

₹ 200

ISSN - 2249-555X

Volume : 1

Issue : 5

February 2012



Journal for All Subjects

www.ijar.in

Listed in International ISSN Directory, Paris.



ISSN - 2249-555X

Indian Journal of Applied Research

Journal for All Subjects

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Pretreatment With Ephedrine For Prevention Of Pain Associated With Propofol Injection.

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ABSTRACT

Background: Aim of this double blind, randomized comparative study was to assess the efficacy and safety of ephedrine and lidocaine pretreatment after venous occlusion on the pain produced by IV injection of propofol. **Methods:** 90 patients of ASA I and II status scheduled for elective surgery under general anaesthesia were randomly allocated in three groups of 30 each using computer generated table of random numbers. Venous occlusion was made with tourniquet for one minute to nondominant hand which has secured IVline. The study drug , injection ephedrine 30µg/kg diluted with 0.9% NS up to 2 ml (Group II , n=30) or 2% injection lidocaine 2ml (Group III , n=30) along with placebo 0.9% NS 2 ml (Group I , n=30) was administered over 5 seconds. There after venous occlusion was released after one minute and intravenous propofol was given. Pain was assessed by a four point verbal rating scale. Heart Rate and Mean Arterial Pressure(MAP) were recorded. **Result:** There was significant reduction in the incidence of pain associated with propofol administration in patients pretreated with ephedrine and lidocaine group (p0.05). There was significant decrease in MAP just before intubation in control and lidocaine group compare to ephedrine group. **Conclusion** we conclude that ephedrine and lidocaine are effective in reducing the incidence of pain during propofol injection.

Keywords : Propofol, Ephedrine, Lidocaine, Pain, Intravenous Injection

Introduction

Propofol is a popular intravenous anaesthetic agent, because of its rapidity and reliability in causing loss of unconsciousness associated with quick and smooth recovery. However pain on injection is a major disadvantage and may be recalled as unpleasant experience by the patient. In adult, incidence of pain varies from 28 to 90%.

The most frequently used method to reduce pain is the administration of lidocaine, either before propofol injection with or without tourniquet or added to propofol emulsion as a premixture. We need to have other alternate drugs, which have fewer side effects and can be used when there are other contraindications to lidocaine

Ephedrine is both direct and indirectly acting sympathomimetic drug. It has an agonist action on both α and β adrenergic receptors and it enhances the release of norepinephrine from sympathetic neurons. It causes attenuation of pain by decreasing bradykinin release from vascular endothelium. The effect of ephedrine pretreatment after venous occlusion for prevention of propofol induced pain has not been studied.

Primary aim of the present study was to evaluate the efficacy of lidocaine 2% (40 mg) for prevention of pain associated with propofol injection and compared its efficacy with that of small dose ephedrine pretreatment (30µg/kg) after venous occlusion of the forearm, one minute before injection of propofol. Secondary aim was to study the haemodynamic safety and adverse effects if any.

Material And Methods

A prospective, randomized, controlled double blind study was

conducted after approval of the institutional ethics committee. Informed consent was taken from the patients who were included in the study.

Inclusion criteria

- 1 ASA I-II status patients
- 2 Patient aged 19-59 years of either gender.
- 3 Unpremeditated patients scheduled for elective surgery under general anaesthesia.

Exclusion criteria

- 1 Patient taking sedatives and analgesics
- 2 History of allergic, neurological or cardiovascular disease.
- 3 Patient on any antiarrhythmic drug.

On arrival at operation theatre routine monitoring was applied and a 20 G cannula was inserted into a suitable vein on the dorsum of nondominant hand .Ringer lactate solution was started. Patient received no premedications.

The patients were randomly assigned to 3 groups (30 in each) using computer generated randomization, to receive pretreatment solution.

Group I: Patients receiving 0.9% normal saline 2 ml.

Group II: Patients receiving injection ephedrine 30 µg/kg diluted with 0.9% normal saline upto 2 ml.

Group III: Patients receiving 2% lidocaine 2ml.

