolled in this prospective randomized study. patients were randomly allocated into three groups, 50 patients in each one. Each patient in this study received 5 min preoperatively one of the syringes which containing either: **Group A:** IV ondansetron 8 mg diluted in 5 ml normal saline. **Group B:** IV dexamethasone 8 mg diluted in 5 ml normal saline. **Group C:** 5 ml normal saline The following variables (SBP, DBP, MAP, HR, SpO_2) were recorded just before medications (baseline) and intraoperatively also nausea and vomiting was recorded. post operative nausea and vomiting were recorded up to 4 days . **Results:** Ondansetron and dexamethasone decrease incidence of Nauesa and vomiting. **Conclusion:** IV administration of 8 mg of ondansetron or 8 mg of dexamethasone 5 minutes before operation were effective in decreasing the incidence of Nauesa and vomiting.

Key Words: ondansetron, dexamethasone, caesarean, post dural puncture headache, nausea, vomiting.

Introduction
Caesarean operation has experienced a dramatic rise in developing countries over the last 30 years (Fattahi at al., 2015). Spinal anaesthesia is one of the most popular methods of anaesthesia for caesarean operation (Siddiqui et al., 2015) which is done through injection of a local anaesthetic into the subarachnoid space (Di Cianni et al., 2008). It has several advantages as it requires low dose of local anaesthetic, hence has a low risk of toxicity, easy to perform, rapid, effective and safe for caesrean section which makes it the prefrable technique for elective procedures (Riley et al., 1995). Despite these advantages, it has intraoperative complications as hypotension, nausea and vomiting and post operative complications including infection, backache and headache which has bad effects on the well-being of patients (Sachs and Smiley 2014) and analgesic action by inhibition of transmission in nociceptive C -fibers and neural discharge. Ondansetron is the most common used 5-HT3 antagonist, which is of great importance for prevention of nausea and vomiting after chemotherapy or surgery.

Aim of the work
The present study aims to evaluate the prophylactic effect of intravenous ondansetron and dexamethasone on decreasing the incidence of nausea and vomiting in parturients undergoing elective caesrean section under spinal anaesthesia.

Materials and methods
After approval of the university ethical committee and obtaining informed consent from all patients. This prospective, double-blinded study was conducted in gynecology and obstetric department, El-Minia University

Hospital during the period from October 2018 to October 2019, after obtaining approval from the ethical committee and verbal consent from the patients. A total of one hundred and fifty women in child bearing period (18-45 years), with BMI of 23-27, height of 150-170 cm and ASA physical status II, who were candidate for elective caesarean, were enrolled in this prospective randomized study. patients were randomly allocated into three groups, 50 patients in each one. Each patient in this study received 5 min preoperatively one of the syringes which containing either:

Group A: IV ondansetron 8 mg diluted in 5 ml normal saline.

Group B: IV dexamethasone 8 mg diluted in 5 ml normal saline.

Group C: 5 ml normal saline On arrival in the operating theatre, all the monitors were connected.

Heart rate, ECG, arterial oxygen saturation and non-invasive blood pressure monitoring were applied before induction of anesthesia using PCI monitor (model advisor USA). An intravenous access was achieved with 18G IV cannula. Patients were preloaded with 10 ml/kg of pre-warmed Ringer's solution. Baseline readings were recorded 5 min before intrathecal injection.

Under strict aseptic conditions and sterilization of the back With Povidone-iodine solution, intrathecal anaesthesia was administered with the patient in the sitting position using 25-gauge cutting spinal needle inserted into the L3-L4 or L4-L5 intervertebral spaces, by anaesthiologest. After free flow of clear CSF, drugs were administered intrathecally (2.6 ml of 0.5% hyperbaric bupivacaine).On turning the patient supine, a wedge was placed under the right hip and 4 L /min O2 was administered by nasal cannula for all patients. Surgery performed in all cases with Pfannenstiel incision. After delivery of the baby and umbilical cord clamping, 15-30 IU of oxytocin diluted in 1000 ml of 0.9% normal Saline and prophylactic antibiotics were administered intravenously.

