RESEARCH ARTICLE

Comparing Ondansetron with Ondansetron-Dexamethasone Combination on Postoperative Nausea and Vomiting after Elective Abdominal Surgeries: A Randomized Double Blinded Clinical Trial

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Background: Postoperative nausea and vomiting (PONV) is an unpleasant and distressing complication after abdominal surgeries. We conducted a study to compare the efficacy of Ondansetron-Dexamethasone combination with ondansetron alone on PONV after abdominal surgeries under general anesthesia.
Methods: Two hundred patients undergoing elective abdominal surgeries under general anesthesia were allocated into two equal groups and anesthetised with the same technique. In one group combination of 8mg dexamethasone (2ml) and 4mg ondansetron (2ml) and in the other group ondansetron plus normal saline with the same volume was injected ten minutes before induction of anesthesia. PONV at recovery and during the first 24 hours after surgery were compared between the study groups.
Results: Twenty-two patients in ondansetron group and nine patients in ondansetron plus dexamethasone group had PONV respectively at first hour in recovery room (P=0.01). Eight patients in ondansetron group and no patient in ondansetron plus dexamethasone group had PONV at first 24 hours after surgery in the ward (P=0.007). In ondansetron group 21 patients and in combination group 7 patients needed intravenous metoclopramide as rescue medication for treatment of PONV in recovery (P=0.02). Two patients in ondansetron group needed intravenous rescue medication for treatment of PONV in the ward (P=0.01).
Conclusion: Dexamethasone plus ondansetron was more effective than ondansetron alone in preventing postoperative nausea and vomiting in patients undergoing elective abdominal surgeries.
Keywords: dexamethasone; elective surgeries; ondansetron; postoperative nausea and vomiting

Postoperative nausea and vomiting (PONV) is one of the most important causes of patients' discomfort [1]. Incidence of PONV after surgery is in the range of 20–30% and might reach to 75% in certain high risk patients [2]. Several patients' related risk factors such as female sex, history of PONV, and motion sickness have been identified as risk factors for PONV. Anaesthesia related factors such as use of opioid and nitrous oxide and duration of general anesthesia have been implicated as risk factors of PONV. It is one of the most unpleasant experiences associated with surgery and common reasons for poor patient satisfaction. Various antiemetic interventions, has been shown to improve patient satisfaction and reduce the time to recovery and discharge [3-11].

In this study our primary end point was to compare ondansetron-dexamethasone combination with ondansetron alone on PONV after elective abdominal surgeries under general anesthesia.

Methods

This randomized double blinded clinical trial was performed in Dr. Shariati Hospital of Tehran University of Medical Sciences from March to July of 2017. The study protocol conformed to the ethical guidelines of the 1989 Declaration of Helsinki. Ethical approval was provided by the Ethical Committee of Tehran University of Medical Sciences, Tehran, Islamic Republic of IRAN, protocol number 125 on 20 January 2017.

Two hundred patients aged 18-70 years of American Society of Anesthesiologists (ASA) physical status I-II scheduled for elective abdominal surgeries under general anesthesia were enrolled in the study. Patients who refused to be included in the study, pregnancy, BMI>35, addiction, patients with gastrointestinal disease, history of motion sickness, allergy to any of the study drugs, history of taking any antiemetic agent with 24 hours prior to surgery and smoker patients were excluded. All patients were instructed before the procedure and written informed consent was obtained individually before surgery. Randomization was done by computer generated codes and was concealed until interactions were assigned. Patients were fasted for a

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minimum of 6 hours prior to surgery. Selected patients were randomly allocated into two equal groups. Group A received dexamethasone 8 mg (2 ml) plus ondansetron 4 mg (2 ml) prepared in two different syringes, and group B received dexamethasone 8 mg (2 ml) and normal saline (2 ml) ten minutes before induction of anesthesia.