All the syringes of test solution were prepared by a person who was not taking part in the case study. The person who assessed the patient's response was unaware of the nature of the solution. Pretreatment solution was injected over a period of 5 seconds while venous drainage in upper limb was occluded at mid forearm by a simple tourniquet with vacro strap in order to produce 'Mini Bier block'.

Tourniquet was released 1 minute after injection of pretreatment solution and 1% propofol 2.5 mg/kg was given through intravenous catheter at 1 ml/second. All drugs were kept at room temperature and used within 30 minutes of preparation. The anaesthetist blinded to the study drug, evaluated the pain according to verbal rating scale (VRS), as well as facial expression and behavioural changes every 5 seconds during propofol injection and highest degree of pain recorded. The patient were asked to grade any associated pain or discomfort using a four point verbal rating scale that had been previously described to them. Pain was graded from 0 to 3 in accordance to scale advocated by McCrirrick and Hunter.

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 a behavioral sign or pain reported spontaneously without questioning).

3 - Severe pain (strong vocal response or response accompanied by facial grimacing, arm with- draw or tears).

Thereafter induction of anaesthesia was continued with rest of propofol dose. Following loss of consciousness, injection vecuronium bromide was administered to facilitate endotracheal intubation. Anaesthesia was maintained with isoflurane 0.5-2% and Nitrous oxide 60 % in oxygen with controlled ventilation. Heart rate and mean arterial pressure were recorded before induction, just before intubation and 1, 2 and 3 minutes after intubation. Anaesthesia was maintained as per the institutional protocol for scheduled surgery.

Statistical analysis was conducted using SPSS version 17.0. Descriptive statistics such as mean and standard deviation have been used to summarize the baseline clinical and demographic profile of the patient. We have used two independent sample 't' test to find out significance in control and lidocaine group as well as in control and ephedrine group. Students paired 't' test was used to find out significant difference within the group. Statistical test used at 95% confidential interval. P<0.05 was considered as statistically significant.

Result

Table 1 Demographic data: values are expressed as mean ±SD

	Group I (n=30)	Group II (n=30)	Group III (n=30)
Age	39.23±11.12	39.80±12.91	42.40±12.56
Weight	60.63±10.15	61.23±12.16	57.47±11.59
Sex (M:F) ratio	15:15	14:16	16:14

All the three groups were comparable with respect to age, weight and male:female ratio. (Table 1).

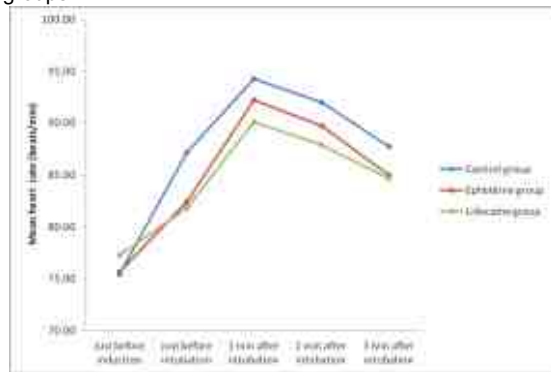
Table 2 Assessment of pain during injection of propofol

Verbal pain score	Group I (n= 30)	Group II (n= 30)	Group III (n= 30)
0 None	3 (10.0%)	17(56.67%)	18 (60%)
1 Mild pain	4(13.33%)	9 (30.0%)	9 (30.0%)
2 Moderate pain	11(36.67%)	2 (6.67%)	2 (6.7%)
3 Severe pain	12 (40.0%)	2 (6.67%)	1 (3.33%)
Median pain score	2	0	0

Data presented as numbers (%).

