



A STUDY ON COMPARISON OF INTRAVENOUS LIGNOCAINE VERSUS GRANISETRON TO ALLEVIATE PAIN ON PROPOFOL INJECTION

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ABSTRACT

BACKGROUND: Induction agents are drugs that, when given intravenously in an appropriate dose, cause a rapid loss of consciousness. Propofol, 2,6-diisopropylphenol is most popular induction agent

with its favourable characteristics of rapid and smooth induction and recovery, decrease incidence of nausea and vomiting. **METHODS:** This is a double blind randomized controlled trial and patients were recruited after obtaining the consent. We included 100 subjects aged between 18-60 years, chosen for elective surgery under general anesthesia. These subjects were divided into Group I and Group II, comprising of 50 each. Patients of group I received 30mg lignocaine (3ml of 1% solution) IV and group II received 2mg (3ml) of granisetron IV and, over a period 5 seconds about 5 minutes after cannulation. **RESULTS:** A total of 100 cases were included in our study, who had been posted for the surgical procedures. The pain after propofol administration was absent in 72% and 64% patients of group I and group II respectively. Nearly 14% of the group I patients and 18% of group II patients had mild pain, while this percentage was 14% and 18% for moderate pain. None of the patients in both the groups had severe pain. **CONCLUSIONS:** The results of study, conclude that granisetron decreases the propofol induced pain as effectively as lignocaine and both the drugs did not differ in their effect on hemodynamic factors after the induction with propofol.

KEYWORDS : Propofol, Granisetron, Lignocaine, Intravenously, Induction agents

INTRODUCTION:

Induction agents are drugs that, when given intravenously in an appropriate dose, cause a rapid loss of consciousness. Induction agents are used to induce anaesthesia prior to other drugs being given to maintain anaesthesia, as the sole drug for short procedures, to maintain anaesthesia for longer procedures by intravenous infusion, to provide conscious sedation during procedures undergoing in local anaesthesia and intensive care unit. Propofol, 2,6-diisopropylphenol is most popular induction agent with its favourable characteristics of rapid and smooth induction and recovery, decrease incidence of nausea and vomiting, etc.^{1,2} While on other side decrease blood pressure, dose dependent depression of ventilation, pain on injection are the major drawbacks.^{3, 4, 5} Intravenous (IV) administration of Propofol causes intense burning pain which adds to patient's dissatisfaction. Incidence of pain on IV propofol administration into a vein on dorsal aspect of hand has wide distribution ranging from 28-90%. There were several formulations designed to lesser the pain or make it pain free, but they were futile.^{6,7} The pre-treatment with IV lignocaine has proven to be most effective in reducing the propofol induced pain nearly 60%. Recently, the newer pharmacological agents like 5HT₃ receptor antagonists have been tried, to prevent propofol induced pain, among them the Granisetron, a higher congener of ondansetron which longer period of action and has better antiemetic effect. The preliminary evidence also suggests that granisteron is effective in preventing pain on IV propofol administration.^{8,9}

OBJECTIVES OF THE STUDY:

The objective of the study is to compare the efficacy of IV lignocaine 1% (30mg in 3 ml) and IV granisetron (2mg in 3ml with) in alleviating pain on IV propofol administration.

MATERIALS AND METHODS:

Source Of Data And Study Design: This is a double blind randomized controlled trial and patients were recruited after obtaining the consent conducted at Dept. of Anaesthesia Noida International Institute of Medical Sciences Gautham Budh Nagar, Greater Noida, UP

Inclusion Criteria: We included 100 subjects aged between 18-60 years, chosen for elective surgery under general anesthesia belonging to American Society of Anesthesiologists (ASA) physical status grades I and II. These subjects were divided into Group I and Group II, comprising of 50 each.

