

## MULTIPLE ADVERSE EFFECTS OF BETAMETHASONE USED AS SELF-MEDICATION: A CASE REPORT

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### ABSTRACT

Corticosteroids are commonly prescribed as anti-inflammatory, immunosuppressant and replacement therapy. Adverse effects of corticosteroids are widely recognized. However, due to easy availability and relief offered, they are identified as one of the oral drugs abused by the patients. Here, we describe a case of multiple adverse effects with long-term use of corticosteroid in a single patient used as self-medication. Hypothalamic pituitary adrenal axis suppression, hypertension, osteopenia, hypothyroidism, cushingoid features, lymphocytopenia were the adverse effects, which were suspected to be induced by oral betamethasone that was prescribed initially for exacerbation of intermittent breathlessness in a patient suffering from chronic obstructive pulmonary disease.

**Keywords:** Betamethasone, Hypertension, Hypothyroidism, Osteopenia and hypothalamic pituitary adrenal axis suppression.

### INTRODUCTION

Glucocorticoids are widely used in the treatment of patients with chronic inflammatory diseases. They are presumed to act due to their anti-inflammatory activity [1]. However, wide complications have been observed with glucocorticoids treatment. They are gastritis, ulcers, increased appetite, pancreatitis, headache, psychiatric disturbances, anxiety, hypertension, glaucoma, posterior sub-capsular cataracts, sodium retention, fluid retention, hypokalemic, myopathy, osteoporosis, hyperlipidemia, glucose intolerance, weight gain, hirsutism, increased sweating [2]. Hence, these group of drugs need close monitoring when administered on long term basis.

Here, we report a case of obstructive airway disease who presented with multiple adverse effects. They are hypothalamic pituitary adrenal (HPA) axis suppression, hypertension, osteopenia, hypothyroidism, Cushingoid features, lymphocytopenia induced by chronic use of betamethasone as self-medication.

### CASE REPORT

A 65-year-old female patient case of chronic obstructive pulmonary disease weighing 73 kg presented to the pulmonary medicine department on May 16, 2014 with exacerbation of breathlessness. Patient had worsening of respiratory symptoms since 1 year. Patient was non-alcoholic, non-smoker and was a home-maker exposed to biomass fuel for many years. Her family history revealed that her father was hypertensive at the age of 75 years, no other significant history. Patient medication history provided information that the physician in rural Bengaluru had prescribed her betamethasone 0.5 mg twice daily for 5 days for breathlessness a year ago. Since there was relief, the patient continued consuming the same medication for past 1 year 2-3 times a day as self-medication.

The patient was hospitalized for further management. On examination she was obese, weighing 73 kg, with Cushingoid features, centrally distributed fat, bilateral pedal edema, puffiness of the face, buffalo hump. Hence, patient was diagnosed to have exogenous Cushing's syndrome. Patient had persistent raised blood pressure. Our patient did not have cataract, psychiatric disturbances (Table 1).

On May 17, 2014 two-dimensional echo showed ejection fraction as 65%. Pulmonary function test showed moderate restriction, small airway narrowing. Osteoporosis was seen on dexa bone scan.

In our patient, the adverse drug reaction was in the form of:

1. Cushing's syndrome
2. HPA axis suppression
3. Hypertension
4. Hypothyroidism
5. Osteopenia
6. Lymphocytopenia.

Specialist opinion from an endocrinologist was taken. The following treatment was initiated:

- Single injection of zolindronate (zolindroic acid) 5 mg/100 ml by the intravenous route
- Tablet calcium and vitamin D twice daily for 8 days
- Capsule pantoprazole domperidone sustained release twice daily for 8 days ½ hr before food

**Table 1: Laboratory investigations**

S.No	Laboratory investigation	Laboratory value
1	Haemoglobin	11 g%
2	White blood cells	10,000 cell/cumm
3	Differential count	
	Neutrophils	50%
	Lymphocytes	22.4% (low)
	Basophils	0.2%
	Monocytes	3.7%
	Eosinophils	6.1%
4	Platelet count	363 10 <sup>6</sup> /L
5	Mean platelet volume	7.7 fL
6	Cortisol	0.23 mg/dL (low)
7	TSH	9.86 mIU/L (high)
8	Serum calcium	9.3 mg/dL (low)
9	Phosphorous	4.8 mEq/L
10	Sodium	142 mEq/L
11	Chloride	109 mEq/L

TSH: Thyroid - stimulating hormone

- Tablet stamlo (amlodipine) 10 mg 1-0-0 × 8 days
- Tablet thyronorm (thyroxine) 25 µg once daily
- Tablet tayo 60 K (cholecalciferol) every Monday ×8 weeks
- Tablet hisone 10 mg-0-5 mg - gradually to be tapered off
- Patient was discharged on May 25, 2014 in a stable condition.

