



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1461879>Available online at: <http://www.iajps.com>

A Case Study

**BUDESONIDE INDUCED IATROGENIC CUSHING'S  
SYNDROME IN A CHRONIC ASTHMA PATIENT: A CASE  
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Erode, Tamilnadu<sup>3</sup>Principal, Nandha College of Pharmacy, Erode, Tamilnadu**Abstract:**

*Iatrogenic Cushing's syndrome is the most common form of hypercortisolism. Chronic uses of steroids have a lot of serious side effects like Cushing syndrome. Here is a case of 50year old female patients who is suffering from Cushing syndrome caused by chronic use of Budesonide. She is a known case of asthma for past 2-3years and she is taking budesonide. She has complaints of moon face, backache, swelling of limbs, abdominal distension, muscle weakness, breathlessness, cough with expectoration, history of gaining of weight and striae since 3 weeks. Her serum cortisol level is elevated. She was treated with T.Montek LC, antibiotics, inj.hydrocortisone, and syrup.brozedex.*

**Key Words:** *Cushing's syndrome, Hypercortisolism, Budesonide***\*Corresponding author:****Joziya K.J,**

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Please cite this article in press Joziya K.J et al., *Budesonide Induced Iatrogenic Cushing's Syndrome in a Chronic Asthma Patient: a Case Report.*, Indo Am. J. P. Sci, 2018; 05(10).

**INTRODUCTION:**

Cushing syndrome (CS) is a group of clinical features caused by hypercortisolism. CS takes its name from Harvey Cushing who, in 1912, first reported a patient with features of hypercortisolism. CS can be due to endogenous causes such as pituitary tumour, ectopic ACTH production, adrenal tumour or exogenous causes like exogenous steroid administration. The term CS is used to describe the disease from all the causes, whereas Cushing's disease is reserved for cases of pituitary-dependent CS. Exogenous glucocorticoid administration is the most common cause of CS. Endogenous CS is less common.[2] Drug induced hypercortisolism is the most common cause of Cushing's syndrome. Depending upon the level of plasma ACTH, the causes of Cushing syndrome can be broadly divided into two: 1) ACTH dependent CS and 2) ACTH-independent CS. Cushing's syndrome due to exogenous steroid administration is variably described as exogenous Cushing's, steroidinduced Cushing's or iatrogenic CS.[8]

Bronchial asthma (BA) is characterized by airway edema, mucus hyper secretion, and cellular infiltration, along with bronchospasm .[1]This inflammatory reaction can lead to reversible airway obstruction in patients with BA.[2] Systemic corticosteroids are used only for severe exacerbations and for chronic maintenance treatment of patients with severe BA.

Iatrogenic Cushing's syndrome resulting from Long-term use of exogenous glucocorticoids is the most Common cause of Cushing's syndrome. EndogenousCushing's syndrome is broadly classified into acthdependent and ACTH-independent, and is more common in women than in men<sup>3</sup>. The term Cushing's disease is reserved for pituitary dependent Cushing's syndrome.[4] Iatrogenic CS is the most common cause of CS . The development of CS depends on the dose, duration, and potency of the corticosteroids used in clinical practice. Exogenous CS presents with the same signs and symptoms as spontaneous CS. But some features, such as an increase in intraocular pressure, benign intracranial hypertension, cataracts, osteoporosis, aseptic necrosis of the femoral head, and pancreatitis, are more common in iatrogenic than endogenous CS, whereas features like hypertension, hirsutism, and oligomenorrhea/amenorrhea are less prevalent . The clinical manifestations of iatrogenic CS are more striking than that of spontaneous Cushing's, which occurs gradually.

**CASE STUDY:**

A 50 year old female patient was admitted general medicine department of perundururai medical college hospital at perundururai,erode district,fathima have chief complaints of moon face, backache, swelling of limbs, abdominal distension, muscle weakness, breathlessness , cough with expectoration, history of gaining of weight and striaes since 3 weeks.she has known case of asthma for 2-3 years and known case of systemic hypertension. She is on regular treatment with budesonide inhaler for past 2 years.the patient was conscious and well oriented. she is slightly anemic and dyspneic.her vitals were as follows BP-142/80mmhg,PR-112bpm,CVS-S1S2(+),RS-

BAE(+),vocal resonance heard on both sides, B/L wheeze present,CNS-no abnormality present,P/A-Distension(+).

The laboratory investigations shows that the patient have elevated ESR level which is 20mmhr, serum cortisol level was32.2mcg/dl, serum potassium level was reduced to 3.3 mmol/l, and TSH level decreased to 0.078uIU/MI. so based on subjective and objective evidence the patient provisionally diagnosed as Cushing syndrome due to chronic use budesonide with known case of asthma, systemic hypertension and newly diagnosed hypothyroidism. The patient treated with T.Montek LC, antibiotics, syrup.brozedex, Inj.hydrocortisone for severe asthmatic symptoms along with proton pump inhibitors.The budesonide dose is tapered and the serum cortisol level is measured after 3 months during follow up visit which shows reduction in the serum cortisol level. Based on this evidence, the patient is finally diagnosed as exogenous Cushing's syndrome due to chronic use of Budesonide.

