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A comparative study of lignocaine with methylprednisolone in reducing pain of propofol injection

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Abstract

Background: Propofol is an anaesthetic drug (an induction agent) which is given to induce and maintain anaesthesia. The present study was conducted to compare lignocaine with methylprednisolone in reducing pain of propofol injection.

Materials & Methods: The present study was conducted on 40 patients of both genders undergoing elective surgery. Patients were divided into 2 groups of 20 each. Group I patients received pre-treatment with lignocaine (20 mg of 2% solution diluted to 2 ml with distilled water), and group II patients received pre-treatment with methylprednisolone sodium succinate (125 mg diluted into 2 ml of distilled water). Pain on propofol injection was evaluated by four-point verbal rating scale.

Results: It was seen that 34 patients in group I and 35 in group II had pain score 1, 4 in group I and 2 in group II had 2 and 2 in group I and 3 in group II had score 3. The difference was significant ($P < 0.05$).

Conclusion: Methylprednisolone found to be equally effective in reducing pain of propofol injection when compared with lignocaine.

Keywords: Lignocaine, methylprednisolone, propofol

Introduction

Propofol is an anaesthetic drug (an induction agent) which is given to induce and maintain anaesthesia in adults undergoing surgery. Propofol is a popular induction agent because it provides a smooth induction and faster recovery than other drugs such as thiopental. The main disadvantage of propofol is that it often causes people severe pain [1].

The quality of pain is described as extremely sharp, aching or burning. In addition, the hyperdynamic cardiovascular response to the pain can precipitate adverse events in high-risk patients with a history of coronary artery disease and/or abnormal heart rhythm. This is because propofol is usually injected into a hand vein and can cause skin irritation. This can make the anaesthesia experience unpleasant [2].

Apart from pain on injection, the current lipid formulation has other disadvantages such as bacterial contamination, anaphylaxis, hyperlipidemia, and propofol infusion syndrome when used for sedation for a prolonged period. Hence, search for a better formulation continues till today [3].

One method for preventing propofol-induced pain is to give lidocaine either before the propofol injection or mixed in with the propofol. Lidocaine is a commonly used low-cost local anaesthetic drug. Dexamethasone has been shown to reduce propofol injection pain.⁴ Methylprednisolone is commonly used during cardiopulmonary bypass to reduce inflammatory response at doses of 10–30 mg/kg body weight. Methylprednisolone sodium succinate for injection is available in 40 mg, 125 mg, 500 mg and 1000 mg strengths [5]. The present study was conducted to compare lignocaine with methylprednisolone in reducing pain of propofol injection.

Materials and Methods

The present study was conducted in the department of Anesthesiology. It comprised of 40 patients of both genders undergoing elective surgery. The study protocol was approved from institutional ethical committee. Written consent was obtained prior to the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 20 each. Group I patients received pre-treatment with lignocaine (20 mg of 2% solution diluted to 2 ml with distilled water), and group II patients received pre-treatment with methylprednisolone sodium succinate (125 mg diluted into 2 ml of distilled water).

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Pain on propofol injection was evaluated by four-point verbal rating scale. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of patients

Total- 40		
Groups	Group I (lignocaine)	Group II (methylprednisolone)
Number	20	20