## DISCUSSION

In our case, the physician had prescribed oral corticosteroids for exacerbation with intermittent breathlessness for a short duration. But the patient also stated that for past 1 year she continued the same intervention as self-medication.

Osteoporosis is commonly reported complication on long-term steroid use. In this patient, bone densitometry demonstrated osteoporosis with high-risk factor for fracture.

HPA suppression is reported with inhaled steroids. However, there are some reports with topical use. Our literature search revealed very few reports of HPA suppression with oral use [3].

The ability of inhaled glucocorticoids to suppress the HPA axis and cause features of Cushing's syndrome has been known for several years. Similar condition is reported in our case also but with oral betamethasone [4-7].

Although it may be logical to reason that glucocorticoids increase renal salt absorption, resulting in an expansion of the extracellular fluid volume and hypertension, this rationale is not supported by data [8].

Previous studies have shown that glucocorticoids increase cardiac output [9]. Goodwin *et al.* demonstrated the importance of the glucocorticoid receptor in the arteriolar smooth muscle cells in the acute generation of hypertension by glucocorticoids [10].

Corticosteroids alter the hematological parameters such as a decrease in lymphocytes, eosinophils, monocytes and basophils [11]. It is due to the result of their movement from the vascular bed to lymphoid tissue. Laboratory findings revealed that the patient had lymphocytopenia, but eosinophil was high. Monocytes and basophils were within limits.

Glucocorticoids have long been known to affect serum thyroid-stimulating hormone levels in humans [12].

## CONCLUSION

This adverse effect seems to have occurred due to poor communication by the prescriber to the patient about hazards of this medication. It is also an error on the part of patient to self-medicate without consulting the physician. This case report warns us the need for creating awareness about adverse effects of drugs among health care professionals and consumers.

## REFERENCES

1. Boushey HA. Drugs used in asthma. In: Katzung BG, Masters SB, Trevor AJ, editors. Basic and Clinical Pharmacology. 11<sup>th</sup> ed. New York: Tata McGraw-Hill; 2009. p. 347.
2. Rubin B, Palestine AG. Complications of corticosteroid and immunosuppressive drugs. *Int Ophthalmol Clin* 1989;29(3):159-71.
3. Jasani KM, Boyle JA, Dick WC, Williamson J, Taylor AK, Buchanan WW. Corticosteroid-induced hypothalamo-pituitary-adrenal axis suppression. Prospective study using two regimens of corticosteroid therapy. *Ann Rheum Dis* 1968;27(4):352-9.
4. Niitsuma T, Okita M, Sakurai K, Morita S, Tsuyuguchi M, Matsumura Y, *et al.* Adrenal function as assessed by low-dose adrenocorticotropic hormone test before and after switching from inhaled beclomethasone dipropionate to inhaled fluticasone propionate. *J Asthma* 2003;40(5):515-22.
5. Kaliner MA. Pharmacologic characteristics and adrenal suppression with newer inhaled corticosteroids: A comparison of ciclesonide and fluticasone propionate. *Clin Ther* 2006;28(3):319-31.
6. Fardon TC, Lee DK, Haggart K, McFarlane LC, Lipworth BJ. Adrenal suppression with dry powder formulations of fluticasone propionate and mometasone furoate. *Am J Respir Crit Care Med* 2004;170(9):960-6.
7. Barnes NC. The properties of inhaled corticosteroids: Similarities and differences. *Prim Care Respir J* 2007;16(3):149-54.
8. Canalis E. Mechanisms of glucocorticoid action in bone. *Curr Osteoporosis Rep* 2005;3(3):98-102.
9. Baum M, Moe OW. Glucocorticoid-mediated hypertension: Does the vascular smooth muscle hold all the answers? *J Am Soc Nephrol* 2008;19(7):1251-3.
10. Goodwin JE, Zhang J, Geller DS. A critical role for vascular smooth muscle in acute glucocorticoid induced hypertension. *J Am Soc Nephrol*; 2008; 19: 1291-9.
11. Barnes PJ. Pulmonary pharmacology. In: Bruton LL, Lazo JS, Parker KL, editors. Goodman & Gilman's the Pharmacological Basis of Therapeutics. 12<sup>th</sup> ed. New York: McGraw-Hill; 2006. p. 1050.
12. Wilber JF, Utiger RD. The effect of glucocorticoids on thyrotropin secretion. *J Clin Invest* 1969;48(11):2096-103.