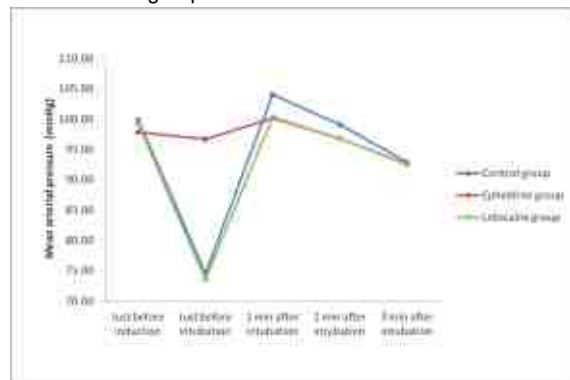
The overall incidence of pain during IV injection of propofol in all three groups is shown in table 2. In control group 27 (90%) patients had pain during propofol injection compared with 13 (43.3%) patients in ephedrine and 12 (40%) patients in lidocaine group (p0.05). Intergroup comparison revealed that incidence of pain at propofol injection was less in both the study groups compared with the control group (p0.05)(Table2). Pretreatment with ephedrine 30µg/kg and 2% lidocaine 40mg were equally effective in attenuating pain during IV injection of propofol (p0.05).

Fig. 1 Changes in mean heart rate at different interval in three groups



Mean heart rate just before induction, just before intubation and 1, 2, and 3 minute after intubation in all three groups was statistically not significant (p0.05). (Fig 1)

Fig. 2 Changes in mean arterial pressure (MAP) at different interval in three groups



In our study, we found that, just before intubation MAP was significantly decreased in control and lidocaine group as compared to ephedrine group (p0.05). (Fig.2)

None of the patient developed profound hypotension or bradycardia that required treatment. In our study we did not found adverse hemodynamic effect with pretreatment of ephedrine and lidocaine .

Discussion

Propofol produces a good quality of anaesthesia and rapid recovery. However, it often has the disadvantage of causing pain or discomfort on injection.

Propofol belongs to group of phenol that can irritate the skin, mucous membrane, and venous intima. Scott et al speculated that the injection pain is caused by activation of the kallikrein-kinin system either by propofol or the lipid solvent, there by generating kinins probably bradykinin. Bradykinin, by producing local vasodilatation and hyper permeability, may increase the contact between the aqueous phase propofol and the free nerve ending resulting in pain on injection. This pain has a 10-20s delayed onset. But immediate pain may be caused by direct irritation of afferent nerve ending within the veins. In the present study a blinded anaesthesiologist asked the patient to evaluate the pain score every 5 seconds during propofol injection and then recorded the highest degree of pain.

Based on proposed mechanism and factors associated with propofol injection pain, several methods for prevention of pain have been tried with varying degree of success. Various studies have recommended using larger veins; decreasing speed of injection; injecting the drug into a fast running IV fluid; diluting it with 5% glucose or 10% intralipid ; mixing lidocaine in propofol ; pretreating with lidocaine and venous occlusion ; pretreating with ondansetron, metaclopramide alfentanil, fentanyl, or pentothal; cooling propofol to 4°C; injecting cold saline (4°C) before propofol; or discontinuing fluid during

the injection.

Among this, the most popular is the use of lidocaine either by mixing lidocaine with propofol or by pretreatment with a bolus injection of lidocaine. The mechanism of pain relief can be two fold; first by reduction of propofol in aqueous phase and second by lidocaine acting as a stabilizer in kinin cascade. The analgesic effect of lidocaine may occur because of a local anaesthetic effect or an inhibitory effect on the enzymatic cascade which leads to release of kinin. However, even in patient who received lidocaine treatment, the incidence of pain has been reported to be as frequent as 32% in King SY et al study, 48 % in O'Hara JR study or 43.3 % in Mi A Cheong study. In our study we found that incidence of pain was 90% in control group, 44% in lidocaine group, 43.3% in ephedrine group.

Propofol ephedrine combination is chemically compatible and stable, and maintains blood pressure and cardiac output without tachycardia or other adverse effect. The mechanism responsible for the propofol injection pain relief is unknown; however the activation of the pain mediators such as the kinin cascade system has been suggested.

In our study, we found that incidence of pain was significantly lower in ephedrine and lidocaine group compared to control group which confirms with the previous study. Considering the haemodynamic effect of propofol and ephedrine Mi A Cheong et al, have recommended a small dose of ephedrine (30 & 70 µg/kg) suitable to reduce propofol induced pain compared with lidocaine or a large dose of ephedrine (110 & 150 µg/kg). We administered comparatively smaller dose of ephedrine (30 µg/kg) and observed effective attenuation of propofol pain.

