

The full report is titled: "A critical review of the effects of inhaled corticosteroids on growth" It is in the September-October 2013 issue of *Allergy Asthma Proceedings* (volume 34, pages 391 to 407). The authors are Bartholow AK, Deshaies DM, Skoner JM, and Skoner DP.

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### A CRITICAL REVIEW OF THE EFFECTS OF INHALED CORTICOSTEROIDS ON GROWTH

#### What is the Problem and What is Known About it so Far?

Inhaled corticosteroids (ICSs) are an effective therapy for the treatment of patients with persistent asthma of all severities because they reduce underlying inflammation improve lung function, reduce symptoms, and improve the overall control of asthma. Although ICSs are generally safe for long-term use, there is concern among physicians and patients about potential systemic side effects, including growth inhibition in children when given over long periods of time. Based on existing evidence, the Food and Drug Administration (FDA) requires labeling on ICSs stating that they may cause a reduction in growth velocity when administered to pediatric patients. Although there are clinical studies that show that ICSs can have these minimal effects on growth, the vast majority of these studies have limitations and have not been conducted in a standardized fashion according to current guidance to industry from the FDA. A thorough understanding of these potential adverse effects is essential for the proper use of ICSs because public concern of systemic side effects could discourage use of these effective agents for the treatment of asthma.

#### Why did the Researchers do this Particular Study?

To analyze studies performed with currently available ICSs and to determine their level of conformance with current recommended FDA guidelines.

#### Who or What was Studied?

The researchers reviewed studies performed with currently available ICSs and determined the level of conformance with the FDA guidelines.

#### How was the Study Done?

Researchers examined available ICSs studies from the standpoint of age, dose used, duration of treatment and 2 measurements of height: 1) measurement of standing height (stadiometry) and 2) measuring the distance between knee and heel of a sitting child or adolescent (knemometry)

#### What were the Limitations of the Study?

The major limitation of the study was the wide variability in design of the studies reviewed with reference to ICS preparation and dose, varying degrees of asthma and length of treatment, and lack of conformity with the current FDA guidelines.

#### What are the Implications of the Study?

The researchers found that studies of children treated with ICSs showed minimal to no significant effects on growth. When effects were seen they were associated with long term use; however ICS preparations may differ in their effects on growth. Children treated for 1 year with ICSs showed a small, dose-dependent effect of most ICSs on childhood growth. Some ICSs, at the doses studied, did not affect childhood growth. Most studies, however, did not conform completely with the current FDA guidance, clearly warranting additional studies. Although the data on effects of childhood use of ICSs on final adult height are conflicting, their effect appears to be related to the dose administered, and may result in an approximate 1.2 cm (less than ½ inch) reduction in final adult height. Balancing this potential concern, however, the availability ICSs for the treatment of asthma has provided a mainstay of asthma treatment far safer and with fewer growth inhibiting side effects than that which occurs with the long term use of systemic corticosteroids. The FDA advises physicians to monitor the growth of children taking ICSs, and to minimize systemic effects, each patient's dose should be titrated to the lowest dosage that effectively controls symptoms. As with all medications, parents should speak with their physicians concerning the appropriate use of ICSs for treatment of asthma.