The following variables (SBP, DBP, MAP, HR, SpO_2) were recorded just after spinal anaesthesia baseline values. Then, all of them were measured at 1 min. post-induction of anesthesia and at 5 min. intervals for the 1st 10 minutes and thereafter at 10 min. intervals until the completion of the surgery. Maternal side effects was recorded as Hypotension, bradycardia and respiratory depressiona fall in mean BP $\geq$ 20% of baseline value was considered as hypotension and was treated with fluid boluses and incremental doses of IV ephedrine. The pulse rate less than 60 bpm was considered as bradycardia and was treated with IV atropine. Respiratory depression (arterial oxygen saturation < 90% or respiratory rate < 9/min) was treated with oxygen support. Also Nausea and vomiting (N/V) were monitored during intraoperative and postoperative periods till the end of the 4th day after the operation.

Results

Basic characteristics

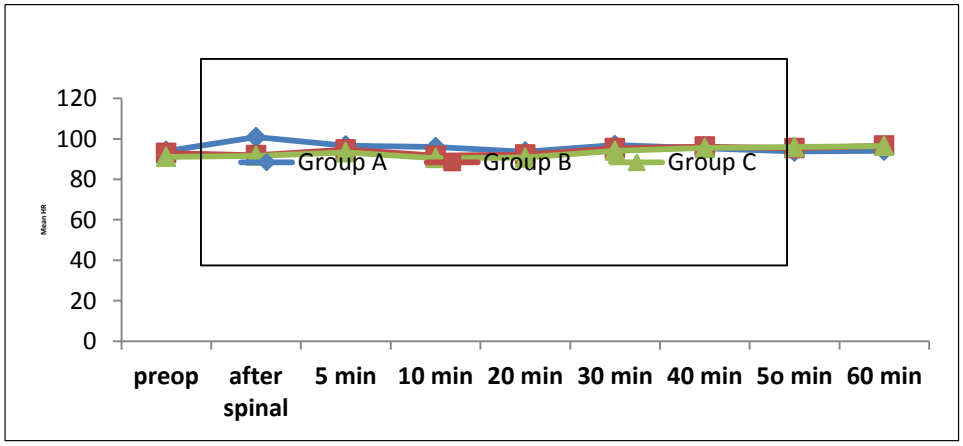
There were no significant differences (P > 0.05) between the groups regarding age, weight, height, BMI and number of attempts before successful spinal anaesthesia. Also, there was no significant difference in the quality of anaesthesia among groups. 43, 43 and 40 patients had excellent quality of anaesthesia in group A, B and C, respectively. While 7, 7 and 10 patients had good quality of anaesthesia in group A, B and C respectively **Hemodynamic data**

1- Heart rate:

The baseline heart rate in the three groups was 93.94±16.9, 93.04±10.1 and 91.10±5.5 in group A, B and C respectively. Heart rate was comparable between the three groups and there were no statistical differences between the groups at all-time intervals as shown in (Table 2) and (Figure 1).

(Table 2): Changes in the heart rate (beats/min) in the studied groups.
Data displayed as mean and standard deviation Analysis by ANOVA and posthoc test
p-value is considered significant at <0.05 .

Variable	Group A N=50	Group B N=50	Group C N=50	P-value
Preoperative	93.94±16.9	93.04±10.1	91.10±5.5	.474
1min. post-induction of anesthesia	100.82±19.7	91.92±11.5	91.58±7.9	.061
5 min	96.68±17.8	94.78±15.6	93.32±7.5	.504
10 min	95.92±17.2	91.66±15.1	90.52±8.6	.136
20 min	93.64±13.9	92.24±14.9	90.76±10.1	.550
30 min	96.90±16.2	95.36±16.1	94.10±10.9	.633
40 min	95.34±15.7	96.22±16.3	95.46±11.3	.948
5o min	93.76±12.6	95.36±16.5	95.92±12.9	.731
60 min	94.09±12.7	96.68±14.4	96.46±11.4	.560
At the end of surgery	99.36±0.66	99.28±0.73	99.36±0.74	.812



(Figure 1)

2. Mean Arterial blood Pressure (mmHg):
Table (3) and Figure (2): summarize the means ± SD changes of mean blood pressure in the studied groups. The differences between the three groups at all-time intervals were statistically insignificant.

