ORIGINAL ARTICLE

Comparison of Thiopental Sodium and Lidocaine to Prevent the Pain Associated with Propofol Injection

MUHAMMAD AZAM[1], MUHAMMAD RASHID[2], MUHAMMAD YOUNIS[3], *TANVEER AKHTAR BUTT[4]*
[1]Senior Registrar,
[2]Assistant Professor,
[3]Associate Professor, Department of Anesthesia, University College of Medicine & Dentistry, University of Lahore
[4]Professor, Department of Anesthesia, Central Park Medical College and Hospital, Lahore
Correspondence to Dr. Muhammad Azam drm.azam78@gmail.com 03006711738

ABSTRACT

Aim: To determine whether the pretreatment with thiopental sodium 0,5mg is better than lidocaine 40mg to prevent the pain associated with propofol injection.
Study Design: Randomized control trial.
Place & Duration: Department of Anesthesiology, Central Park Medical College and Hospital Lahore from 1st January 2019 to 30th June 2019.
Methods: One hundred cases of ASA I-II aged 18-20 years old for elective surgery under general anesthesia were included. They were divided in two groups; group A and group B, each comprised 50 patients. At the time of induction of general anesthesia, group A was pretreated with injection thiopental sodium 0,5mg /kg and group B was with injection lidocaine 40mg after applying the tourniquet. All study drugs were made into 2ml with normal saline. The patient were observed and asked for pain after every 5-10 sec during the induction of propofol injection.
Results: Patients in group A reported a significantly less pain as compared to group B.
Conclusion: Using the thiopental sodium 0,5mg/kg before induction with propofol injection is better and safe to prevent the pain caused by propofol injection is better than lidocaine 40mg in elective surgery.
Keyword: Propofol, Thiopental sodium, Lidocaine

INTRODUCTION

Anesthesia is defined as "an altered physiological state characterized by reversible loss of consciousness, analgesia of the entire body, amnesia, and some degree of muscle relaxation[1]. Propofol is frequently used for sedation, induction and maintenance of anesthesia[2]. However pain on injection of this agent is considerable problem in daily anesthesia practice because of its severity[3]. Despite significant advances in the understanding and management of propofol pain, inadequate pain control remains one of the most common complaint of many patient.

Propofol is the drug of choice for induction of anaesthesia in millions of patients every year because of its rapid onset and short duration of action, easy titration, and favourable profile for side effects.[4] Several methods have been described to reduce this pain, of which most effective and common are the use of a larger vein and mixing with lignocaine.[5-6] Efficacy of various drugs such as lignocaine, tramadol, ketorolac and ketoprofen have been compared in reducing the propofol-induced pain.[7] Furthermore, the analgesic efficacy of drugs such as ketamine and combination of clonidine-ephedrine have been studied by various investigators[8]. Dexmedetomidine a newer α adrenergic agonist has been used to alleviate propofol injection pain[7].

Propofol is a phenol compound that causes skin and mucous membrane irritation, leading to pain at the injection site in 80% to 90% of people. Although the underlying mechanisms are still not fully understood, pain immediately after injection of propofol may be caused either by direct stimulation of nociceptors and free nerve endings in the venous wall or indirectly by the release of mediators, such as bradykinin and prostaglandin E2, which stimulate afferent nerve endings, leading to a delayed onset of pain when used for anesthetic induction, diprivan causes pain or discomfort in a large number of patients with many factors affecting the incidence and severity[9-11].

The aqueous phase propofol diffuses into more free nerve endings outside the endothelial layer of the vessel which is more permeable and dilated because of bradikinin effect, thereby intensifying pain on injection. Local anesthetics are often or pretreated to reduce the pain associated with propofol injection.[12] The present study was conducted aimed to compare thiopental sodium and lidocaine to prevent the pain associated with propofol injection.

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MATERIALS AND METHODS

This randomized controlled trial at Department of Anesthesiology, Central Park Medical College and Hospital Lahore from 1st January 2019 to 30th June 2019 and comprised 100 cases. They were divided in two groups, Group A (Lidocain 2% (40ml)) and Group B (Thiopental 0.5ml/kg). ASA I or II patients, age 18-50 years, procedure lasting for 1-2 hour and patients schedule to undergo elective surgery were included. Patients having any contraindication to general anesthesia, any contraindication to induce with Propofol, Thiopental or Lidocain e.g. allergic to these drugs, language problem, mentally retarded etc, complaining of pain in that limb and chronic pain medication were excluded. Each patient will be premedicated with tablet Midazolam 7.5 mg a night before

operation. In the operating room, standard monitoring including non-invasive blood pressure measurement, pulse oximetry and electrocardiography will be done. Intravenous access will be secured with 18G cannula one on the dorsum of the dedicated hand and other 18G cannula on the dorsum of the other hand.

