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Evaluation of Pain on Induction with Propofol in Patients Undergoing Minor Surgical Procedures: A Comparative Study

Rajul Subhash Karmakar, Shishir Ramachandra Sonkusale
Associate Professor, Department of Anaesthesia,
Dhanalakshmi Srinivasan Medical College & Hospital, Perambalur, Tamilnadu, India.

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***Correspondence to:**
Dr. Shishir R Sonkusale,
Associate Professor,
Dept. of Anaesthesia,
DS Medical College,
Tamilnadu, India.

ABSTRACT

Background: Propofol is becoming the intravenous anesthetic of choice for ambulatory surgery in outpatients. Hence; we planned the present study to assess the alterations occurring in patients undergoing induction of propofol anaesthesia.

Materials & Methods: The present study was conducted to assess the occurrence of pain on induction of anaesthesia with propofol. It evaluated a total of 30 subjects. Patients scheduled to undergo minor, elective surgery were included in the present study. Group A: included subjects who were given propofol 2.5 mg/kg, on the dorsum of hand, Group B: included subjects who were given propofo12.5 mg/kg; on forearm/antecubital fossa. We recorded any form of spontaneous remarks about feelings at the site of injection. All the results were recorded on Microsoft excel sheet and were analysed by SPSS software.

Results: Mean induction time for the subjects of the group A and group B was 69.2 seconds and 73.5 seconds respectively. We observed significant difference wile comparing the mean induction time among the subjects of the two study groups. 6 patients in the group A and 9 patients in the group B didn't had any form of alternation or sensation at the site of injection, respectively. Pain at the site of inaction was observed in 5 and 3 patients of group A and group B respectively.

Conclusion: Significantly less sensation and alterations at the injection site is seen when propofol is given in the forearm / antecubital fossa.

KEYWORDS: Anaesthesia, Pain, Propofol.

INTRODUCTION

A complex stress response is often associated with surgical procedures and administration of anesthesia which occur proportional to the intensity of injury, total operating time, amount of intraoperative blood loss and degree of postoperative pain.[1,2] The adverse metabolic and hemodynamic effects of this stress response can present many problems in the perioperative period. One of the key factors in improving outcome and lowering the length of hospital stay as well as the total costs of patients care, is by decreasing the stress response to surgery and trauma.[3-5] Propofol (2,6-diisopropylphenol) is becoming the intravenous anaesthetic of choice for ambulatory surgery in outpatients. It is extensively metabolized, with most of the administered dose appearing in the urine as glucuronide conjugates. Favourable operating conditions and rapid recovery are claimed as the main advantages in using propofol, whereas disadvantages include a relatively high incidence of apnea, and blood pressure reductions.[6,7] Hence; the present study was planned to assess the alterations occurring in patients undergoing induction of propofol anaesthesia.

MATERIALS & METHODS

The present study was conducted in Department of Anaesthesia, DS Medical College & Hospital, Perambalur, Tamilnadu (India) to assess the occurrence of pain on induction of anaesthesia with propofol. The study evaluated a total of 30 subjects. Patients scheduled to undergo minor, elective surgery were included in the present study. We didn't included subjects in the present study who presented with positive history of known drug allergy. We also excluded diabetic and hypertensive subjects from the present study. All the patients were broadly divided into two study groups with 15 subjects in each group;

Group A and group B as follows:

Group A: Included subjects who were given propofol 2.5 mg/kg, on the dorsum of hand,

Group B: Included subjects who were given propofo12.5 mg/kg; on forearm/antecubital fossa,

Detailed demographic and clinical details of all the subjects were obtained. We recorded any form of spontaneous remarks about feelings at the site of injection. Recording of the induction time was also done. Immediate postoperative inspection of the injection site was done for recording the changes, if present. All the results were recorded on Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for assessment of level of significance.