Exclusion Criteria: Patients with history of allergy, having received any sedatives, analgesics within 48 hours before procedure, who were pregnant and lactating, having communication disability and undergoing emergency procedures were excluded from our study. Pre-anaesthetic evaluation was performed one day before surgery. In the operating room, 20 G cannula was secured on the dorsal surface of hand. Standard monitors were connected, pulse rate (PR), non-invasive blood pressure (BP), peripheral oxygen saturation (SpO₂) and respiratory rate (RR) were measured and recorded at 3 time intervals i.e., before administering propofol and after 1 and 3 minutes of propofol administration. Patients of group I received 30mg lignocaine (3ml of 1% solution) IV and group II received 2mg (3ml) of granisetron IV and, over a period 5 seconds about 5 minutes after cannulation. The tourniquet was released after 1 minute of premedication. Initially 20 mg bolus (2ml of 1% solution) propofol was administered over 4 seconds and 15 seconds later patient was asked to rate the pain due to propofol administration. Grading of pain was done using McCrirk and Hunter scale (Table 1), a standardized measure of pain after IV administration of propofol. Routine maintenance and monitoring of anaesthesia was done. At the end of surgery, reversal of muscle relaxation (neostigmine 0.05mg/kg & glycopyrrolate 10 mcg/kg, IV) was done and the patients were extubated. The PR, BP, SpO₂ & RR recordings before induction, at 1 & 3 min after induction were compared between Group I and II.

STATISTICAL ANALYSIS:

The results for continuous variables were presented as mean and standard deviation and mean difference between groups was compared using independent t test. The categorical variables between the groups were compared using Chi-Square test. Repeated measure analysis of variance (RM-ANOVA) was done to compare the PR, BP, SpO₂ & RR before

and after propofol induction between the groups. For all the tests probability (P) value ≤ 0.05 was considered as statistically significant.

Table 1: Mc Crirrick and Hunter Scale of Evaluation of Pain following IV PROPOFOL administration

Score	Description
0	None (negative response to questioning)
1	Mild pain (pain reported only in response to questioning without any behavioral signs)
2	Moderate pain (pain reported in response to questioning and accompanied by behavioral sign or pain reported simultaneously without questioning)
3	Severe pain (strong vocal response or response accompanied by facial grimacing, arm withdrawal or tears)

RESULTS AND DISCUSSION:

A total of 100 cases were included in our study, who had been posted for the surgical procedures. The mean age of the subjects in group I was 44.35.12 years and 42.34.23 years respectively. Out of 100 cases, 32 were males and 18 were females in group I and 34 were males and 16 were females in group II respectively. The pain after propofol administration was absent in 72% and 64% patients of group I and group II respectively. Nearly 14% of the group I patients and 18% of group II patients had mild pain, while this percentage was 14% and 18% for moderate pain. None of the patients in both the groups had severe pain. The group difference was calculated using chi-square test. The pain reduction between groups I and II was insignificant ($p = >0.05$). There was no statistically significant mean difference between the groups in PR, RR, BP and SpO₂ at baseline and on RM- ANOVA there was no significant group time interaction for these variables at the end of 1 and 3 minutes of propofol administration compared to the baseline except for RR.

DISCUSSION:

In our study, we found that granisetron is equally effective as lignocaine for the management of pain on IV propofol administration. On comparison of two groups in pain reduction as well as in hemodynamic stability and peripheral blood oxygenation measured with PR, BP and SpO₂ respectively was insignificant. Propofol is a fast-acting agent and its action wears off quickly making it useful for day care procedures. At sub hypnotic doses, it provides excellent sedation, amnesia, anxiolysis and a state of general well-being in addition to its advantageous antiemetic action. Another important finding in our study was the absence of significant group difference between lignocaine and granisetron for the prevention of pain on IV propofol administration. These findings are consistent with previous studies showing both lignocaine and granisetron being equally effective in preventing pain on IV propofol administration. Our study also affirms that the incidence of pain on IV propofol administration is much reduced in both the groups than patients who did not receive any pre-treatment.¹⁰⁻¹¹

CONCLUSION:

The results of study, conclude that granisetron decreases the propofol induced pain as effectively as lignocaine and both the drugs did not differ in their effect on hemodynamic factors after the induction with propofol. Granisetron has an added advantage of decreasing postoperative nausea and vomiting. Since, our sample size was less, we recommend that further research is needed with larger sample size to confirm the findings.

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