



Research Paper

Efficacy of Low Dose Propofol in Prevention of Nausea and Vomiting After Central Neuraxial Blockade

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ABSTRACT:

INTRODUCTION: Major gynaecological surgeries are associated with highest incidence of post-operative nausea and vomiting as high as 60-83%. Propofol is believed to be an antiemetic and therefore is useful to decrease incidence of postoperative nausea and vomiting when used in low dose.

MATERIALS AND METHODS:

60 ASA I,II patients undergoing abdominal/vaginal hysterectomy under central neuraxial block were randomly allocated to group P(propofol) and group C(control) of 30 patients each. At the end of surgery, on shifting the patient to recovery room, patients were given either study drug (inj. propofol 1% 1cc iv bolus) or control drug (inj normal saline 0.9% 1cc iv bolus) after taking baseline parameters. Patients were evaluated for complaints of nausea and vomiting for 15 min in recovery room for 1 hr and thereafter in postoperative ward till 24 hrs by a person who is blind to study.

OBSERVATIONS AND RESULTS: The incidence of patients experiencing nausea was 27.3% in grp P and 49.8% in grp C and vomiting 6% in grp P and 20.1% in grp C. No clinically adverse events caused by study drug were noticed.

CONCLUSION: We conclude that low dose propofol helps in preventing nausea and vomiting in remarkable manner with no side effects

Keywords: PONV-post operative nausea and vomiting ASA -American Society of anaesthesiologists

I. INTRODUCTION

Despite major advances in spinal epidural and combined spinal-epidural anaesthesia techniques, post operative nausea and vomiting are still present in significant number of patients

Although efforts have rightly been placed on providing adequate pain relief after surgery, many physicians continue to view post operative nausea and vomiting as a minor complication that possess a little problem to the patient. In contrast for many patients PONV(post operative nausea and vomiting) is more debilitating than surgery itself. The complication is not only unpleasant and displeasing to patients and their care givers but when severe, is associated with wound dehiscence, bleeding, electrolyte imbalance, dehydration and rarely pulmonary aspiration of gastric contents.^[1]

Major Gynaecological surgeries are associated with highest incidence of post operative nausea and vomiting as high as 60-83%.^[1]

In an attempt to decrease the incidence of nausea and vomiting in these patients, a number of antiemetics have been studied. But most of the currently used antiemetics (antihistamine, butyrophenones, dopamine receptor antagonists) have undesirable adverse effects, such as excessive sedation, hypotension, dry mouth, restlessness and extrapyramidal symptoms. Therefore the condition remains a challenge for anaesthesiologists.^[2]

Propofol is believed to be an antiemetic and therefore is useful to decrease the incidence of post operative nausea and vomiting when used in a low dose.^[3,4]

A prospective single blind randomized, controlled clinical investigation was designed to assess the effectiveness and safety of low dose propofol for prevention of postoperative nausea and vomiting. This will

certainly help in decreasing patient morbidity in the post operative period and speeding patients recovery in vaginal and abdominal hysterectomy patients under central neuraxial blockade.

II. MATERIAL AND METHODS

The present study was conducted in attached teaching hospital after approval by the ethical committee

Selection of Patients

Inclusion Criteria :

- Age 30-60 years.
- ASA I/II (American Society of anaesthesiologists)
- Elective vaginal or abdominal hysterectomy

Exclusion Criteria:

- Patient with contraindication for regional anaesthesia.
- Patient with history of drug allergy or sensitivity to drug used in the study.
- Patient who has systemic disorders like GI disorders, epilepsy, liver diseases, hyperlipidemia.
- Patients receiving emetogenic drugs.
- Patient with history of vomiting disorders.

III. METHODOLOGY OF STUDY

Study was carried out in 60 patients of ASA grade I / II in the age group of 30-60 years posted for elective vaginal or abdominal hysterectomy under central neuraxial blockade. Patients were randomly allocated in 2 groups of 30 patients each after detailed pre-anaesthetic evaluation for exclusion criteria.

Group P : Given injection propofol 1% 1cc IV bolus.

Group C : Given injection normal saline 0.9% 1cc IV bolus.