Graph 1: Demographic details of the subjects

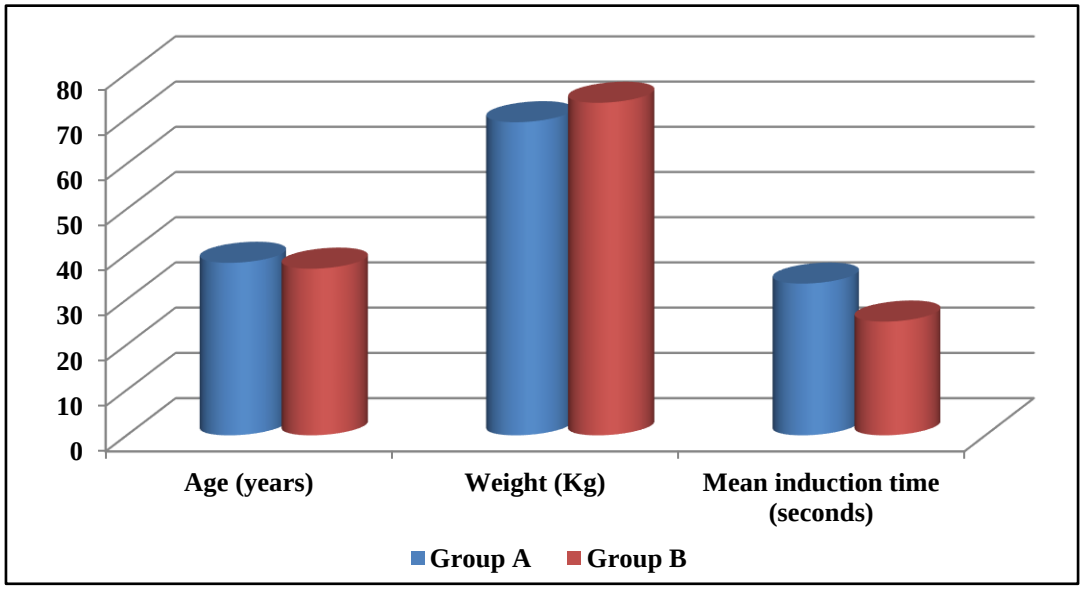

Table 1: Injection site feeling observed in the present study

Feeling at injection site	Group A (n)	Group B (n)
None	6	9
Pain	5	3
Others	4	3

RESULTS

A total of 30 subjects were included in the present study and were broadly divided into two study groups; group A and group B. 38.1 years and 36.8 years was the mean age of the subjects of the group A and group B respectively. 69.2 Kg and 73.5 Kg was the mean weight of the subjects of the group A and group B respectively. Mean induction time for the subjects of the group A and group B was 69.2 seconds and 73.5 seconds respectively. We observed significant difference wile comparing the mean induction time among the subjects of the two study groups. 6 patients in the group A and 9 patients in the group B didn't had any form of alternation or sensation at the site of injection, respectively. Pain at the site of inaction was observed in 5 and 3 patients of group A and group B respectively.

DISCUSSION

In the present study, we observed significant difference wile comparing the mean induction time among the subjects of the two study groups. 6 patients in the group A and 9 patients in the group B didn't had any form of alternation or sensation at the site of injection, respectively. Pain at the site of inaction was observed in 5 and 3 patients of group A and group B respectively. Helbo-Hansen S et al studied the effects of addition of 1 ml of lignocaine (10 mg) or isotonic saline to 19 ml of the emulsified preparation of propofol (Diprivan) were studied in 80 patients. The incidence and severity of pain on injection of propofol were significantly reduced by the addition of lignocaine.[7]

Barker P et al compared the efficacy of three methods of preventing pain during injection of propofol on induction of anaesthesia. Patients were allocated randomly to receive unmodified propofol, propofol with 0.05% lignocaine, propofol at 4 degrees C and unmodified propofol preceded by 10 ml of 0.9% saline at 4 degrees C. Prior injection of cold saline reduced the incidence of pain and discomfort significantly (22%) compared with unmodified propofol (75%; p less than 0.005) and was similar to that after cold propofol (33%) and propofol with lignocaine (44%). There was no significant difference between the treatment groups.[8] Borazan H et al compared the efficacy of pretreatment with paracetamol 0.5 mg kg(-1), 1 mg kg(-1), 2 mg kg(-1) and

lidocaine 0.5 mg kg(-1) for prevention of propofol induced pain. 250 adult patients ASA I or II, scheduled to undergo elective surgery, were randomly assigned into five groups of 50 each. Group P0.5, group P1 and group P2 received 0.5, 1 and 2 mg kg(-1) paracetamol respectively; group L received 0.5 mg kg(-1) lidocaine; and the control group, group C, received isotonic saline pretreatment in the dorsum of the hand, followed by propofol 1 min later. A blinded researcher assessed the patient's pain level via a four-point scale. When given as venous retention pretreatments 1 min before propofol, paracetamol 1 mg kg(-1) and lidocaine 0.5 mg kg(-1) were equally effective in attenuating pain during intravenous (i.v.) injection of propofol whereas pretreatment with paracetamol 2 mg kg(-1) was shown to be the most effective treatment.[9]

Different methods have been used to decrease the discomfort of pain for drug-pretreatment by brief venous retention with tourniquet, which is used prior to propofol injection, that isolates the forearm veins from the rest of the circulation. It presents a useful model for studying the peripheral actions of a drug in the absence of a central effect.[10]

Agarwal A et al compared the efficacy of ephedrine 30 microg/kg pretreatment to lignocaine 40 mg for prevention of propofol-induced pain. Ninety-three adult patients, ASA 1 and 2, undergoing elective laparoscopic cholecystectomy were randomly assigned to three groups of 31 each. Group 1 received normal saline, group 2 received lignocaine 2% (40 mg) and group 3 received 30 microg/kg ephedrine. All pretreatment drugs were made up to 2 ml. Pain at the time of propofol injection was assessed on a four-point scale: 0=no pain, 1 =mild pain, 2=moderate pain, and 3=severe pain. Twenty-seven patients (87%) of ephedrine pretreatment patients had pain during intravenous injection of propofol as compared to 24 (77%) in the normal saline group. In the lignocaine group, propofol-induced pain was observed in only 13 (42%) when compared with other study groups ($P<0.05$). Pretreatment with 2% lignocaine (40 mg) was effective in attenuating propofol-associated pain.[11] Ahmad N et al studied the effect of fentanyl pretreatment on alleviating pain during the injection of Propofol-Lipuro. One hundred and seventy patients were randomly allocated to receive either 100 mcg of intravenous fentanyl or normal saline (placebo) followed by intravenous Propofol-Lipuro premixed with 20 mg lignocaine. The incidence of injection pain was 32% and 13% in the placebo and fentanyl groups, respectively. We found a statistically significant reduction in incidence of injection pain in the fentanyl group when compared with the placebo group ($p<0.003$). The number needed to treat was 6 (3.2< 95% CI <15.1). In conclusion, fentanyl pretreatment is effective in alleviating pain during injection of Propofol-Lipuro.[12]

CONCLUSION

Under the light of above obtained results, the authors conclude that significantly less sensation and alterations at the injection site is seen when propofol is given in the forearm / antecubital fossa.

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