All study drugs will be made into 2ml with Normal Saline and will be administered over 5 Sec in a dedicated IV line in a vein on the dorsum of the non-dependent hand while the venous drainage will be occluded manually at the middle of the forearm just before the administration of the study drug and will be maintained for 1 min. Another cannula which is placed on the other hand is used for infusion of IV fluids. Patients then will be given 1/4th of the total calculated dose of Propofol over 5 Sec. Before induction of anesthesia, patient is informed that if he feel pain, he will complain it. During the Propofol injection, Patients will be continuously observed for pain for 30 seconds. Efficacy will measured on visual analogue scale (0; no pain) at the time of induction of anesthesia. The data was entered and analyzed through SPSS-20.

RESULTS

There were 24(48%) patients were male and 26(52%) were female in A while in group B, 21(42%) patients were male whereas 29(58%) were female with mean age was 29.87±6.99 years in group A and 30.78±7.88 years in group B (Table 1). In group A, 20 patients complain of pain after injection whereas 2(9.1%) patients in group B. In group A, 30(38.5%) patients showed no pain while in group B, 48(61.5%) patients showed no pain. Statistically there was significant difference [P<0.05] (Table 2).

Table 1: Demographic information of the patients (n=100)

Variable	Group A		Group B	
	No.	%	No.	%
Gender				
Male	24	48.0	21	42.0
Female	26	52.0	29	58.0
Age (years)				
18 – 34	23	46.0	18	36.0
35 – 50	27	54.0	32	64.0

Table 2: Frequency of efficacy in both groups

Efficacy	Group A	Group B	Total
Yes	20	2	22
No	30	48	78

X = 18.881 df = 1 P = .000

DISCUSSION

Propofol is widely used for induction of anaesthesia, although the pain during its injection remains a concern for all anaesthesiologists. A number of techniques have been adopted to minimise propofol-induced pain.[13,14] The present study was conducted to examine the efficacy of thiopental 0.5mg/kg and compare with lidocaine for prevention of pain associated with propofol injection. In this regard 100 patients were analyzed in which 50 received thiopental 0.5mg/kg and 50 patients received lidocaine 40mg. Female patients in both groups were high in numbers 52% and 58% as compared to males 48% and 42% in group A and B. Majority of patients 59% were ages 35 to 50 years. These results showed similarity to many of previous studies in which female patients population was high 55% to 70% as compared to males and majority of patients were ages above 35 years[15,16].

In this study we found that thiopental 0.5mg/kg had higher efficacy than lidocaine 40mg for prevention of pain. We found that patients received thiopental had efficacy rate 40% as compared to 4% in lidocaine group. A study conducted by Akbari et al[17] regarding efficacy of ketamine, magnesium sulphate and sodium thiopental on propofol injection pain and they reported that frequency of pain was 36% in the magnesium sulfate group, 16% in the sodium-thiopental group, and 4% in the ketamine group, a significant less pain was reported in thiopental and ketamine when compared the results with magnesium sulphate. Kumar et al[18] reported that thiopental 0.5mg/kg showed significantly less pain as compared to lidocaine.

Abou Slemah et al[19] conducted study to examine the effectiveness of lidocaine and ondansetron for prevention of propofol injection pain and demonstrated that pain rate was higher in lidocaine group as compared to ondansetron. However, no significant difference was observed between both injection regarding pain.

Ahmad et al[20] conducted study regarding effect of Intravenous dexamethasone and lidocaine on propofol-induced vascular pain and demonstrated that incidence of moderate to severe pain following the injection of propofol was significantly decreased with both lidocaine and dexamethasone. A study conducted by Sargin et al[21] reported that hyoscin N-butylbromide showed significant less pain when compared to sodium chloride.

Safan et al[22] reported venous priming with metoclopramide 10 mg with mid-arm tourniquet applied for one minute is effective modality for alleviation of propofol injection pain else patients received lidocaine showed significantly better analgesia compared to those received 2.5 mg metoclopramide.

CONCLUSION

Pretreatment with thiopental sodium 0.5mg/kg is better than lidocaine 40mg to prevent the pain associated with the propofol injection on the induction of general anesthesia.

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