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

Introduction

Dexamethasone is a synthetic glucocorticoid with minimal mineralocorticoid activity, widely used before general anesthesia induction to prevent postoperative nausea and vomiting (PONV)¹⁰,¹¹ pain on propofol injection (POPI),¹¹ postoperative shivering,¹² postoperative sore throat due to endotracheal tube,¹³ and also used to reduce fentanyl-induced cough.¹⁴ Preoperative dexamethasone improves postoperative quality of recovery and opioid consumption.¹⁵ A number of studies have found that a pre-induction bolus dose of dexamethasone sometimes causes perineal pain and pruritus.¹⁵-¹⁷ The incidence of perineal pruritus varies between 25% to 100%, depending on the dose of dexamethasone.¹⁰,¹²,¹³-¹⁷ 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.¹⁵,¹⁹ 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.¹⁵,¹⁶ Topical local anesthetics such as lignocaine have been shown to have anti-pruritic properties.¹⁶ Perineal pruritus may be associated with neurotransmitter mechanisms, where the
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. 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
intravenous 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.

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. Dexamethasone-induced perineal pruritus is
commonly observed during induction of anesthesia. Singh et al.21 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 exacerbating
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
Mild perineal pruritus was lower in the lignocaine group when compared to the placebo group (3 versus 13; P<0.05). Moderate perineal pruritus was also lower in the 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. had a study on the 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. 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.

Acknowledgement
We are extremely grateful to Prof. Dr. Mahmudul hassan, Professor of Department of ENT, Director, National Institute of ENT, Dhaka. It is our great pleasure to express our regards to all the staffs of Department of Anesthesiology of National Institute of ENT, Dhaka for their endless support during the study period.

References