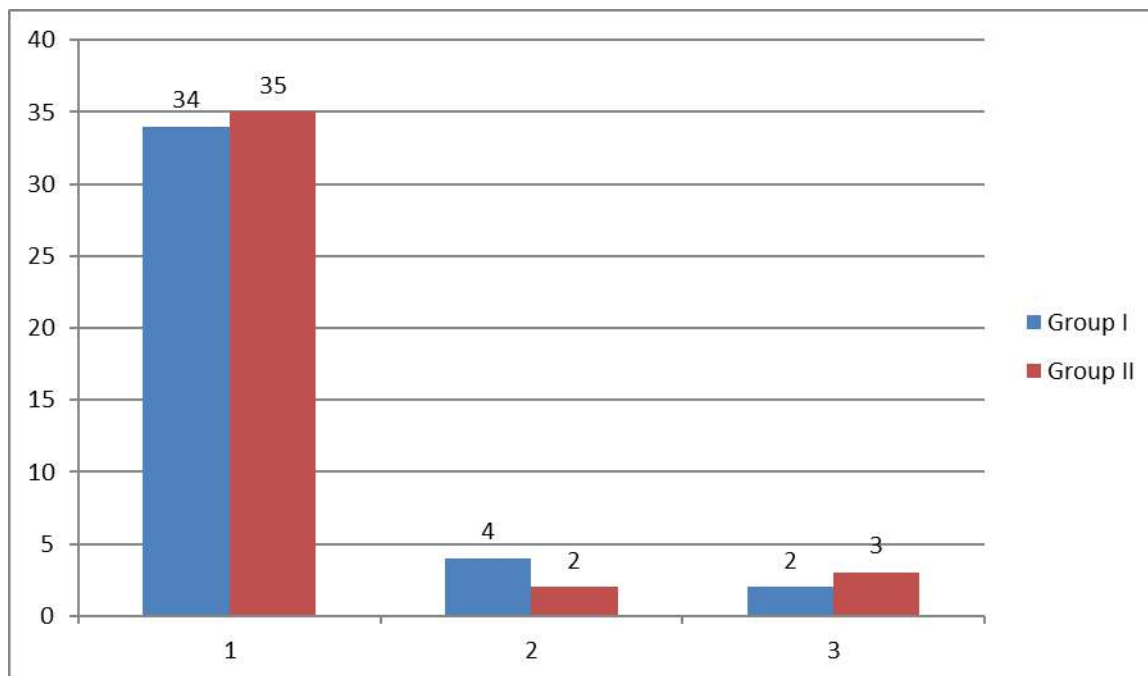
Table I shows that group I patients received lignocaine and

group II patients received methylprednisolone sodium succinate.

Table II: Comparison of pain score in both groups

Pain score	Group I	Group II	P value
1	34	35	0.5
2	4	2	0.08
3	2	3	0.4

Table II, graph I shows that 34 patients in group I and 35 in group II had pain score 1, 4 in group I and 2 in group II had 2 and 2 in group I and 3 in group II had score 3. The difference was significant ($P < 0.05$).



Graph I: Pain score in both groups

Discussion

Propofol is used intravenously for the induction and maintenance of anaesthesia. The main disadvantage of propofol is pain on injection, however it is a popular induction agent for ambulatory surgery as it provides smoother induction and faster recovery than other agents such as thiopental, which is considered to be the standard induction agent [6]. Widely available propofol is in long chain triglyceride (LCT) emulsion. Commonly used LCT emulsion of propofol is Diprivan (AstraZeneca). Another preparation of propofol is available in a combination of medium chain triglyceride (MCT) and LCT emulsion. Commonly available MCT/LCT propofol emulsions are Propoven (Fresenius) and Propofol-Lipuro (B Braun) [7]. The present study was conducted to compare lignocaine with methylprednisolone in reducing pain of propofol injection.

In present study, group I patients received lignocaine and group II patients received methylprednisolone sodium succinate. 34 patients in group I and 35 in group II had pain score 1, 4 in group I and 2 in group II had 2 and 2 in group I and 3 in group II had score 3.

Sumalatha *et al.* [8] conducted a study in which a total of 165 adult patients, scheduled for elective cardiac surgery, were divided into three groups: saline (group S, n = 55),

lignocaine 20 mg (Group L, n = 55) and methylprednisolone 125 mg diluted into 2 ml of distilled water (Group MP, n = 55). Drugs were administered after tourniquet application and occlusion was released after 1 min and 1/4th of the total dose of propofol (2 mg/kg) was administered at the rate of 0.5 ml/s. Pain on propofol injection was evaluated by four-point verbal rating scale. The overall incidence of pain was 70.9% in the saline group, 30.9% in the lignocaine group and 36.4% in the methylprednisolone group. The intensity of pain was significantly less in patients receiving methylprednisolone and lignocaine than those receiving saline.

The mechanism for propofol injection pain is unknown; however it could be due to irritation of the endothelium, osmolality differences, unphysiological pH and the activation of pain mediators. The immediate vascular pain on propofol injection is attributed to direct irritation of the drug by stimulating the venous nociceptive receptors or free nerve endings involving myelinated Aδ fibres. The delayed pain of injection has a latency of 10–20 seconds mediated by activation of kallikrein–kinin system [9].

Use of lignocaine with propofol is almost a norm since many years and hence perhaps maximum number of clinical trials was with lignocaine either alone or in combination with other drugs. The most effective dose for lignocaine

with venous occlusion was 60 mg in one study, whereas 40 mg is the most commonly used dose when premixed with 200 mg of propofol. Venous occlusion with lignocaine is an effective method in relieving propofol induced pain ^[10].

Conclusion

Methylprednisolone found to be equally effective in reducing pain of propofol injection when compared with lignocaine.

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