**DISCUSSION:**

Cushing syndrome may be due to the endogenous causes such as ectopic Adrenocorticotrophic hormone (ACTH) production, pituitary tumor, and exogenous causes like exogenously administration of corticosteroids. Exogenous Cushing's syndrome is a condition resulting from long-term exposure to therapeutic administration of corticosteroids. [7]They are also known as steroid- induced Cushing's syndrome or iatrogenic Cushing syndrome.1 Patients with Cushing's disease usually present with one or more signs and symptoms secondary to the presence of excess cortisol or ACTH.2 Unless the patient is taking a corticosteroid, serum cortisol levels are low in exogenous Cushing's syndrome.

The classical clinical features of Cushing's syndrome include centripetal obesity, moon facies, hirsutism, plethora, redpurple striae, bruising, proximal muscle weakness, psychiatric disturbances, osteoporosis, and menstrual irregularity. Glucocorticoid excess causes obesity by stimulating adipogenesis through transcriptional activation of adipocyte differentiation gene including lipoprotein lipase, glucocorticoid-inducible phospholipase and leptin[4]. Furthermore, excess glucocorticoid by reducing CRH (which normally has anorexic effect) causes increase in appetite and weight gain.

The common laboratory findings in Cushing syndrome includes lack of response to an ACTH stimulation test, low ACTH level, elevated fasting blood sugar level, decreased serum potassium level, lower bone density, increased blood cholesterol levels etc. Screening tests include, diurnal variations of plasma ACTH and cortisol, and serum cortisol level, normal to high both plasma and ACTH serum cortisol level, high levels of 24-h UFC, High late night salivary cortisol, desmopressin stimulation test (useful after TSA); >50% increase over the basal levels. And Conformational tests include Sella MRI, IPSS and CRH or desmopressin for tumor centralization and with prolactin assessment for confirming successful Catheterization 8-mg overnight DMST; >50% reduction in serum cortisol compared with basal levels, serum cortisol <5 µg/dL for CD.[5]

Irrational administration of glucocorticoids are most common particularly in chronic therapies which leads to many side effects like hypothalamic-pituitary-adrenal axis suppression, Cushing's syndrome, increased risk of infections and changes in mental status. Glucocorticoids are commonly used in clinical practice for the management of various autoimmune, inflammatory and allergic diseases. The pharmacokinetic properties of the glucocorticoids, individual difference in steroid metabolism, daily dosage and the duration of treatment are the factors influencing therapeutic and adverse effect of glucocorticoids.

Before initiating steroid therapy, patients should be well informed about the possible side effects of steroids. Otherwise it may lead to severe systemic side effects including Cushing's syndrome, hypertension, dyslipidemia, suppression of hypothalamic-pituitary-adrenal axis, striae, glaucoma, skin atrophy, cataract and Slowly tapering the corticosteroid that is causing Cushing syndrome can help reverse the effects of adrenal gland atrophy, predisposition to life-threatening

infections. Treatment is done by tapering the dose of corticosteroids which may take an year. Sudden stoppage corticosteroids after chronic intake can result in adrenal crisis.

### CONCLUSION:

Long time use of synthetic corticosteroids such as Budesonide is the most common cause of Cushing syndrome. Potential risk and symptoms of steroid illness associated with chronic use these medication should be thoroughly informed to patient/caretaker. The patient should undergo regular medical checkups to assess the effect of steroid in the body.

### ACKNOWLEDGEMENT:

We sincerely thank our teaching staff members and friends for providing the heartful support.

### REFERENCES:

1. Kehrl JH, Fauci AS. The clinical use of glucocorticoids. *Ann Allergy*. 1983;50:2-8.
2. A.V. Raveendran Inhalational Steroids and Iatrogenic Cushing's Syndrome 2014, (Suppl 1: M4) 74-84
3. Eldho Mathew Paul<sup>1\*</sup>, Stimson Jose<sup>1</sup>, Yogananda Achar<sup>1</sup>, Bharathi Doddu Raghunath<sup>2</sup> Prednisolone Induced Cushing Syndrome: A Case Report Apr-Jun, 2016 *Indian Journal of Pharmacy Practice*, Vol 9.
4. Rajesh Rajput Senior Professor and Head, Department Medicine VII and Endocrinology, Cushing's syndrome An update in diagnosis and management *JIACM* 2013 14(3-4): 235-41.
5. Kyu Yeon Hur<sup>1</sup>, Jung Hee Kim<sup>2</sup>, Byung Joon Kim<sup>3</sup>, Clinical Guidelines for the Diagnosis and Treatment of Cushing's Disease in Korea, 2015;30:7-18.
6. Venkateshwarlu Nandyala<sup>1</sup>, Krishna Prasad T<sup>2</sup>, P Gandiah, Iatrogenic Cushing's Syndrome in Admitted Patients to a Rural Based Medical College Hospital, January 2017, Volume 4.
7. Rachel L. Hopkins, MD, Matthew C. Leinung, MD, Exogenous Cushing's Syndrome and Glucocorticoid Withdrawal, (2005) 371-384.
8. *KJ Shetty, R Spurgeon* Chapter 65 Cushing's Syndrome: Challenges in Diagnosis and Management.