



Anaesthesiology

COMPARISON BETWEEN EFFECT OF INTRAVENOUS LIGNOCAINE AND KETAMINE IN ALLEVIATING PROPOFOL INJECTION PAIN IN PATIENTS UNDERGOING SURGERIES UNDER GENERAL ANAESTHESIA

Dr Saravana Kumar*

Postgraduate, Department of Anaesthesiology, Chettinad Hospital and Research Institute Kelambakkam, Tamilnadu. *Corresponding Author

Dr Sivagurunathan Jawahar

Postgraduate, Department of Anaesthesiology, Chettinad hospital and Research Institute, Kelambakkam, Tamilnadu.

Dr Ashok Kulasekhar

Professor and HOD, Department of Anaesthesiology, Chettinad hospital and Research Institute, Kelambakkam, Tamilnadu.

ABSTRACT

Background: Propofol is the most commonly used intravenous inducing agent. Sharp, burning or aching pain on injection is a major problem. The cardiovascular response to the pain can aggravate adverse events in patients with history of coronary artery disease. Small boluses of ketamine, magnesium, dexmedetomidine, ondansetron, dexamethasone, lignocaine hydrochloride, ketorolac, metoclopramide and opioids have been tried. **Aim:** To compare analgesic effects of using intravenous ketamine and lignocaine in alleviating pain following propofol injection. **Methods And Material:** A prospective randomized double blinded study was conducted in Chettinad Hospital and Research Institute, Kelambakkam among 50 participants undergoing surgeries under general anesthesia. Tourniquet was applied midarm, Group L was given 21.3mg of 2% lignocaine and Group K was given 15mg of ketamine. Tourniquet was removed after 30 seconds and then 1/3rd dose of total dose of 2mg/kg propofol was given. Degree of injection pain was evaluated using McCrirk Hunter scale. **Results:** Pain score on propofol injection was similar in both groups. Among the patients, 54% reported no pain, in that 76% patients were in Group L and 52% patients in Group K. McCRIRICK AND HUNTER PAIN SCALE rating between two groups are similar with the p value of more than 0.05. **Conclusions:** The pre-treatment of 15mg ketamine is as effective as 21.3mg 2% lignocaine in reducing the severity of propofol injection pain.

KEYWORDS : propofol, ketamine, lignocaine, propofol injection pain

INTRODUCTION:

Propofol is the most commonly used intravenous inducing agent internationally because of its rapid onset of action, smooth induction short duration of action, less side effects and rapid recovery properties. It is also used for maintenance and sedation in intensive care unit. Pain on injection is a major problem as it causes discomfort to patient and compromises the analgesia which is an important component of anesthesia^[1].

Few mechanisms have been proposed for the cause of propofol induced pain like release of nitric oxide from vessels^[2], vein's adventitia irritation leading to release of cytokines such as "kininogen, kinin^[3], ligand-gated cation channels like transient receptor potential ankyrin 1 and vanilloid 1 were considered as molecules activating peripheral nerve endings.^[4]

The neuropeptides released from the various terminals of sensory neurons induces venodilatation and vessel leakage and thereby causes inflammation in the periphery neurons and sensitizes root in the dorsal horn of spinal cord. Also it is found that increased amount of propofol in aqueous phase increases severity of pain and hence increasing oil emulsion formulations decreased pain.^{[5][6]}

Local anesthetic like lignocaine, a cation solution on exposed to lipids liberates protons and decreases the pH. Hence more propofol enters lipid phase and pain decreases.^[11]

The present study is aimed at comparing analgesic effect between intravenous ketamine and lignocaine in alleviating propofol injection pain.

MATERIALS AND METHODS:

The study was carried out in Department of Anaesthesiology, in Chettinad Hospital and Research Institute, Kelambakkam on 50 patients who underwent surgeries under general anaesthesia

Inclusion Criteria

American Society of Anaesthesiologists Grade I & II, 20 to 60 years of either sex.

Exclusion Criteria

Patient refusal, Known allergy for study drug, Pregnancy, Hemodynamic instability and cardiovascular diseases, American Society of Anaesthesiologists Grade III & IV.

It was a prospective, randomised double blinded study in which patients were allocated into 2 groups, Group L received 21.3 mg of lignocaine and Group K received 15 mg of ketamine. After applying tourniquet in midarm study drug in an above mentioned dose was injected to the patients and waited for 30 seconds. After 30 seconds, tourniquet was removed and one third of the required dose of propofol was injected and the intensity of pain was scored as per McCRIRICK and HUNTER SCALE during the propofol injection. Intraoperatively heart rate, blood pressure, oxygen saturation and end-tidal carbon dioxide were monitored.