Table (3): Changes in the MAP (mmHg) in the studied groups.

Variable	Group A N=50	Group B N=50	Group C N=50	P-value
Preop	85.32±10.9	87.96±11.8	90.08±14.0	0.753
1min. post-induction of anesthesia	77.06±10.3	78.32±11.0	80.90±16.1	0.542
5 min	77.10±11.3	76.92±13.8	78.24±12.2	0.509
10 min	93.76±8.4	93.48±13.6	96.56±14.2	0.644
20 min	82.94±10.1	82.04±14.6	83.44±13.8	0.342
30 min	82.70±11.3	82.82±17.0	91.06±16.6	0.112
40 min	73.52±12.1	75.44±13.1	79.10±19.2	0.232
5o min	71.90±11.7	72.38±10.9	73.30±14.5	0.643
60 min	73.72±10.3	72.14±10.7	71.74±12.7	0.234

Data displayed as mean and standard deviation Analysis by ANOVA and posthoc test p-value is considered significant at <0.05 .

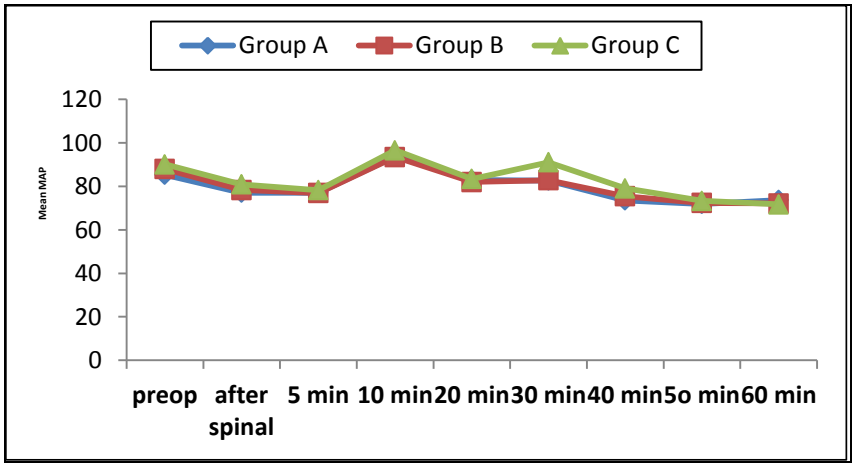


Figure (2)

3. Oxygen Saturation (SPO_2%):

Regarding oxygen saturation there was no significant difference between the groups as shown in (Table 4) and (Figure 3).

Table (4): Changes in oxygen saturation (SPO_2%) in the studied groups

Variable	Group A N=50	Group B N=50	Group C N=50	P-value
Preop	99.32±0.68	99.28±0.73	99.32±0.74	.950
after spinal	99.36±0.69	99.32±0.71	99.28±0.73	.854
5 min	99.40±0.67	99.32±0.71	99.28±0.73	.687
10 min	99.34±0.68	99.32±0.71	99.28±0.75	.914
20 min	99.34±0.68	99.32±0.71	99.28±0.75	.914
30 min	99.30±0.67	99.32±0.71	99.28±0.75	.962
40 min	99.34±0.68	99.32±0.71	99.28±0.75	.914
5o min	99.34±0.68	99.32±0.71	99.28±0.75	.914
60 min	99.36±0.66	99.28±0.73	99.36±0.74	.812

Data displayed as mean and standard deviation Analysis by ANOVA and posthoc test p-value is considered significant at <0.05.

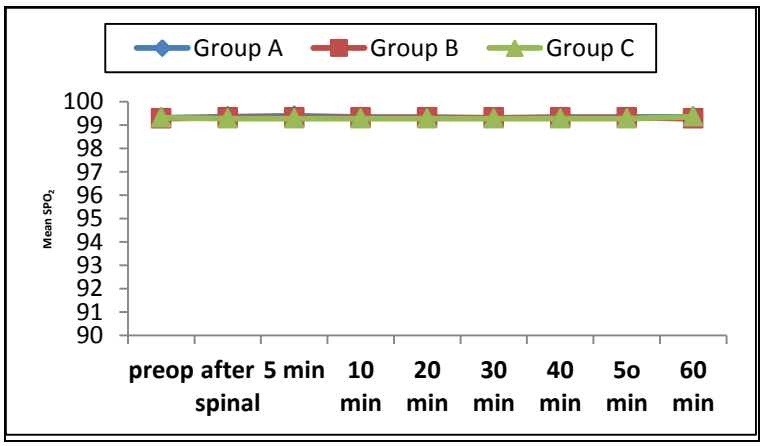


Figure (3)

