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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

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***Short-term Growth and Bone Turnover
in Children with Persistent Asthma During
Inhaled Steroid Therapy***

Thesis

Submitted in partial fulfillment of MD degree
(Pediatrics)

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بسم الله الرحمن الرحيم

بناء على موافقة الأستاذ الدكتور / نائب رئيس الجامعة بتاريخ ٢٠٠٣/١/٢١ اجتمعت اللجنة المشكلة من الأساتذة

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(عن المشرفين)
(ممتحن داخلي)
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بقاعة الدور الثاني بالمركز الطبى الوقائى لمناقشة علنية لرسالة الدكتوراه فى طب الأطفال المقدمة من الطيبة / كريستين وليم شاكر

وذلك فى تمام الساعة الحادية عشر صباحاً يوم الاثنين الموافق ٢٠٠٣/٤/٧ م

عنوان الرسالة:

تأثير العلاج بمركبات الكورتيزون عن طريق الإستنشاق على النمو و ديناميكية بناء و إحلال العظام فى الأطفال المصابين بالربو الشعبي المزمن على المدى القصير.

الملخص :

إن الربو الشعبي يعتبر الآن من الأمراض المزمنة المصاحبة للإلتهاب فى مجرى التنفس الذى يقل باستخدام مركبات الكورتيزون. إن الهدف من هذه الدراسة هو معرفة تأثير مستنشقات الكورتيزون على النمو و على بناء و إحلال العظام عند الأطفال المصابين بالربو الشعبي. و قد شملت هذه الدراسة ٣٤ طفلاً مصاباً بالربو الشعبي (مجموعة I) كما تشمل الدراسة ١٤ طفلاً سليماً (مجموعة II) كمجموعة ضابطة و كانت تشمل ٨ ذكور و ٦ إناث من نفس الفئة العمرية. و قد تم قياس الطول و الوزن و مؤشر كتلة الجسم (BMI) كما تم قياس نسبة مادتي PICP و ICTP قبل و بعد العلاج و التي تعكس بناء و إحلال العظام على التوالي. و قد وجد أنه لا يوجد تأثير ذو دلالة إحصائية للعلاج بمستنشقات الفلوكستيد على النمو بينما حدث إنخفاض فى مادتي PICP و ICTP و الذي يعكس إبطاء فى عملية بناء و إحلال العظام على التوالي.

و ترى اللجنة قبول البحث
رئيس اللجنة
مالح الشيش

*To my beloved Youssef
You are the light of my life*



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CONTENTS

	Page
• List of abbreviations	
• List of tables	
• List of figures	
• Key words – Abstract	
• Introduction	1
• Aim of work	2
• Review of Literature	3
➤ <u>Chapter (I): <i>Bronchial asthma:</i></u>	3
- Definition	3
- Epidemiology	4
- Prognosis	5
- Prognostic factors	6
- Mortality	7
- Morbidity	8
- Classification of asthma	9
- Genetics of asthma	13
- Environmental factors	15
- Airway pathology	16
- Pathophysiology	19
- Bronchial hyperresponsiveness	22
- Asthma triggering factors	27
- Airway inflammation	33
- Mechanisms of allergic response	37
- Inflammatory cells in asthma	41
- Inflammatory markers and mediators	64
- IgE	78
- Airway remodeling	84
- Neurogenic mechanisms in asthma	87
- Complications of bronchial asthma	89

➤ <u>Chapter (II): Initial diagnosis and treatment of asthma:</u>	91
- Medical history	92
- Physical examination	
- Pulmonary function testing	93
- Additional studies	93
- Differential diagnosis	96
- Periodic assessment and monitoring	97
- Control of factors contributing to asthma severity	101
- Preventing the onset of asthma??	103
- Immunotherapy	105
- Long-term management of asthma	106
- Managing exacerbations of asthma	112
➤ <u>Chapter (III): Glucocorticosteroids:</u>	115
- Introduction	115
- Mechanism of action	115
- Clinical efficacy of inhaled steroids in children	120
- Pharmacokinetics	121
- Dosing regimen	123
- Side effects of inhaled steroids	123
- Clinical use of inhaled steroids	134
- Systemic steroids	135
- Side effects of systemic steroids	136
- Aerosol delivery devices	136
➤ <u>Chapter (IV): Normal bone formation and turnover:</u>	139
- Bone formation	139
- Osteoblasts and bone matrix	140
- Bone mineralization	140
- Osteoclasts and bone resorption	141
- Development of bone and growth plates	142
- Bone remodeling and bone markers	145
- Statural growth	147
➤ <u>Chapter (V): Pulmonary function tests:</u>	152
- Definitions of lung volumes and capacities	152
- Measurements of lung volumes and capacities	154
- Definition of flow rates	157

- Measurements of flow rates	159
• Subjects and methods	162
• Results and analysis of data	181
• Discussion	267
• Conclusion	308
• Recommendations	309
• Summary	310
• References	312
• Arabic Summary	

KEYWORDS

Bronchial asthma – inhaled corticosteroids – pulmonary functions – growth – bone turnover

ABSTRACT

Bronchial asthma is a chronic inflammatory disease of the airways, which reflects the importance of corticosteroids as being the first line choice for anti-inflammatory therapy for long-term prophylactic treatment in persistent asthma; however, their risks must be carefully considered, especially regarding bone metabolism and growth suppression in children.

