

## Intravenous Dexamethasone Causes Perineal Pain and Pruritus

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### Abstract

**Background:** Dexamethasone has been used for postoperative nausea and vomiting (PONV). Single dose dexamethasone in premedication does not cause any side effect. During our previous published study conducted on effect of dexamethasone for PONV, an unusual side effect of excruciating pain and perineal itching immediately following administration of this drug was observed. The present prospective incidence study was conducted in tertiary hospital of East Delhi, India to find out incidence and management of severe perineal pain and perineal pruritus immediately post-administration of dexamethasone.

**Methods:** 30 ASA 1 or 2 males (Group 1) and 30 ASA 1 or 2 females (Group 2) patients were selected to find incidence and intensity of pain after dexamethasone administration in both sexes posted for routine ophthalmologic, ENT and gastrointestinal surgeries. An intravenous cannula (18 G) was inserted ringer lactate fluid was started. Dexamethasone in dose of 0.15 mg/kg was administered (after dilution with normal saline to 5 ml volume) along with i.v. fluid. Immediately patients were asked for any discomfort, pain/pruritus. Onset of pain & duration of pain was noted. Intensity of pain was assessed with 11 point Numeric pain scale and Simple descriptive pain intensity scale and Chi-Square test was applied with P value of <0.05 was considered as significant. Any other adverse effect was noted, if any.

**Results:** Seventy percent male patients suffered no pain as compared to 43.3% female patients ( $p < 0.05$ ). Only 30% male patients had suffered pain as compared to 56% female patients with similar perineal pruritus incidence and similar mean pain/pruritus onset time. The mean duration of persistence of pain was 23 seconds and 29 seconds in group 1 and 2 respectively.

**Conclusion:** Perineal itching or excruciating pain in patients receiving dexamethasone is more common in female patients with incidence more than 55%. The pain subsides on its own without any treatment.

**Keywords:** Dexamethasone; Perineal pain; Pruritus

Dexamethasone is a synthetic glucocorticosteroid with minimal mineralocorticoid activity, utilized frequently in perioperative setting including prophylaxis against postoperative nausea and vomiting (PONV), reduction of airway and cerebral edema and alleviating of acute & chronic pain [1]. Dexamethasone has been used for postoperative nausea and vomiting (PONV) in patients undergoing various surgical procedures (especially ophthalmologic and otolaryngological patients) and who undergo chemotherapy for different types of carcinoma [2]. Although regular dexamethasone therapy for various indications may produce side effects but single dose dexamethasone as premedicant does not cause any side effect [1,3,4].

It is interesting to note that Intravenous dexamethasone may produce perineal pain and perineal pruritus in some patients when administered as premedicant in preoperative period [5]. Very few studies have mentioned about this finding and the incidence observed is 25-100% [4].

With this thought, a prospective incidence study was conducted to find out the incidence and management of severe pain due to administration of dexamethasone.

### Material and Methods

After hospital ethics committee approval and obtaining written informed consent 60 ASA I & 2 patients were selected. The study was conducted in tertiary hospital and Medical college of East Delhi, India (University College of Medical Sciences). The patients were allocated to two groups of 30 patients each. Group 1 comprised 30 male patients and group 2 included 30 female patients, who were scheduled for

routine ophthalmologic, ENT and gastrointestinal surgeries. Patients taking regular analgesics or sedatives; suffering from acute or chronic pain syndromes; or having history of hypersensitivity to propofol or dexamethasone and patients having contraindications to the use of dexamethasone were excluded. Informed consent was obtained from all the participants and no premedication was administered in the morning of surgery. In the operation theatre, after instituting monitoring, an 18 gauge intravenous cannula was inserted without local infiltration on the dorsum of left hand of the patient and ringer lactate infusion was started. Dexamethasone sodium phosphate (0.15 mg/kg) (Decadron<sup>®</sup>) was administered (after dilution with normal saline to a volume of 5 ml) along with i.v. fluid. The patient was immediately enquired for any discomfort, pain or pruritus in any part of body. When the pain subsided (as reported by the patient), the other premedication drugs were administered and induction of anaesthesia was done with propofol 2.5 mg/kg. The time of onset of pain and duration of pain was

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noted in all the patients of either group. The time of onset was defined as a time when patient reported the pain or pruritus immediately after complete administration of drug and duration of pain was described as the time till the patient starts feeling comfortable after administration of dexamethasone. The intensity of pain was assessed with 11 point Numeric pain scale (NPS) (0-10 cm pain score) and Simple descriptive pain intensity scale (SDP) (no pain, mild pain, moderate pain and Severe pain). P value of <0.05 was considered as significant. A Chi-Square test was applied for defining statistically significant pain. Any other adverse effect like appearance of erythema, rashes or induration was noted.