In operating room, routine monitoring was applied and baseline hemodynamic parameters were recorded. Patients were premedicated with 1mg midazolam and 2 µg/kg fentanyl intravenously. Anesthesia was induced with thiopental sodium 2.5 mg/kg and trachea was intubated with atracurium 0.5mg/kg and appropriate endotracheal tube size. A nasogastric tube was passed to promote baseline emptying of the stomach of air and gastric contents. Anesthesia was maintained with Isoflurane and 50% oxygen in nitrous oxide. Patient's demographic data, type of surgery and PONV during first 24 hours were all recorded and compared between the study groups. The rescue antiemetic (metoclopramide 10 mg) was given intravenously, if patient remained nauseous for more than 15 minutes, or experienced retching or vomiting.

Statistical analysis

A sample size or 100 patients in each group will be sufficient to detect 30% difference in the incidence of PONV between the study groups assuming power of 95% and a significant level of 0.05. Statistical analysis was performed with SPSS package version 19. Data were analyzed by independent sample t-test, Chi-square or fisher exact test when appropriate. P<0.05 was considered statistically significant.

Results

There were no significant statistical differences between the study groups regarding the demographic data and type of surgeries, (Table1-2).

Twenty two patients in ondansetron group and nine patients in ondansetron plus dexamethasone group had PONV respectively at recovery room (P=0.01, Figure 1).

Eight patients in ondansetron group and no patient in ondansetron plus dexamethasone group had PONV at first 24 hours after surgery in the ward (P=0.007, Figure 2).

Table 1- Comparing demographic data between the study groups.

Variable	Ondansetron (n=100)	Ondansetron + Dexamethasone (n=100)
Age(year)	38.4±12.6	36.2±11.8
Sex(M/F)	47/53	42/58
Weight(Kg)	67.8±15.5	70.1±10.8
Duration of surgery(Min)	120±66	118±73

P>0.05, Data are presented as mean±sd

Table 2- Comparing type of surgeries between the study groups.

Type of surgery	Ondansetron (n=100)	Ondansetron + Dexamethasone(n=100)	Total
Cholecystectomy	33	37	70
Hysterectomy	25	27	52
Ovarian Cyst	20	18	38
Abdominal Mass	22	18	40
	100	100	200

Data are presented as number

Figure 1- Comparing post-operative nausea and vomiting (PONV) at recovery, between the study groups.

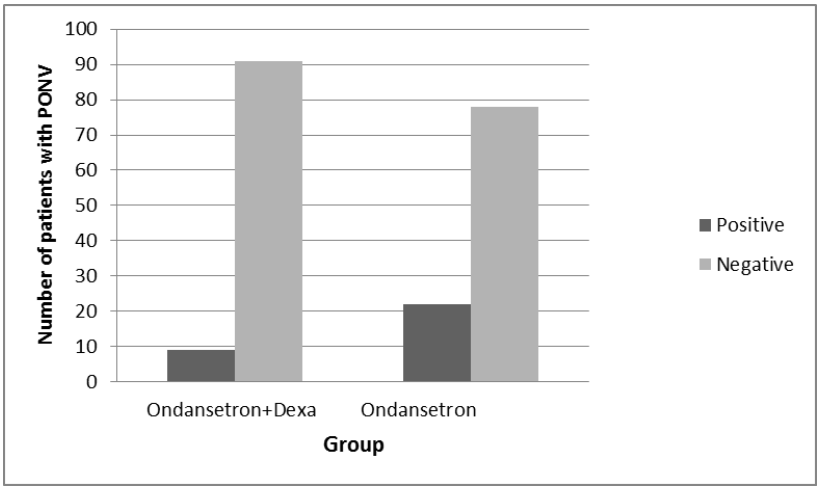
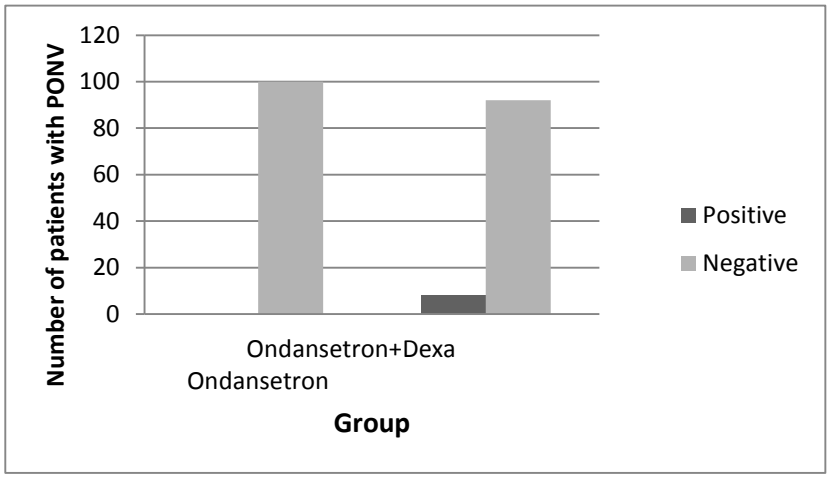