The baseline heart rate in the three groups was 93.94±16.9, 93.04±10.1 and 91.10±5.5 in group A, B and C respectively. Heart rate was comparable between the three groups and there were no statistical differences between the groups at all-time intervals.

II) clinical data:

.Nausea and Vomiting :

Nausea and vomiting was assessed intra-operative and up to 4th day post-operative. It was scored according to nausea and vomiting score as the following:

0: no nausea or vomiting.
1: only nausea
2: nausea and vomiting
3: nausea and vomiting more than 2 times in 30 minutes.

Intra operative nausea and vomiting (IONV)

A.As shown in table (5), there was a significant reduction in the incidence of intra operative nausea and/or vomiting in ondansetron group (8%) when compared with dexamethasone group (16%) and control group (42%). In ondansetron group 46 cases had no nausea or vomiting, 3 cases had only nausea and 1 case had nausea and vomiting. Regarding dexamethasone group 42 cases had no nausea or vomiting, 4 cases had only nausea, 3 cases had nausea and vomiting and just 1 case of nausea and vomiting more than 2 times in 30 minutes. On the other hand 29 case of control group not developed nausea or vomiting, 5 cases had only nausea,10 cases had nausea and vomiting and 6 cases developed nausea and vomiting of score 3

Table (5) :Intaoperative nausea and vomiting (IONV) in the studied groups.

Variable	Group A	Group B	Group C	P-value			
	N=50	N=50	N=50	all	A,B	A,C	B,C
IONV:	4(8%)	8(16%)	21(42%)	0.001	0.220	<0.001	0.004
0 1 2 3	46(92%) 3(6%) 1(2%) 0(0%)	42(84%) 4(8%) 3(6%) 1(2%)	29(58%) 5(10%) 10(20%) 6(12%)	0.001	0.220	<0.001	0.004

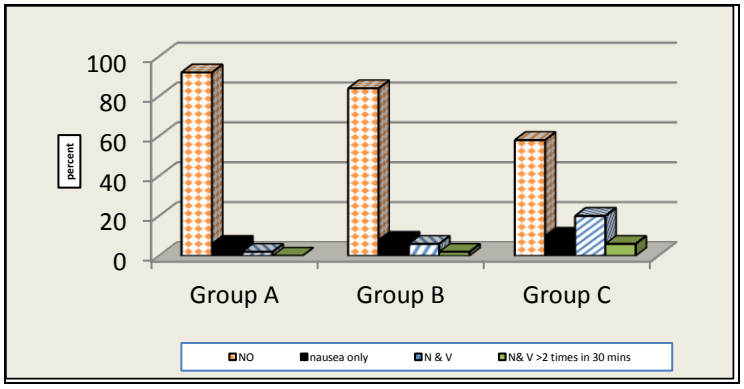


Figure (4): IONV

B. Postoperative nausea and vomiting (PONV)

PONV were assessed in the 1st 24h, 24-48h and up to 4th day. No PONV had occurred during the whole postoperative period in ondansetron group. While one case in the 1st 24h and 1 case during 24-48h had PONV in dexamethasone group. In control group, 4, 2 and 2 cases had PONV in the 1st 24h, 24-48h and 4th day respectively. There was significant difference between ondansetron group and control group in the 1st 24h and 24-48h.

Table (6) : Post operative nausea and vomiting in the studied groups.