We administered ephedrine after venous occlusion that was released after 1 min. Duration of venous occlusion and the dose of lidocaine used was based on a metaanalysis that concluded that the optimal method for prevention of propofol associated pain is to give IV lidocaine 0.5 mg/kg while a tourniquet is applied to the forearm for a period of 30-120 s before injection of propofol. Therefore, postulation that ephedrine may have had a better opportunity to act locally by preventing the release of bradykinin associated with injection of propofol and thus prevent propofol pain. However such an

affirmation deserves closer investigation

In our study, before intubation MAP was significantly decreased in control and lidocaine groups compared to ephedrine group. A small dose of intravenous ephedrine could prevent propofol induce hypotension before intubation and did not produce significant haemodynamic changes. The present study findings corroborate with those of previous studies.

None of the patient developed profound hypotension or bradycardia that required treatment. There were no adverse events such as arrhythmias, severe hypertension, allergic reactions or cardiovascular collapse during induction. Thus proving the safety along with efficacy of pretreatment drug.

Dedic et al. concluded that combined premedication regimen with midazolam, diclofenac sodium, and acetaminophen orally aimed at preoperative anxiety reduction and peri- and postoperative analgesia causes a significant reduction in experience of pain on propofol injection. We did not administer any analgesics for premedication to avoid interference with pain perception.

The visual analog scale and VRS were commonly used for assessing acute pain. The visual analog scale is the most sensitive for pain detection and evaluation of analgesic efficacy. But during propofol injection, capacities for abstraction were poor, reading tasks were difficult, and motor coordination was disturbed. We therefore used VRS, facial expression and behavioural changes for assessing pain scores.

CONCLUSION

The pain on injection of propofol is multifactorial. Minimizing the propofol injection pain is an important clinical goal because it may influence the patient's perception of quality and acceptability of anaesthesia. Present study concludes that, pretreatment with ephedrine 30 µg/kg and lidocaine 40 mg is equally effective in reducing the incidence of pain during propofol injection. Ephedrine pretreatment can be considered as an alternative to lidocaine with an added advantage of attenuating propofol induced hypotension just before tracheal intubation.

REFERENCES

- Fairfield JE, Dritsas A, Beale RJ. Haemodynamic effects of propofol: induction with 2.5 mg kg⁻¹. Br J Anaesth 1991; 67: 618-20. Gamlin F, Vucevic M, Winslow L, Berridge J. The haemodynamic effects of propofol in combination with ephedrine. Anaesthesia 1996; 51: 488-91. King SY, Davis FM, Wells JE, et al. Lidocaine for the prevention of pain due to injection of propofol. Anesth Analg 1992; 74: 246-9. Mangar D, Holak EJ. Tourniquet at 50 mmHg followed by intravenous lignocaine diminishes hand pain associated with propofol injection. Anesth Analg 1992; 74: 250-2. McCrerrick A, Hunter S. Pain on injection of propofol: The effect of injectate temperature. Anaesthesia 1990; 45: 443-4. Mi A, Cheong, Kyo S, Kim, Won J, Choi. Ephedrine reduces the pain from propofol injection. Anesth Analg 2002; 95: 1293-6. Ohnhauss EE, Adler R. Methodological problem in the measurement of pain: A comparison between the verbal rating scale and the visual analogue scale. Pain 1975; 1: 379. Picard P, Tramer MR. Prevention of pain on injection with propofol: A quantitative systematic review. Anesth Analg 2000; 90: 963-9. Stark Rd, Binks SM, Dutka VN, O'Connor KM, Arnstein MJ, Glen JB: A review of the safety and tolerance of propofol ('Diprivan'). Postgrad Med J 1985; 61 (Suppl.3): 152-6. Tan CH, Onsiang MK. Pain on injection of propofol. Anaesthesia 1998; 53: 468-76.



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