The aim of the present study was to compare the formation and degradation markers of bone turnover in children with asthma who are using inhaled fluticasone propionate (FP), as well as to study the effect of inhaled FP on short term statural growth, and the degree of improvement in pulmonary functions.

The present study included 34 asthmatic children (group I), 18 males and 16 females, of the age group 6-12 years, who were further subdivided into two groups: a) Group Ia: receiving fluticasone propionate (FP), via metered dose inhalers (MDI), at doses equal to or below 200 mcg/day (19 patients), and b) Group Ib: receiving FP at doses above 200 mcg/day (15 patients). The study also included 14 healthy, non-atopic, non-asthmatic children (group II) as controls. They were 8 males and 6 females of the same age group.

The results of the present work demonstrated a statistically significant decrease in asthma symptom score in both subgroups, as well as improvement of all asthma symptoms. A statistically significant increase in mean weight was observed in both subgroups, that was within the normal percentiles. Total patients achieved a mean increase in weight of $116.03 \pm 71.11\%$ to that predicted. Similarly, a statistically significant increase in mean height was observed in both subgroups, that was within the normal percentiles. Total patients achieved a mean increase in height of $99.35 \pm 24.48\%$ to that predicted. However, no statistically significant increase in mean BMI was demonstrated in either group. As regards pulmonary functions, a statistically significant increase in mean PEF, FEV₁, FEV₁/FVC, and FEF₂₅₋₇₅ was detected after treatment. No statistically significant difference between pre- and post-treatment mean values of serum calcium, phosphorous, and alkaline phosphatase was demonstrated. However, a statistically significant decrease in post-treatment mean values of both PICP and ICTP as compared to pretreatment values was observed implying a decrease in rate of bone turnover. Moreover, a statistically significant positive correlation was demonstrated between post-treatment levels of PICP and ICTP, and this "coupling" in decreased rate of formation as well as degradation implies no net bone loss.

List of Abbreviations

AA:	Arachidonic acid
AEC:	Absolute eosinophilic count
Alk P:	Serum total alkaline phosphatase
AP-1:	Activator protein-1
APC:	Antigen presenting cell
ASM:	Airway smooth muscle
BAL(F):	Bronchoalveolar lavage (fluid)
BDP:	Beclomethasone dipropionate
BHR:	Bronchial hyperresponsiveness
BUD:	Budesonide
C (3a, 5a, etc.):	Complement (3a, 5a, etc.)
Ca⁺⁺:	Ionized calcium
CBC:	Complete blood count
CD (4+, 8+, etc.):	Cluster differentiation antigen (4+, 8+, etc.)
CGRP:	Calcitonine gene-related peptide
COX-2:	Inducible cyclooxygenase
cPLA2:	Inducible phospholipase A2
CTAP-III:	Connective tissue activating peptide-III
CTMC:	Connective tissue mast cell
DNA:	Deoxyribonucleic acid
DPDs:	Deoxypyridinolines
DPI:	Dry powder inhaler
DSCG:	Disodium cromoglycate
EAR:	Early asthmatic response
EBV:	Epstein-Barr virus
ECM:	Extracellular matrix
ECP:	Eosinophil cationic protein
EDN:	Eosinophil derived neurotoxin
EPO:	Eosinophil Peroxidase
ERK:	Extracellular signal-regulated kinase
ERV:	Expiratory reserve volume
EPX:	Eosinophil protein X
Fab:	Fragment antigen binding
Fc:	Fragment crystalizable
FcγRII:	Intermediate affinity Fc IgG receptors
FcγRIII:	Low affinity Fc IgG receptors
FcεRI:	High affinity Fc receptors for IgE
FcεRII:	Low affinity Fc receptors for IgE
FDC:	Follicular dendritic cells
FEF₂₅₋₇₅:	Forced expiratory flow through the midportion of the FVC
FEV₁:	Forced expiratory volume in the first second
FMLP:	N-formyl-methionyl-leucyl phenylalanine
FP:	Fluticasone propionate
FRC:	Functional residual capacity
FVC:	Forced vital capacity
GH:	Growth hormone
GINA:	Global Initiative for Asthma
GM-CSF:	Granulocyte macrophage-colony stimulating factor