

## The incidence rate of perineal pruritus after intravenous administration of dexamethasone sodium phosphate

Imad Noaman Shareef:

Dept. of Pharmacology, College of Medicine, Tikrit University

### Abstract

The cross sectional study was determine the incidence rate of perineal pruritus after administered dexamethasone intravenously. The study was performed on 100 patients in age between 20-55 years (50 males and 50 females) in Tikrit city from 2-1-2014 till 2-1-2017

Result: The study was show the incidence rate of perineal pruritus in female is 80% and 60% in male

Conclusion: These study was record the transient pruritus following administration of intravenous dexamethasone sodium phosphate is a common.

**Key words:** Patients, dexamethasone sodium phosphate ampoule 4mg/ml.

### Introduction

Dexamethasone is a synthetic glucocorticoid with minimal mineralocorticoid activity (1). Its penetrate cells & bind to high affinity cytoplasmic receptor protein which lead a structural change occurs in steroid receptor complex that allows its migration into the nucleus and binding to specific sites on the chromatin which transcription of specific m-RNA lead to regulation of protein synthesis (2). It is metabolized by the liver microsomal oxidizing enzymes. The metabolites are conjugated to glucuronic acid or sulfate and the

products are excreted by the kidney (3).

Dexamethasone actions on carbohydrate favors gluconeogenesis, on protein is catabolism and on fat is stimulated lipolysis (4). It's also increase resistance to stress, and also decrease eosinophils, basophils, monocytes and lymphocytes and increase hemoglobin, erythrocyte and platelets. It also has anti-inflammatory actions due to lowering and inhibition of lymphocyte and macrophage, also due to inhibition of phospholipase A2 with interference in mast cell

## The incidence rate of perineal pruritus after intravenous administration of dexamethasone sodium phosphate

degranulation. It is increased gastric acid and pepsin secretion, bone loss, influence mental state and myopathy (5).

The adverse effect of long term used are decreased growth in children, osteoporosis, increase appetite, hypertension, glaucoma, impaired wound healing, increase risk of infection, emotional disturbance (euphoria and depression), peripheral edema, central distribution of body fat, increased hirsutism, hypokalemia, increased frequency of cataracts, hyperglycemia may develop and lead to diabetes mellitus, and suppression of hypothalamo-pituitary-adrenal cortex (6).

The following diseases are contraindications in used of dexamethasone which are peptic ulcer, diabetes mellitus, hypertension, congestive heart failure, renal failure, osteoporosis, tuberculosis, viral and fungal infection, herpes simplex keratitis, epilepsy and psychosis (7,8).

## Material and methods

This work was conducted in Tikrit Teaching Hospital and Salahudeen General Hospital, the work carried from January-2014 to January 2017. The study is involved 100 patients (50 females and 50 males) with age range between 20-55 years. This material involve perineal allergy after administration dexamethasone sodium phosphate intravenously. Comparison were performed by using mean, incidence rate and chi square test.

## Results

The study was designed to see incidence rate of perineal pruritus after intravenous injection of dexamethasone sodium phosphate in patients (50 females and 50 males). The incidence rate of perineal itching in male is 60%, in female is 80% and in both sex is 70% which means the incidence rate in female more than male.

Table (1): The percentage of incidence rate of perineal pruritus in female, male and both sexes.

sex	mean	percentage	t-test
Male	0.6	60%	7.575
Female	0.8	80%	23.07
Both sex	0.7	70%	16.26

## Discussion

This study is recorded the incidence rate of perineal itching after intravenous injection of dexamethasone sodium monophosphate. Perron et al, performed a small prospective study in which 20 patients experienced pruritus in many patients after administration of intravenous dexamethasone sodium phosphate. Their results are also similar to the present study where the incidence rate of perineal pruritus was

more in female patient and it was statistically significant ( $p < 0.05$ ) (9,10). Previous studies have shown that the incidence of dexamethasone-induced perineal pruritus varies between 25% and 100% (Kuczkowski 2004; Sanchez Ortega et al. 2005; Taleb et al. 1988) (11).

In a study by Singh et al. (2011), 43% of patients were perineal pruritus after receiving 0.15 mg/kg dexamethasone via a peripheral intravenous line (12).