All patients were premedicated with injection ranitidine 50 mg and injection metaclopramide 10 mg IV 30 min prior to surgery. Then under all aseptic precautions appropriate epidural space was identified by loss of resistance technique and catheter was inserted and fixed at calculated distance from skin level. Epidural catheter was used for giving calculated epidural drug top up dosages during the surgery. Appropriate subarachnoid space was identified, with the help of 25G spinal needle and a calculated dose of spinal drug injected in subarachnoid space. Patients were monitored for vital parameters throughout the surgery. At the end of surgery, on shifting the patient to recovery room, patients were given either a study drug or control drug dose intravenously after taking baseline parameters.

Patients were then evaluated for haemodynamic derangements and complaints of episodes of nausea and vomiting for every 15 min in recovery room for 1 hour and thereafter in post operative ward upto 24hours by a person who is blinded to study.

Injection ondansetron 4 mg IV was given as a rescue antiemetic when score is more than or equal to 3 on post-operative nausea and vomiting scale. Haemodynamic derangements were treated appropriately if any. Patients were observed for any side effects like pain on injection, sedation, haemodynamic changes, thrombophlebitis, any other side effects.

Table 1: Nausea and vomiting rating scale

1	-	None
2	-	Mild nausea
3	-	Moderate vomiting 1-2/12 hrs with nausea
4	-	Sever vomiting > 3/12 hrs.

Injection ondansetron 4mg IV will be given as rescue antiemetic when the score is more than or equal to 3.

Appropriate statistical test were applied according to the requirement and a 'P' value of less than 0.05 was considered statistically significant.

IV. OBSERVATION AND RESULTS

Table 2: Characteristics of the patients from study and control group

Characteristics	Study Group (n=30)	Control Group (n=30)	p- value ^a
Age (years)	48.0±10.1	44.5±8.4	0.154 ^{NS}
Weight (kg)	55.8±7.3	56.2±7.8	0.853 ^{NS}
PR (per min)	75.6±5.9	75.8±6.2	0.866 ^{NS}
RR (per min)	12.3±1.5	11.9±1.1	0.249 ^{NS}
BP (mmhg)	100.9 ± 6.0	102.0 ± 5.7	0.482
Spo2 (%)	98.4±1.0	98.8±0.7	0.058 ^{NS}

Values are mean ± standard deviation of mean.
a: Independent sample t test is used to compare difference in mean values of Study and Control group.
NS: Statistically Not Significant p<0.05.

PR-pulse rate,RR-respiratory rate,BP-blood pressure

Table 2 shows both groups were comparable with regard to demographic data age, weight, PR, RR,BP, SpO2

Table 3: The distribution of average no. of nausea and vomiting episodes between two study groups.

No. of episodes of	Propofol Group (n=30) (Group P)	Control Group (n=30) (Group C)	P-value
Nausea	3.0 (0 – 5)	6.0 (0 – 8)	0.001
Vomiting	0.5 (0 – 2)	2.0 (0 – 4)	0.001

Values are Median (Min – Max). P-values by Mann-Whitney U test.

Graph 1 :- The distribution of patients according to number of reported nausea and vomiting episodes.

