Original Article

Effect of Intravenous Lignocaine in Attenuating Dexamethasone Induced Perineal Pruritus During Induction of Anesthesia

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Abstract

Background: *Intravenous dexamethasone may produce perineal pruritus in some patients when administered as premedicant before induction of anesthesia.* ***Objectives of study:*** *This randomized, double-blind study was done to evaluate the efficacy of pretreatment of lignocaine on the incidence and severity of dexamethasone-induced perineal pruritus.* ***Materials and methods:*** *100 patients were enrolled in this study and allocated randomly into two equal groups. Then, patients received intravenous medications in the following sequence before induction of anesthesia: in group I, injection lignocaine 1mg/kg diluted in 5 ml normal saline and in group II, 5 ml normal saline (placebo group), then one minute later, intravenous dexamethasone sodium phosphate 10 mg was given in all groups in 3 seconds and was observed the patient's response about perineal pruritus. The severity of perineal pruritus was graded based on the visual analog scale (VAS) as none (VAS 0), mild (VAS 1-3), moderate (VAS 4-6), or severe (VAS 7-10), and recorded the incidence and severity of perineal pruritus. Then general anesthesia was induced and continued as usual.* ***Results:*** *In terms of demographic data, the results of this study showed that there was no significant difference between patients in both groups (P>0.05). Overall incidence and severity of perineal pruritus in lignocaine group was significantly less, when compared with placebo group (P<0.05).* ***Conclusion:*** *It can be concluded that pretreatment with 1mg/kg intravenous lignocaine may effectively reduce the incidence and severity of dexamethasone induced perineal pruritus.*

Keywords: *Dexamethasone, Lignocaine, Perineal pruritus*

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Introduction

Dexamethasone is a synthetic glucocorticoid with minimal mineralocorticoid activity, widely used before general anesthesia induction to prevent postoperative nausea and vomiting (PONV),[1-4] pain on propofol injection (POPI),[5] postoperative shivering,[6] postoperative sore throat due to endotracheal tube[7,8] and also used to reduce fentanyl-induced cough.[9] Preoperative dexamethasone improves postoperative quality of recovery and opioid consumption.[10]

A number of studies have found that a pre-induction bolus dose of dexamethasone sometimes causes perineal pain and pruritus.[11-15] The incidence of perineal pruritus varies between 25% to 100%, depending on the dose of dexamethasone.[11,12,15-17] Dexamethasone-induced perineal pruritus is common but has not been viewed as a serious drug problem. However, perineal pruritus is not always brief and benign. It may require immediate intervention, and may be associated with undesirable increase of unpleasant experience in the operation room. Prevention of dexamethasone-induced perineal pruritus in such situations is of great importance. Previous studies have shown that dexamethasone-induced perineal pruritus can be alleviated by pretreatment with fentanyl (1mcg/kg) and lignocaine.[18,19]

The mechanism of perineal pruritus caused by dexamethasone phosphate is not known. Some studies speculate that perineal pruritus could be related to the phosphate ester of the corticosteroid since perineal irritation has been described with hydrocortisone-21-phosphate sodium and prednisolone phosphate.[13,14]

Topical local anesthetics such as lignocaine have been shown to have anti-pruritic properties.[20] Perineal pruritus may be associated with neurotransmitter mechanisms, where the

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neurotransmitter may be phosphate itself or be stimulated by phosphate. It is also speculated that dexamethasone may participate in the pathogenesis of pruritus through activate the sodium channels in peripheral unmyelinated C-fiber polymodal afferents within superficial layers of skin and mucous membrane.[20] Using lignocaine may result in slow release of neurotransmitters.

This randomized controlled study was designed to observe the effects of intravenous lignocaine on dexamethasone-induced perineal pruritus during induction of general anesthesia.

Materials and methods

This study is a randomized controlled trial conducted from September 2017 to December 2017 in National Institute of ENT Dhaka. The inclusion criteria were American Society of Anesthesiologists (ASA) physical status I and II, need for general anesthesia, not being addicted to any drugs, being 20-50 years of age. The exclusion criteria was diabetes mellitus, impaired glucose tolerance, peptic ulcer disease, endocrine disorder, morbid obesity (BMI>30)], impaired hepatic or renal impairment, cardiac ischemia, pulmonary, neuromuscular or metabolic diseases and pregnancy. All participants provided written informed consent to participate in the study.