MCCRIRICK AND HUNTER PAIN SCALE

NUMERICAL SCORE	RESPONSE	INTERPRETATION	INTERPRETATION FOR STATISTICAL ANALYSIS
0	Negative response to questions	No pain	No pain
1	Pain reported in response to questions	Mild pain	Mild pain
2	Voluntary complaint of pain	Moderate pain	Moderate / severe pain
3	Strong vocal response or facial grimacing	Severe pain	

RESULTS:**Test Of Significance:**

Independent sample T test was used in order to compare two means. Comparison between the groups on distribution of qualitative variables were done using Chi square test and Fisher's Exact test. All tests were two tailed and results were considered statistically significant if the p-value is < 0.05.

Comparison of demographic variables such as age, gender, weight, distribution among the groups were statistically insignificant.

Comparison of hemodynamic parameters such as Heart rate, Systolic

and Diastolic Blood Pressure, oxygen saturation among the groups were statistically insignificant.

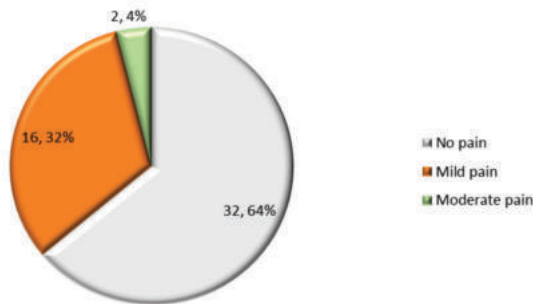
Comparison of McCririck and hunter pain scale between two groups were statistically insignificant as demonstrated in table 1 and figure 1.

Table 1: McCRIRICK And Hunter Pain Scale Between Group L And Group K.

McCIRICK AND HUNTER PAIN SCALE	Group L	Group K	Total	Chi square(χ^2) value, df, p value
No pain	19 (76.0%)	13 (52.0%)	32 (64.0%)	4.12, 2, 0.127
Mild pain	6 (24.0%)	10 (40.0%)	16 (32.0%)	
Moderate pain	0	2 (8.0%)	2 (4.0%)	
Total	25 (100%)	25 (100%)	50 (100%)	

No side effects were reported during the study.

Figure 1: McCRIRICK AND HUNTER PAIN SCALE rating among study participants



DISCUSSION:

The present study was a double blinded prospective randomised study carried out with an aim to evaluate the analgesic effect of 1ml of 2% lignocaine versus 15mg of ketamine for alleviating propofol injection pain in patients undergoing general anesthesia. In both the groups, baseline systolic, diastolic, mean arterial pressure and oxygen saturation was noted. Degree of injection pain was evaluated using McCRIRICK Hunter scale during propofol injection.

DOSAGE OF DRUG:

In this study we used 21.3 mg 2% Lignocaine and 15 mg Ketamine for comparison to alleviate propofol injection pain. Barbi E et al^[13] showed that 0.5 mg / kg Ketamine pre treatment was efficient to relieve Propofol injection pain than a mixture of lignocaine and propofol. Tan CH et al^[14] conducted a randomized study in 100 patients to study the efficacy of 10mg Ketamine to reduce propofol injection pain. He concluded that 10mg (0.2 mg / kg) dose was low and doesn't cause central analgesic effect but is enough to produce local anaesthetic action in peripheral intravenous line and effective to reduce Propofol injection pain. Sumalatha GB et al^[15] compared 0.5 mg / kg 2 % Lignocaine, Ramosetron and Ondansetron and proved that Lignocaine in 0.5 mg / kg reduced Propofol injection pain. Shivanna S et al^[12] compared the effects of 20 mg Lignocaine and Methylprednisolone and proved 38 % had no pain on injection, 14 % had mild pain with Lignocaine. Hence we chose minimum of 21.3 mg 2 % Lignocaine and 15 mg Ketamine to compare.

PAIN SCORE:

Out of 50 patients, 54% reported no pain, in that 76% patients were in Group L and 52% patients in Group K. Among the study participants, 32% reported mild pain - in that 24% belongs to Group L and 40% in Group K. Moderate pain was reported in 4.0% patients in Group K. severe pain was not reported in both groups. McCRIRICK and Hunter pain scale rating between two groups are similar with the p value of 0.127 which was more than 0.05.

Similar pain score was seen in study done by Thukral S et al^[1] who used 0.5mg/kg ketamine in 54 patients to reduce propofol injection pain where 59% reported no pain, 38.95% reported mild pain after propofol injection.

Similar pain score was seen in study done by Shivanna S et al^[12] who used 20mg lignocaine in 55 patients to reduce propofol injection pain where 69% reported no pain, 25.5% reported mild pain, 3.6% reported moderate pain after propofol injection.

Also Sumalatha GB et al^[15] used 0.5mg/kg 2% lignocaine in 50 patients to reduce propofol injection pain where 76% reported no pain, 18% reported mild pain, 4% reported moderate pain after propofol injection similar to our study.

CONCLUSION:

The pre-treatment of 15mg ketamine is as effective as 21.3mg 2% lignocaine in reducing the severity of propofol injection pain.

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CONFLICT OF INTEREST:

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.

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