Figure 2- Comparing post-operative nausea and vomiting (PONV) at first 24 hours in ward between the study groups.



In ondansetron group 21 patients and in combination group 7 patients needed intravenous metoclopramide as rescue medication for treatment of PONV at recovery room (P=0.02). Two patients in ondansetron group needed intravenous rescue medication for treatment of PONV in the ward(P=0.01).

Discussion

This study showed administration of 8mg dexamethasone plus 4mg ondansetron intravenously was more effective than ondansetron alone in preventing postoperative nausea and vomiting in patients undergoing elective abdominal surgeries.

Among the drugs that are being used for PONV prophylaxis, 5HT3 antagonists, such as ondansetron, granisetron, palonosetron, and ramosetron, and dexamethasone are the two most commonly used nowadays. However, no drug has been found to provide complete PONV prophylaxis [12].

Dexamethasone was first reported as an antiemetic in patients receiving cancer chemotherapy in 1981.It has been effective in preventing PONV in patients undergoing tonsillectomy, thyroidectomy, abdominal hysterectomy and laparoscopic cholecystectomy. A wide range of doses of dexamethasone (8-32 mg) has been used among these, doses 8-10 mg has been used most frequently in the prevention of PONV [12-17].

In a study by Bano et al, one hundred of patients undergoing laparoscopic cholecystectomy were randomly allocated to two groups. One group received dexamethasone plus ondansetron and the other group received dexamethasone alone just before induction of anesthesia and found that in combined group PONV was statistically less than dexamethasone alone. Their result was similar to ours but type of surgery was different, we studied patients with abdominal surgeries instead of laparoscopic cholecystectomy and ondansetron instead of dexamethasone alone [15].

In another study by Gautam et al, hundred and fifty patients undergoing elective laparoscopic cholecystectomy done under general anesthesia were enrolled to receive one of three treatment regimens: 4 mg ondansetron (Group O), 8 mg dexamethasone (Group D) or 4 mg ondansetron plus 8 mg dexamethasone (Group OD) (n=50 for each). They found that combination of ondansetron and dexamethasone is better than each drug alone in preventing PONV after laparoscopic cholecystectomy. Their results were in accordance to ours ours although we had just two groups and did not include dexamethasone alone and also type of surgeries were different [16].

In a study by Biswas et al on 120 patients undergoing laparocopy, combination of granisetron-dexamethasone further increases the chance of complete response than granisetron alone on reducing of PONV that was similar to our study except the use of granisetron instead of ondansetron [17].

Conclusion

In conclusion intravenous administration of dexamethasone plus ondansetron is more effective than ondansetron alone in preventing postoperative nausea and vomiting in patients undergoing elective abdominal surgeries.

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