## The incidence rate of perineal pruritus after intravenous administration of dexamethasone sodium phosphate

Some studies speculate that perineal pruritus could be related to the phosphate ester of the dexamethasone (Neff et al. 2002; Perron et al. 2003; Taleb et al. 1988; Thomas 1986) (13). The effect of gender on the incidence of perineal pruritus was already seen in previous studies (Rewari et al. 2010; Singh et al. 2011) (14). In our daily clinical practice, we have observed that females had a higher incidence rate of dexamethasone-induced perineal pruritus. In our study, we found that the incidence rate was higher in females than in males (15,16). The pharmacological mechanism explaining this phenomenon remains poorly understood, but could be related to that the pathogenesis of perineal pruritus has been may be related to corticosteroid phosphate esters such as the dexamethasone sodium phosphate to cause perineal irritation [10,17]. Both the incidence and severity may increase as the organic phosphate content of the injection increases (18), also may attributed to action on neurotransmitters. The neurotransmitter may be phosphate itself or be stimulate by phosphate (18).

### Conclusions

Transient pruritus following administration of intravenous hydrocortisone sodium phosphate is a common side effect that affects younger people and is associated with bolus administration.

### Recommendation

The further research is required to the pathophysiology of this rare side-effect.

### References

- 1- Richard A. Harvey. 5<sup>th</sup> edition pharmacology. 2012, 331-337.
- 2- Don A. Ballington, Mary M. Laughlin. Third edition pharmacology. 2008, 406-408.
- 3- S D Seth, Vimlesh Seth. Textbook of pharmacology. 2009, 8: 49-62.
- 4- Thomas VI. More on dexamethasone induced perineal irritation. 1986, 314:1643-1644.
- 5- Fardet L, Flahault A, Kettanaeh A, et al. Corticosteroid –induced clinical adverse events: frequency, risk factors and patient’s opinion. 2007, 157:142-148
- 6- Huscher D, Thiele K, Gromnica-Ihle E, et al. Dose-related atterns of glucocorticoid-induced side effects. 2009, 68:1119-1124.
- 7-Singh M, Mohta M, Sethi AK, Tyagi A. Efficacy of dexamethasone pretreatment for prevention of propofol injection pain. 2005, 22: 888-890.
- 8-Habib AS, Gan TJ. Evidence-based management of postoperative nausea and vomiting: a review. 2004, 51: 326-341.
- 9- Neff SP, Stapelberg E, Warmington A. Excruciating perineal pain after intravenous dexamethasone. 2002, 30: 370-371.
- 10- Crandell JT. Perineal prurites after administration of intravenous dexamethasone. 2004, 5:398-399.
- 11- HenziI, Walder B, Tramèr MR. Dexamethasone for prevention of Postoperative nausea and vomiting: a quantitative systemic review. 2000, 90:186-194.
- 12- Perron G, Dolbec P, Germain J, Béchar P. Perineal prurities after i.v. dexamethasone administration. 2003, 50:749-750.
- 13-Taleb N, Geahchan N, Ghosn M, Brihi E, Sacre P. Vular pruritus after high dose dexamethasone. 1998, 24: 495.
- 14- Mujais, S.K., M.A. Chekal, W.J. Jones, J.P.HAYSLETT, and A.I.Katz. Regulation of renal Na-K-ATPase I

**The incidence rate of perineal pruritus after intravenous administration of dexamethasone sodium phosphate**

the rat. Role of the natural mineralo- and glucocorticoid hormones. 1984, 73:13-19.

15- Wang JJ, Ho ST, Tzeng JI, Tang CS. The effect of timing of dexamethasone administration on its efficacy as a prophylactic antiemetic for postoperative nausea and vomiting. 2000, 91:136-139.

16- Kuczkowski KM. perineal pruritis and dexamethasone. 2004, 59:308.

17- Novak E, Di Santo AR, Seckman CE, Elliott G, Lee JG, Stubbs SS. The clinical pharmacology of methylprednisolone sodium phosphate. 1997, 17:324-333.

18- Fardet L, Flahault A, Kettanaeh A. corticosteroid-induced clinical adverse events. 2007, 157:142-148.