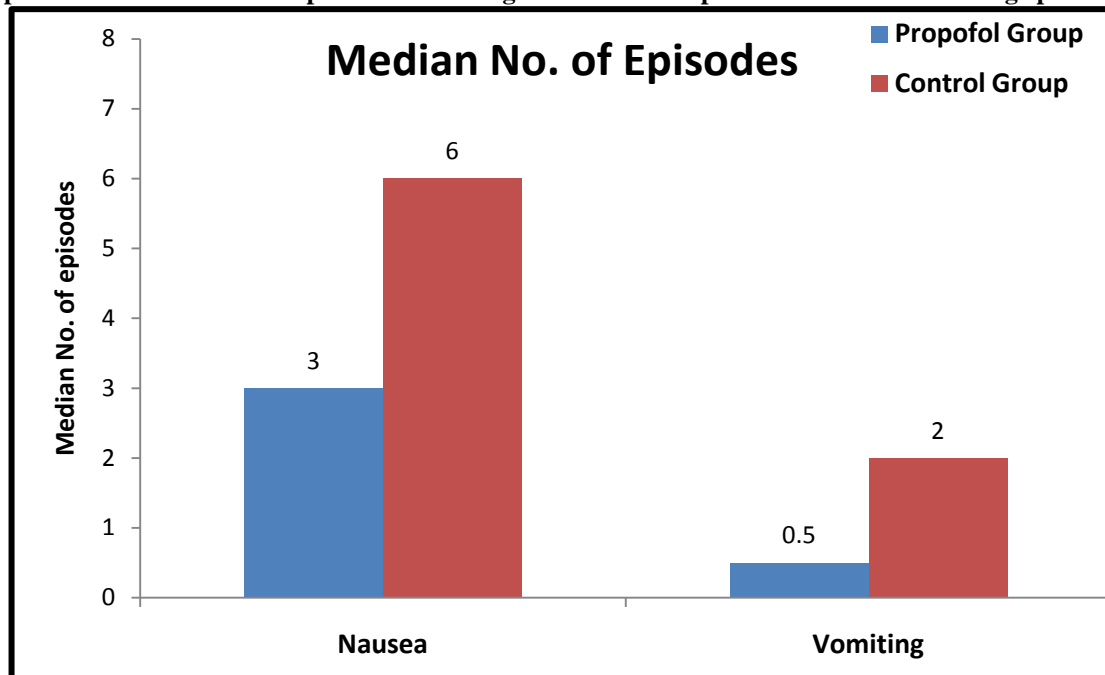
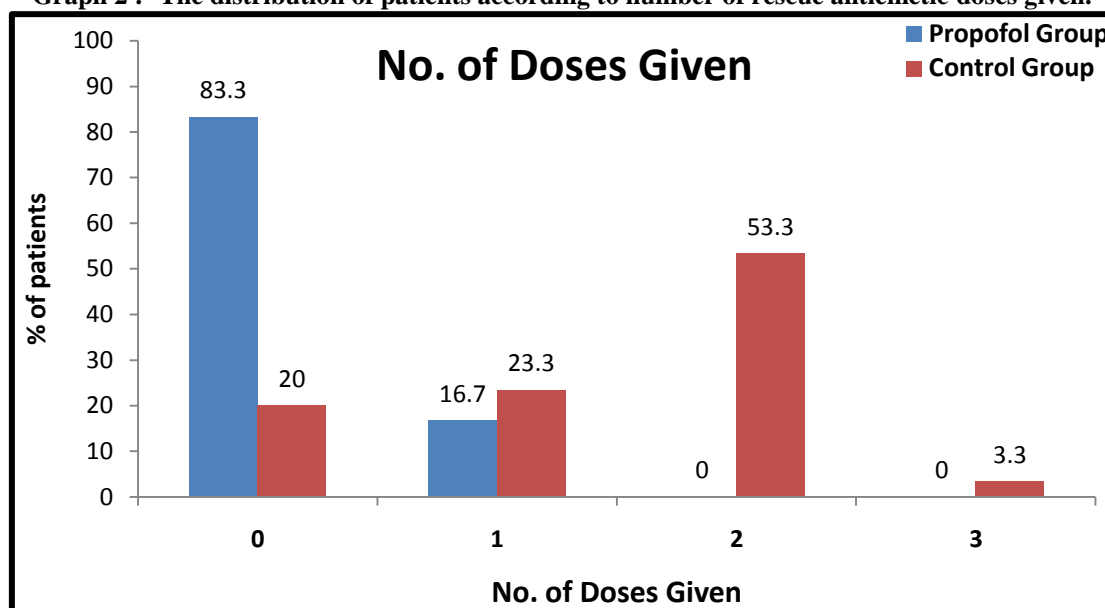


Table 4 :- The distribution of patients according to number of rescue antiemetic doses given.

No. of doses given	Propofol Group (n=30) (Group P)	Control Group (n=30) (Group C)	P-value
0	25 (83.3)	6 (20.0)	0.001
1	5 (16.7)	7 (23.3)	
2	0	16 (53.3)	
3	0	1 (3.3)	

Values are n (% of patients). P-value by Chi-square test.

Graph 2 :- The distribution of patients according to number of rescue antiemetic doses given.