Preoperative evaluation included examination of medical history, physical and upper airway examination. A complete blood test, renal function tests, liver function tests, chest x-ray and electrocardiogram were conducted on all patients. The patients were allocated into either of the two equal groups group I (lignocaine group) and group II (placebo group). Noninvasive blood pressure, heart rate, electrocardiogram and pulse oximeter were applied after patients arriving in operating room and maintained throughout the surgery. A 20 G cannula was inserted to the dorsum of left hand of the patient and Ringer's Lactate solution was started at a rate of 100ml/hour.

After 3 minutes pre-oxygenation, patients received intravenously anesthesia induction as the following sequence of medications: in group I, injection lignocaine 1mg/kg diluted in 5 ml normal saline and in group II, 5 ml normal saline (placebo group), then one minute later, intravenous dexamethasone sodium phosphate 10 mg was given in all groups in 3 seconds and was observed the patient's response about perineal pruritus for 30 seconds. The severity of perineal pruritus was graded based on the visual analog scale (VAS) as none (VAS 0), mild (VAS 1-3), moderate (VAS 4-6), or severe (VAS 7-10), and recorded the incidence and severity of perineal pruritus. Then patient was given propofol and succinylcholine, intubated and anesthesia was maintained as usual.

Date was summarized as mean ± SD. Unpaired t-test was applied for quantitative data and Chi-square test for qualitative data. P value < 0.05 was taken as significant.

Results

There was no significant difference in terms of age, body weight, sex and ASA status between the groups (Table I). In lignocaine group 5 (10%) out of the 50 patients had perineal pruritus, whereas 22 (44%) out of the 50 patients had perineal pruritus in placebo group (P<0.05). Mild perineal pruritus was lower number of patients in lignocaine group when compared with placebo group (3 versus 13; P<0.05). Moderate perineal pruritus was also lower number of patients in lignocaine group when compared with placebo group (2 versus 9; P<0.05) and there was no severe perineal pruritus in any of the two groups (Table II). The baseline values of systolic and diastolic blood pressure and heart rate in both groups were similar and there was no any adverse effect.

Table I: Comparison of demographic data between the groups

Parameter	Group I (Lignocaine group) n=50	Group II (Placebo group) n=50	p value
Age in year (mean±SD)	37.2±7.3	38.3±6.7	p>0.05
Weight in kg (mean±SD)	61.3 ±7.6	62.6 ±8.4	p>0.05
Sex (M/F)	26/24	27/23	p>0.05
ASA status I/II	46/4	45/5	p>0.05

Table II: Incidence and severity of perineal pruritus

Perineal prurit	Group I (Lignocaine group) n=50	Group II (Saline group) n=50	p value
Incidence	5 (10%)	22 (44%)	p<0.05
Severity			
None (VAS 0)	45 (90%)	28 (56%)	p<0.05
Mild (VAS 1-3)	3 (6%)	13 (26%)	p<0.05
Moderate (VAS 4-6)	2 (4%)	9 (18%)	p<0.05
Severe (VAS 7-10)	0	0	-

Discussion

Present study showed that intravenous lignocaine suppresses dexamethasone-induced perineal pruritus during anesthesia induction. Since year 2000, dexamethasone was widely used to prophylaxis or treatment of postoperative nausea and vomiting.[21] Dexamethasone-induced perineal pruritus is commonly observed during induction of anesthesia.[22]

Singh et al.[23] performed a small prospective study in which 60 patients experienced pruritus in many patients after administration of intravenous dexamethasone sodium phosphate, he also observed perineal itching or excruciating pain in patients receiving dexamethasone is more common in female patients with incidence more than 55%. The findings of present study shows, in lignocaine group 5 (10%) out of the 50 patients had perineal pruritus, whereas 22 (44%) out of the 50 patients had perineal pruritus in placebo

group (P<0.05). Mild perineal pruritus was lower number of patients in lignocaine group when compared with placebo group (3 versus 13; P<0.05). Moderate perineal pruritus was also lower number of patients in lignocaine group when compared with placebo group (2 versus 9; P<0.05) and there was no severe perineal pruritus in any of the two groups.

Wang J et al.[19] had a study on suppression of dexamethasone induced perineal pruritus during anesthesia induction by intravenous lignocaine. He found 9% patients had perineal pruritus in lignocaine 1mg/kg group and 40% patients experienced pain in saline group, the result is similar to present study.

Gu CY et al.[15] had a study on dexamethasone induced perineal pruritus and suggests that the dilution of dexamethasone may effectively reduce the incidence of perineal pruritus.

Conclusion

In conclusion, present study suggests that pretreatment with 1mg/kg intravenous lignocaine may effectively reduce the incidence and severity of dexamethasone induced perineal pruritus before induction of anesthesia.

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