ADRENAL SUPPRESSION IN CHILDREN VS. THE NEED TO BREATHE

Inhaled corticosteroids are to treat and manage both chronic mild and moderate persistent asthma. The use of steroids in children with asthma is not without risk. This issue of CLIPS briefly summarizes an article that reviews case reports of adrenal suppression in asthmatic children treated with the inhaled corticosteroid fluticasone. If you need further information, please contact the Samford University Global Drug Information Service at (205) 726-2659.


- Inhaled corticosteroids are first-line therapy in chronic mild and moderate persistent asthma, and their efficacy has been shown with examples such as fluticasone, one of the most commonly prescribed.
- High doses of corticosteroids are linked to increased risks of adrenal suppression, as a result, the lowest possible effective dose has been recommended, especially in children.
- “Daily doses of 200 mcg achieve 90% of the efficacy of high doses.”
- Furthermore, no current recommendations for when to routinely assess inhaled-corticosteroid patients for adrenal suppression exist.

**Case Reports**
- The authors located 92 cases of adrenal suppression reported in the literature.
- Patient symptoms included: chronic fatigue, poor endurance, weakness, hypoglycemia, and confusion.
- 13 cases involved adrenal insufficiency from daily fluticasone doses < 500 mcg.
- The literature supports that patients receiving fluticasone are more likely to experience clinically symptomatic adrenal suppression than other inhaled corticosteroids such as beclomethasone, triamcinolone, or budesonide.
- Individuals may respond differently based on their own sensitivity to the drug. The main case report examined a 7-year-old boy being treated with fluticasone/salmeterol (Advair HFA™) 115 mcg/21 mcg at a dose of 2 puffs twice daily along with fluticasone nasal spray at a dose of 55 mcg/day.
  - The patient experienced recurrent respiratory infections and required 2 short courses of oral prednisolone.
  - Though the patient's mother reported her son being “uncommonly fatigued at play” and having frequent headaches, several months passed before a correct diagnosis was identified.
  - The patient was evaluated by his pediatrician, a pediatric immunologist, allergist and infectious disease specialist before being referred to an endocrinologist.
  - Fasting cortisol levels were undetectable (<1 mcg/mL) and adrenocorticotropin hormone (ACTH) levels were decreased. These values were inconsistent with patterns of primary adrenal insufficiency where cortisol levels are reduced but ACTH is high.
  - The boy was given a diagnosis of iatrogenic hypocortisolism secondary to chronic use of moderate-dose inhaled corticosteroids.
  - Treatment with hydrocortisone (10 mg/m²/day) was initiated and the boy’s symptoms improved within a few weeks.

**Adrenal Insufficiency Signs and Symptoms**
- Chronic fatigue
- Weakness
- Unexplained weight loss
- Heat intolerance
- Below expectation endurance
- Recurrent vomiting
- Hypoglycemia

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Factors that Suggest Laboratory Assessment for Adrenocortical Suppression

- Fluticasone therapy >200mcg daily for ≥3 months
- Chronic complaints of poor endurance, stamina, fatigue or weakness
- Serious injury
- Heat stress
- Multiple respiratory infections
- Diminished body surface area for age
- Nontrivial infection, pneumonia, influenza virus infection
- Chronic nausea and/or vomiting
- Difficulty fighting infections
- Growth suppression
- Symptomatic hypoglycemia

Overview

- In general, it is known that inhaled corticosteroids can improve symptoms of asthma and a patient’s quality of life.
- However, practitioners need to be aware that patients may present differently when adrenal suppression is medication-induced (secondary).
- Also, there are no current recommendations for regular or periodic monitoring of patients taking inhaled corticosteroids.
- Because the benefits of inhaled corticosteroids are not without risk, it is recommended that patients with the aforementioned signs and symptoms undergo adrenal testing.
- As a general rule, the risk of adrenal suppression is increased with
  - higher than recommended doses over prolonged periods of time
  - chronic use of higher-potency steroids, such as fluticasone or mometasone
  - combined use of inhaled steroid and intranasal steroids (e.g., Flovent™ + Flonase™)
  - swallowing of the medicine
- Of the 92 case reports of adrenal suppression, most were in children taking adult doses of inhaled corticosteroids.

Summary

- For children, recommend that inhaled corticosteroid containers that contain no more than 44 mcg/puff of fluticasone (or equipotent steroid).
- Pre-adolescent children prescribed doses exceeding 400 mcg daily should have quarterly early-morning cortisol levels checked.
- Consider step-down therapy to the lowest effective dose after asthma symptoms are controlled for a few weeks. Never abruptly discontinue therapy.