Impact of long term inhaled corticosteroids on anthropometric profile and serum cortisol level among Egyptian asthmatic children

THESIS
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Abstract

We study anthropometric measurements and serum cortisol level in 63 Egyptian asthmatic children (40 boys and 23 girls), with an age range of 3 -10 years (mean age 6.65 yr), did not receive systemic corticosteroids and not suffering from systemic chronic diseases, they were selected from the Allergy Clinic at the Children's Hospital, Cairo University.

We classified them in two groups, group1 (30 asthmatic patients on ICS) and group 2 (33 asthmatic patients not received ICS). We found that there is no significant difference in anthropometric measurements and serum cortisol level between the two groups; these results support the safety of ICS on growth. More over, we found that the height of group 2 (children not on ICS) are shorter than group 1 (patients on ICS) (significant p = 0.013).

Key Words :

adrenocorticotrophic hormone - adrenocorticotrophic hormone.

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This work is humbly dedicated

To

MY FATHER MY MOTHER

My Brothers

SARAH

&

My Wife

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ABBREVIATIONS

ACTH: adrenocorticotrophic hormone.

ANOVA: analysis of variance.

B cells: B lymphocytes.

BDP: Beclonethasone dipropionate.

BHR: Bronchial hyperresponsiveness

BMI: Body mass index.

BMR: Basal metabolic rate.

BUD: Budesonide.

CAMP: Children asthma management program.

CBC: Complete blood count.

CC: Chest circumference.

CCs: corticosteroids.

Cm: centimeter.

d: day

DNA: Deoxyribonucleic acid.

e.g.: exampli gratia(for example).

ELISA: Enzyme Linked Immunosorbant Assay.

FDA: Food and drugs administration.

FEV1: forced expiratory volume in 1 second.

Fig.: figure.

FP: Fluticasone Propionate.

g: gram.

GCs: Glucocorticoids.

(GM-Csf): Granulocyte macrophage colony-stimulating factor

GR: Glucocorticoid Receptor.

HC: head circumference.

Hr: hour.

Ht: height.

i.e: id est. (that is)

ICS: Inhaled corticosteroids

IgE: Immunoglobulin E.

IGF-1: insulin growthn factor -1

IgG: immunoglobulin G.

IgM: immunoglobulin M.

IL-1: Interleukin 1

IL-5:Interleukin5

IL-6: Interleukin 6

ISAAC:International study of asthma and allergies in childhood.

IU: International unit.

K T cells: killer T cells.

Kg: kilo gram.

L: Liter.

LABA: Long-acting inhaled _2-agonists

LLL: Lower leg length.

Ltd.: Limited.

m 2:square meter.

m: millimeter.

MAC: Mid arm circumference.

µg: microgram mg: milligram.

min: minute.

ml: milliliter.

Mm2 : square millimeter.

mo :month.

N: number.

NCHS: National center for health statistics.

NS: Non significant

P: probability.

PEF: Peak expiratory flow.

PGF: Particularly peak expiratory flow.

r: correlation coefficient.

R: Receptors.

S: significant

SD: standard deviation.

SPSS: statistical package for social science.

SS: Subscabular skin –fold thickness.

Th: T helper.

TNF-α: tumor necrosis factor.

TS: triceps skin fold thickness.

UK: United Kingdom.

US: united state.

WHO: World health organization.

Wk: week.

Wt: weight.

Yr: year.

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INTRODUCTION

Bronchial asthma is a serious public health problem throughout the world, affecting people of all ages. When uncontrolled, asthma can place severe limits on daily life, and is sometimes fatal (***GINA, 2006***).

Asthma is the most common chronic disease of childhood; it is a worldwide problem that affects approximately 100 million people worldwide ***(Kemp and Hartley, 2003)***

So, it is important to assess accurately the impact of such a wide spread illness and its treatment regarding efficacy and safety.

Inhaled corticosteroids are recommended as first line anti-inflammatory therapy for the treatment of asthma. Inhaled corticosteroids have been used for the treatment of asthma in children for more than 20 yr. During this time, a substantial number of studies have been performed evaluating the safety and efficacy of this therapy. Generally, the results have been reassuring. Inhaled corticosteroids have a marked effect on both the immediate and the long-term aims of asthma therapy, (***Pedersen S ,2001***)

However concern about the potential for systemic adverse events, including linear growth and suppression of adrenal glands, has resulted in reluctance of many physicians and parents to use ICS (***Altintas DU et al., 2005***).

Many physicians are concerned about the potential side effects. There are some reports about different side effects of inhaled steroids with different dosage and duration .However most of the studies focused on particularly growth, and serum cortisol level. Results on these side effects during corticosteroid therapy are conflicting. Several studies have reported poor correlation between corticosteroid-induced short term changes in the growth rate. On the other hand completely normal growth has been reported in children receiving ICS therapy. Serum cortisol level is another important point to discuss in children treated with ICS. Some investigators have found mild to moderate suppression of adrenal function while others have normal adrenal function (***Altintas DU et al., 2005***).

In this study we aimed to investigate the effect of long term inhaled steroids on linear growth, and serum cortisol level in asthmatic children.

AIM OF THE WORK

To investigate effect of long term inhaled corticosteroid on:

1-Serum cortisol level
2-Anthropometric profile in the form of:-
a- linear growth (height, sitting height)
B- Body weight.
C-Midarm, chest, waist, and hip circumferences.
d-Triceps,subscapular skin folds.
e-Body mass index.

3-To assess safety and efficacy of inhaled corticosteroids