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PRE-TREATMENT WITH DIFFERENT CONCENTRATIONS OF LIGNOCAINE FOR ALLEVIATION OF PAIN WITH PROPOFOL INJECTION

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Abstract
Pain with propofol is known to be very unpleasant to patients. It is been used widely for day care surgeries, for induction of general anaesthesia and ICU sedation. Different drugs are being used to reduce pain. Using a large vein and lignocaine is one of the methods proven to reduce pain with propofol. We used different concentration of lignocaine to reduce the pain on propofol injection and found that lignocaine 0.5% was equally effective compared to 1% lignocaine as pretreatment with tourniquet.

Key Words: Lignocaine, pain, propofol.

Introduction
Propofol is being used widely for Induction of General Anaesthesia and For Day Care Anaesthesia. It is also known to cause pain on injection; the mechanism for pain associated with intravenous administration of propofol is believed to be related to the release of nitric oxide, which can be reduced with choosing a large vein and use of plain lignocaine as pretreatment. Various drugs have been tried to reduce this pain on Propofol injection.

Aim/Objective
To compare the efficacy of Lignocaine in 2 different concentrations to alleviate the pain on Propofol injection using Visual analog scale (VAS).

Hypothesis
Use of 0.5 % Lignocaine reduces the pain on Propofol injection.

Methodology

Inclusion Criteria: All ASA Grade I, II patients planned for Elective surgery under GA/Sedation/Day care Anaesthesia; Age group of 18 to 80 years; Body weight between 35 & 80kgs.
Exclusion Criteria: Patients with disorders of lipid metabolism; Patients with past history of an adverse response with

propofol or lignocaine; Patients with history of chronic pain syndromes / analgesic drugs; Patients with history of convulsions, head injury; Patients with cardiac conduction defects or on anti-arrythmic drugs ; Patients with difficult airway; Pregnant and lactating mothers.After Institutional Ethical clearance, 90 patients were included in this study and as per the randomised table, there were 45 in each group. Group A (0.5 % lignocaine) ;Group B (1 % lignocaine).All patients was given Tab Rantac 150 mg ,Tab Alprazolam 0.25 mg on the previous night and at 6 am on the day of surgery with a sip of water. After premedication followed by Pre-oxygenation for 3 min. Patients were randomised to receive a pre treatment with 4 ml solution (test drug) over 10 seconds intravenously with venous occlusion (70 mm Hg) with a rubber tourniquet for 1minute, followed by propofol 0.5 mg/kg (25% of the total calculated dose of propofol (2.0 mg/kg))in to the largest vein of the hand through a 20-gauge IV cannula over 10 seconds. Group A received 4mL of IV 0.5 % lignocaine (20 mg); Group B received 4 ml of IV 1% lignocaine (40 mg) .Immediately after the administration of protocol, (during a 10-second pause before the induction of anesthesia) an investigator interviewed each patient on injection-site pain and intensity. Responses were scored on a 4-point verbal rating scale (0 = none, 1 = mild pain, 2 = moderate pain, and 3 = severe pain). Incidence and intensity of pain (as assessed by mean pain scores) was determined in each of the study groups. Adverse Events at the injection site were assessed for 24 hours following surgery.

Sample size & Statistical methods

Based on previous studies our sample size was taken as 45 in each group. Parametric date (age, weight) was analyzed by Independent T test and Nonparametric data (VAS) was analyzed by Mann Whitney U test.P value less than 0.05 will be considered statistically significant.

Results

There were 18 (40%) females and 27 (60%) males in group A; 31 females (69%) and 14 (31%) males in group B.In our study we found that the groups were age and weight matched and VAS scores were showing NO pain (0) or MILD pain(1) and it was not statistically significant (p value0.240)(Table-1)

PARAMETERS	GROUPS		P Value
	A	B	
AGE	36±13.23	36±14.08	0.712
WEIGHT	58±9.55	57±7.40	0.053
VAS	0.08±0.26	0.5±0.50	0.240

Table-1: Shows age, weight (wt.) and VAS scores in Group A & Group B In our study we found that the groups were age and weight matched and VAS scores were showing NO pain (0) or MILD pain(1) and it was not statistically significant.

Discussion

Propofol is widely used for sedation and anaesthesia because of its high quality of anaesthesia with rapid recovery in addition to the very useful antiemetic property. The incidence of pain caused by propofol injection was reported to range from 28% to 90% in adults if a vein on the dorsum of the hand is used [1]. In one study Lignocaine was more effective in reducing pain on injection of propofol when it was given as a mixture than when administered as pre-treatment before the propofol injection [2].Another study shows tourniquet-controlled pre-treatment with lignocaine was superior to admixing lignocaine with

propofol for reducing propofol injection pain intensity [3].Though exact mechanism of lidocaine reducing propofol-induced pain remains unclear, it may be possible that lidocaine pre-treatment may induce bradykinin generation associated with activation of the plasma kallikrein–kinin system. Venous occlusion may block the nerve fibres that are responsible for transmission of pain resulting from direct irritation of the inner blood vessel walls by propofol [4].Propofol belongs to the group of phenols that can irritate the skin, mucous membranes, and venousintima. Injection pain associated with propofol characteristically occurs immediately or later after the drug injection with a delayed response of 10-20 seconds. The explanation for the pain includes endothelial irritation, osmolality differences, unphysiological pH, and the activation of pain mediators [5]. Pre-treatment with 40 mg or 0.5 mg/kg lidocaine with venous occlusion of the upper limb is recommended for alleviating injection pain associated with lipid emulsion propofol administration [6]. In a study by King *et al*.[27], it was found that lidocaine (20 mg IV) significantly reduced the incidence and severity of pain with propofol injection, but about 6% of patients still suffered pain if the dorsum of the hand was used [7]. Many methods have been tried to reduce the incidence of pain on propofol injection. Lignocaine added to or given before injection of propofol was employed with a failure rate of between 13% and 44% [8.9]. Cooling the propofol to 4°C was found to reduce pain possibly by delaying the activation of enzymatic cascade of pain mediators [10]. Injecting into a large vein was found to reduce the pain, probably by reducing contact between drug and endothelium. Diluting intralipid, and the application of eutectic mixture of local anaesthetic cream to the skin before venepuncture has been reported to reduce the incidence of propofol injection pain [11, 12].Ondansetron had been studied and is shown to relieve pain by its multifaceted actions as a Na channel blocker, a $5HT_3$receptor antagonist and mu opioid agonist [13, 14].The reported incidence of pain to propofol injection along with lignocaine pretreatment has been reported to be 35% [15]. In our study we have considered pretreatment with different concentration of lignocaine for alleviation of pain on propofol injection (Group A 0.5%-20mg and Group B 1%-40mg) and VAS scores were showing NO pain (0) or MILD pain(1) and it was not statistically significant (p value 0.240).

Conclusion

Our findings show that pretreatment with 0.5% Lignocaine had the same effect as with 1% lignocaine, so 0.5 % lignocaine is equally effective in alleviating pain response to propofol injection.

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