Variable	Group A	Group B	Group C	P-value			
	N=50	N=50	N=50	all	A, B	A, C	B, C
PONV 1st 24 hours:							
0	50(100%)	49(98%)	46(92%)	0.039	0.317	0.042	0.170
1	0(0%)	0(0%)	0(0%)				
2	0(0%)	1(2%)	2(4%)				
3	0(0%)	0(0%)	2(4%)				
PONV 24-48 hours:							
0	50(100%	49(98%)	46(92%	0.040	1.000	0.042	0.170
1	0(0%)	0(0%)	0(0%)				
2	0(0%)	1(0%)	2(4%)				
3	0(0%)	0(0%)	2(4%)				
PONV 4 days							
0	50(100%)	50(100%)	48(96%)	0.987	1.000	0.155	0.155
1	0(0%)	0(0%)	0(0%)				
2	0(0%)	0(0%)	2(4%)				
3	0(0%)	0(0%)	0(0%)				

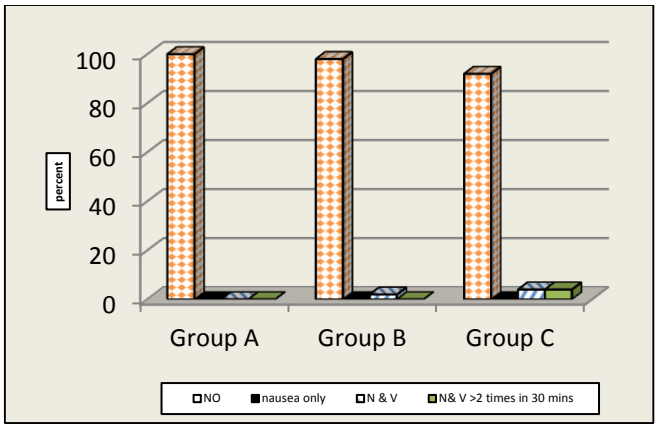


Figure (6): PONV in 1st 24 h

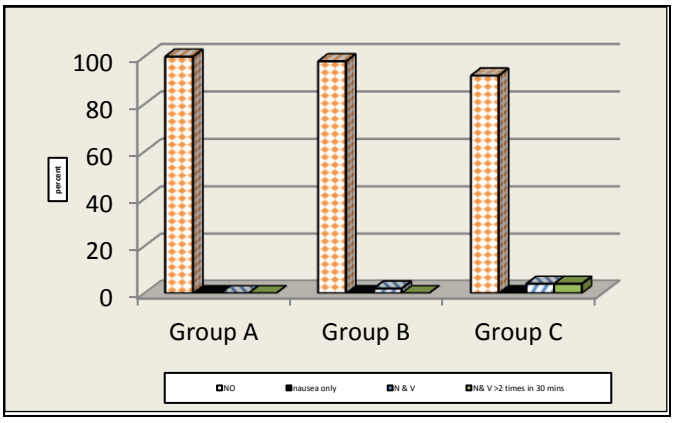


Figure (7): PONV in 24-48h

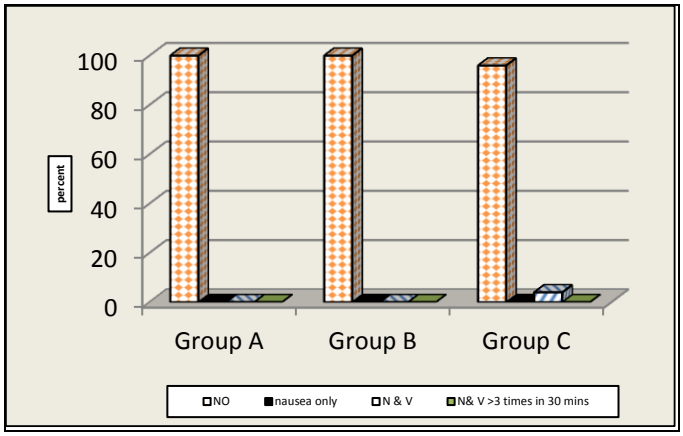


Figure (8): PONV from 48h up to the 4th day

Discussion

Spinal anaesthesia has numerous advantages such as elimination of the risks of general anesthesia, shortening the patient's hospitalization, and controlling.

postoperative pain **(**Golfam P. et al., 2016). This method is possible to be used in many kinds of surgeries. In common surgeries like caesarean, owing to reducing intubation, bleeding, and aspiration, it can decrease the mortality rate by 1/16 compared with general anaesthesia and is considered a less risky procedure.