## Results

Table 1 shows that the two groups were similar with respect to age, weight and height.

Seventy percent male patients suffered no pain as compared to 43.3% female patients (p<0.05). Only 30% male patients had suffered pain as compared to 56% female patients. Perineal pruritus incidence was similar in both groups (16.6% vs 23.3%) although it was individually significant (Table 2).

The mean time of onset of pain/pruritus was 8 seconds in group 1 and 9 seconds in group 2. The mean duration of persistence of pain/pruritus was 23 seconds and 29 seconds in group 1 and 2 respectively (Table 3).

PARAMETERS	GROUP 1 (n=30 males)	GROUP 2 (n=30 females)
Mean Age(years) ±SD	29±2.3	28±.1.4
Mean Weight(Kg) ± SD	49.8± 4.1	50.2 ±2.8
Mean Height(cm) ± SD	160± 2.0	168±1.2

Table 1: Shows that the two groups were similar with respect to age, weight and height.

Perineal Pain	GROUP 1 (n=30 males)		GROUP 2 (n=30 females)	
	No. of Patients	Percentage	No. of Patients	Percentage
No Pain (VAS=0 cm)	21*	70%	13	43.3%
Mild (VAS=1-3 cm)	2	6.7%	5*	16.7%
Moderate (VAS=4-6 cm)	2	6.7%	4	13.3%
Severe (VAS=7-10 cm)	5	16.7%	8*	26.7%
Perineal Pruritus	5*/30	16.7%	7*/30	23.3%
Any other side effect	0	0	0	0

\* P<0.05

Seventy percent male patients suffered no pain as compared to 43.3%female patients (p<0.05). Only 30% male patients had suffered pain as compared to 56%female patients. Perineal pruritus incidence was similar in both groups (16.7% vs 23.3%) although it was individually significant (Table 2).

Table 2: shows intensity of pain with NPS 11 point score and SDP.

PARAMETERS	GROUP 1 (n=30 males)	GROUP 2 (n=30 females)
Mean Onset(sec) ± SD	8±0.2	9±.1.4
Mean Duration(sec)± SD	23± 1.1	29 ±1.8

The mean time of onset of pain/pruritus was 8 seconds in group 1 and 9 seconds in group 2. The mean duration of persistence of pain/pruritus was 23 seconds and 29 seconds in group 1 and 2 respectively (Table 3).

Table 3: Mean Onset and Mean Duration of Pain/Pruritus.

## Discussion

The three most commonly used corticosteroid that are administered in emergency conditions are hydrocortisone, 5 methyl prednisolone, and dexamethasone [6]. Occasionally, appearance of genital, perineal, anorectal pruritus has been reported with use of hydrocortisone or dexamethasone [7]. Dexamethasone has been used frequently in patients with head injuries or pre- chemotherapy [8]. Since year 2000, its use has further extended to prophylaxis or treatment of post operative nausea and vomiting [9,10].

Perron et al. [3,11] performed a small prospective study in which 20 patients experienced pruritus in many patients after administration of intravenous dexamethasone sodium phosphate. The authors further tried to find the association between appearance of pruritus and female sex but concluded the study with recommendation that steroid should be diluted in 50 ml saline and must be administered in 5-10 minutes. Their results are also similar to the present study where the incidence of perineal pruritus was more in group 2 (female patient) and it was statistically significant (p<0.05).

The pharmacological mechanism explaining this phenomenon remains poorly understood, but could be related to the phosphate ester of the corticosteroid since perineal irritation has been described with hydrocortisone-21-phosphate sodium and prednisolone phosphate [11,12]. No detailed explanation is mentioned even on extensive med-line search. It has been explained that the pathogenesis of perineal pruritus /pain has been may be related to corticosteroid phosphate esters such as the dexamethasone sodium phosphate (as used in our cases) to cause perineal pain and irritation. Both the incidence and severity may increase as the organic phosphate content of the injection increases. The lesser duration of pain might be due to hydrolysis of compound to phosphate ions and dexamethasone. However, the pathophysiology of this rare side-effect still remains unknown and further research is required.

Fortunately, this adverse effect diminishes on its own as the compound is hydrolyzed and it has not produced any postoperative prolonged effect.

To conclude dexamethasone used for prophylaxis and treatment of PONV may cause perineal pruritus/pain of variable intensity in awake patients. It is more common in female patients. This pain or pruritus can be diminished or even abolished by giving dexamethasone diluted in 50 ml of fluid over five to ten minutes. Another method of abolishing this discomfort is to administer dexamethasone after induction of anaesthesia. The pharmaceutical preparation of non phosphate containing dexamethasone may also be recommended.

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