RESULTS

- The average age, weight, pulse rate, respiratory rate, mean blood pressure, spo2 were similar in two groups.
- The average no. of nausea episodes is significantly higher in Control group compared to Propofol group.
- The average no. of vomiting episodes is significantly higher in Control group compared to Propofol group.
- The distribution of number of rescue antiemetic doses given differ significantly between two study groups. Significantly higher proportion of cases from Control group were given higher number of doses compared to the cases from Propofol group
- Side effects of study drug – Nil.

V. DISCUSSION

Major gynaecological surgeries are associated with highest incidence of PONV as high as 60-83% of patients receiving emetic sequelae.^[1]

The incidence of PONV in gynaecological procedures is a complex multifactorial problem. Stimulation of uterus, broad ligament, vagina and cervix causes vomiting through afferents to spinal cord along hypogastric and pelvic plexus. Also surgical pain increases the circulating catecholamines which causes PONV by stimulating area postrema.

Other non anaesthetic causes include surgical bleeding, medications, such as antibiotics and motion at the end of surgery, history of motion sickness. Few anaesthetic causes include hypotension, increased vagal activity, administration of neuraxial or parenteral opioids, addition of phenylephrine or epinephrine to local anaesthetics's, peak block height \geq T5, use of procaine, baseline heart rate \geq 60 beats /min.

Propofol is believed to be an antiemetic and therefore is useful to decrease the incidence of post operative nausea and vomiting when used at a subhypnotic dose.

Study conducted by Alain Borgeat et al^[7] was the first study to have investigated the direct antiemetic properties of propofol compared with placebo. His study strongly suggested that propofol was truly subhypnotic in dose administered (bolus 10 mg iv) in their study. Both groups in their study were well matched for factors like sex, duration, type of surgery, anesthetic technique known to affect the incidence and severity of nausea and vomiting. Their study implied that a dose of 10 mg of propofol proved effective without side effects in patients weighed between 50-80 kg. However larger doses of propofol for patients outside this weight range may be associated with undesirable side effects and exerting its antiemetic action by modulation of subcortical pathways. Thus finally concluding that propofol in subhypnotic doses possesses direct anti-emetic properties in context of minor elective surgery.

In studies conducted by Ramanathan et al^[1] concluded that subhypnotic doses of 20 mg IV bolus propofol eliminates post operative nausea and vomiting. Propofol given at the end of surgery as a bolus has been widely proclaimed as the Sandwich technique and this has been shown to reduce the PONV incidence. The clinical implication of the study is two manifold. Firstly, the efficacy of sub hypnotic dose of propofol in

reducing the PONV incidence was proved. Secondly, the antiemetic properties of propofol can be made use of in day care surgeries and in monitored anesthesia care where PONV can be distressing. It can also be used for surgeries which have increased PONV (gynaecological, adenotonsillectomies, laparoscopies etc) for induction and maintenance of anesthesia since propofol reduces PONV more than other inhalation and intravenous agents thus finally concluding that Propofol in subhypnotic doses possesses antiemetic properties.

In our study, demographic data between the two groups was comparable (**Table 2**) and the median number of episodes of nausea in group P were 3 and in group C were 6 with a significant P value and the median number of episodes of vomiting in group P were 0.5 and in group C were 2 with a significant P value (**Table no 3**, **Graph no1**).

Ramanathan et al revealed that the number of emetic episode and the need for rescue antiemetic therapy was also reduced in propofol group. Rescue antiemetics were given to 55% of patients in control group while none in the propofol group required the same.^[1]

Numazki Y Fuji and A. Rudra et al also had similar findings, as the above study.^[3,4]

In our study patients in propofol group required significantly less doses of rescue antiemetic in first 24 hrs post operative period. In propofol group 83.3% of patients required no dose and 16.7% of patients required 1 dose of rescue antiemetic, where as in control group 20% of patients required no dose, 23.3% required 1 dose, 53.3% required 2 doses, and finally 3.3% of patients required 3 doses. (**Table no.4, Graph no. 2**)

With this background, results obtained in propofol group appear to be excellent.

VI. CONCLUSION

Hence in our opinion subhypnotic doses of propofol should be regularly used as an antiemetic because of its properties like more efficacy and minimum adverse effects, thus decreasing patient morbidity in the post operative period and speeding patients recovery in vaginal and abdominal hysterectomy patients under central neuraxial blockade.

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