Despite these advantages, spinal anaesthesia has side effects during anaesthesia include a fall in blood pressure, dyspnea, nausea and vomiting, and so forth.

The most common complications after or post anaesthesia consist of a neuro-toxic effect on the nervous system, infection of the central nervous system, headache, and backache. (Hamzei et al., 2012).

Intraoperative (INOV) and postoperative (PNOV) nausea and vomiting in cases that have undergone regional anaesthesia for cesarean section are very common (ranging from 7 to 80%) and have different overlapping etiologies, including hypotension, vagal hyperactivity, visceral pain, the use of intravenous opioids and uterotonic agents, and hormonal changes (Balki M and Carvalho JCA 2005).

Many studies have approved the efficacy of prophylactic dexamethasone and ondansetron in reducing nausea and vomiting along with the analgesic requirement in various types of operations.

In agreement with our results Yousefian et al., 2017 that aimed to explore the effects of Dexamethasone and Ondansetron Intravenous on Preventing headache , nausea and vomiting after spinal sedation of Patients Under a Caesarean Section anumber of 150 pregnant women who were candidates for caesarean surgery by regional anesthesia. They were divided into three groups of 50 Group A received placebo, group B 4 mg ondansetron, and group C 8 mg dexamethasone, then in each group was checked headache (up to 48 hours after surgery), nausea and vomiting (during and after surgery) and hypotension and bradycardia (during surgery). In the placebo group, after regional anesthesia, 18% had headache, 20% had nausea and vomiting during surgery, and 10% had nausea and vomiting after surgery, but in the two groups receiving ondansetron and dexamethasone there were no symptoms such as headache, nausea and vomiting, bradycardia and hypotension. These differences were statistically significant ($p < 0.05$). These consistent with our study on nausea and vomiting. While our study nausea and vomiting was followed for 4 days these gave us achance for discovering insignificant number of cases developed nausea and vomiting in the intervention groups and these makes our study more accurate.

The study by Fattahi et al., 2015 that evaluate the effect of ondansetron on PONV in women undergoing C/S, and they stated that ondansetron can reduce the incidence of PONV, while preventing the decrease in blood pressure. This is consistent with our study on nausea and vomiting. While our study compared two intervention groups (ondansetron and dexamethasone) which both improved N/V. In Fatthi et al., study only ondansetron was used. In the latter study ondansetron decreased incidence of hypotension, but no difference was found between both intervention and control group in our study and these may be due to using number of patients less than that in fatthi et al., study.

Althoguh our study confirmed the results of many previous studies, our results was against the results of many studies as in the study by Mojtaba Marashi et al., 2014 that investigated the effects of two different doses of ondansetron on spinal anesthesia-induced hypotension found that administration of two different doses of intravenous ondansetron, 6 mg and 12 mg, significantly attenuates spinal induced hypotension, bradycardia and shivering compared to the control saline group.

However, the hemodynamic profiles and shivering in two ondansetron groups were not statistically different the results was against our study a there was no significant

difference between the control group and intervention groups regarding heart rate and mean arterial blood pressure and these may be due to Mojtaba et al, was carried on different type of patients and with diferent concentrations of ondansetron our study only was on pregnant females. In the study by Yousefshahi et al., 2012 that evaluated the effect of 8mg dexamethasone on IONV after spinal anaethsia in caesrean Section and the results was that there was no significant difference between control group and dexamethasone group regarding incidence of IONV these against our study as in our study we found that dexamethasone decreased the incidence of IONV and these may be due to in Yousfshahi et al., the intravenous injection of dexamesthaone was after calmping umbilical cord but in our study it was administrated before spinal anaesthesia .

Recommendations

We recommend use of IV ondansetron or dexamethasone to decrease incidence o nausea and vomiting if it is not contraindicated as it simple, cheap and effective method to attenuaten nausea and vomiting. Our study performed in females undergoing elective caesarean section. Our finding cannot be extrapolated in genders, different types of surgery, patients with chronic diseases, so we encourage further studies involving these categories. Also, we recommend trying other adjuvant to improve the blunting of post operative nausea and vomiting.

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