THE DETECTION OF BRONCHIAL HYPER-REACTIVITY IN CHILDREN WITH CHRONIC OUGH USING METHACHOLINE CHALLENGE TEST AND PULMONARY FUNCTIONS

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رسالة

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TO MY PARENTS

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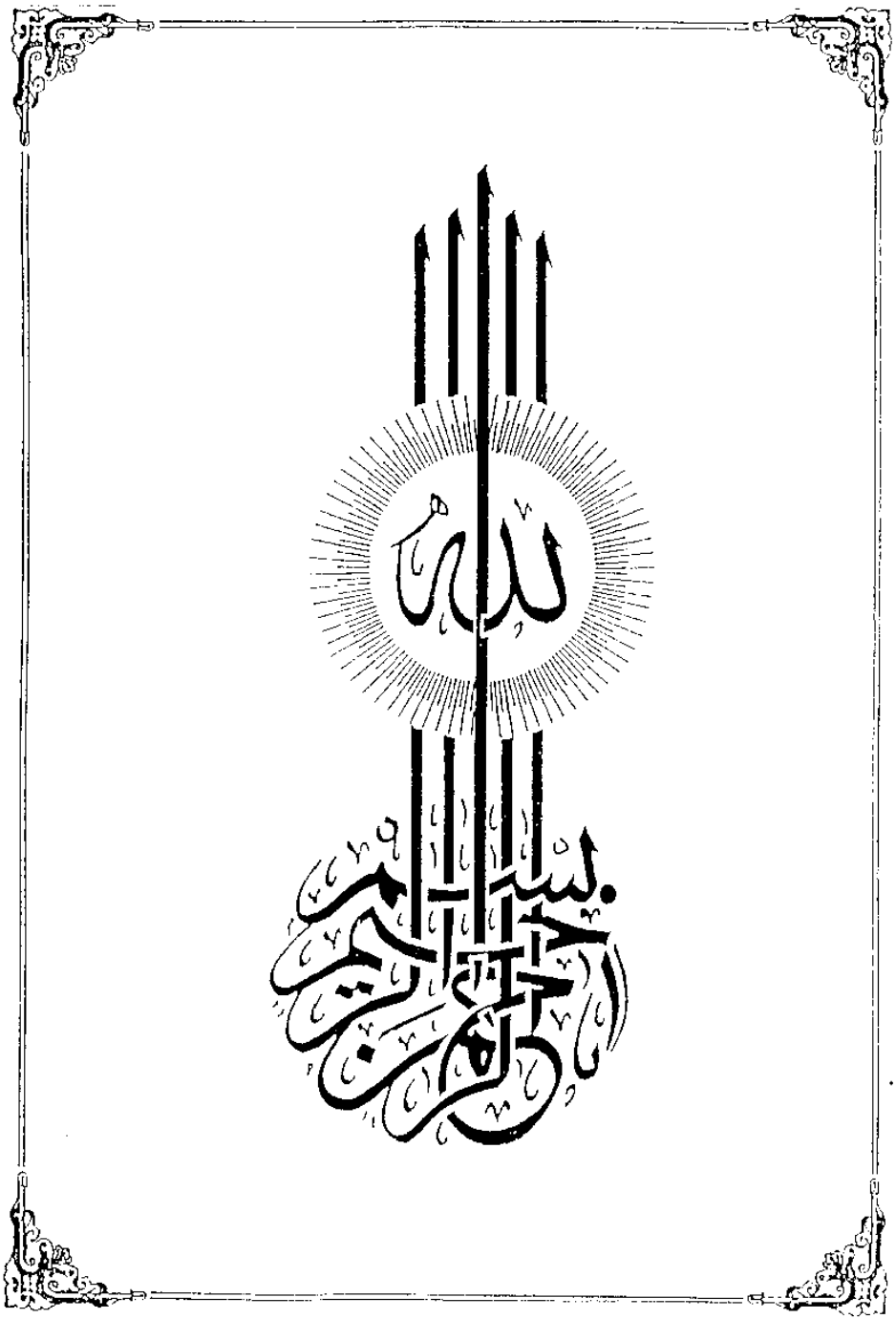

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Abbreviations

BHR Bronchial hyperreactivity

BAL Bronchial alveolar lavage

CAHC Cold - air hyperventilation challenge

CD Cumulative dose

ERV Expiratory reserve volume

FEFR Forced expiratory flow rate

$FEF_{25-75\%}$ Forced expiratory flow at 25 - 75 % of vital capacity

FEV_1 Forced expiratory volume in first second

FRC Forced residual capacity

FVC Forced vital capacity

GER Gastroesophageal reflux

IRV Inspiratory reserve volume

MBP Major basic protein

MMEF Maximum mid expiratory flow

FEF_{25-75} Mean Forced expiratory flow during the middle half of FVC

PC_{20} Mean provocative concentration causing 20% reduction in FEV_1

MCH Methacholine

MIC Methacholine inhalation challenge

PEF Peak expiratory flow

PEFR Peak expiratory flow rate

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PPV Percent predicated value

PD20 Provocative dose producing a 20% decrease in FEV1

PFT Pulmonary function test

RSV Respiratory syncytial virus

RV Residual volume

TLC Total lung capacity

TV Tidal volume

VC Vital capacity

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Introduction

Bronchial hyper-responsiveness is a condition manifested; by an exaggerated bronchoconstrictor response to many physical changes, chemical and pharmacological agents (***Boushey et al., 1980***) .

Airway hyper-reactivity can be induced or worsened by antigen inhalation, exposure to some chemical irritants and respiratory tract infections (***Dolovich et al., 1989***) .

The degree of hyper-reactivity to histamine or methacholine is directly correlated with the number of mast cells, eosinophils, desquamated epithelial cells and the major basic protein levels. Thus there is a reason to believe that airway hyper-reactivity is an index of the characteristic asthmatic airway inflammation (***Wardlaw et al., 1988***) .

Some individuals with normal spirometric tests do not show a significant bronchodilator response but still have reactive airways, this condition may occur in children with chronic cough, recurrent pneumonia, exercise intolerance, unexplained dyspnea or slow to resolve bronchitis, challenge testing may help to make a diagnosis before commiting a child to empiric therapy (***Mueller and Eigen,1992***) .

Chronic cough may be the sole manifestation of bronchial asthma (***Niimi et al., 1992***) and cough resulting from hyper-reactive airway disease is a common clinical disorder that can be treated successfully in nearly all patients (***Corrao, 1989***) .

Methacholine challenge is helpful in evaluating children with chronic cough (***Galvez et al., 1987***) . The diagnosis of hyper-reactive airway disease and its association with cough using methacholine test remains a valuable safe diagnostic tool (***Corrao, 1989***) .

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• Aim of Work :

Is to select patients with hyper-reactive airways among patients complaining of chronic cough before commiting a child to an empiric therapy .

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ANATOMY & PHYSIOLOGY
OF
RESPIRATORY SYSTEM

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CHAPTER 1

ANATOMY AND PHYSIOLOGY OF THE RESPIRATORY SYSTEM

• ANATAMY OF THE RESPIRATORY SYSTEM :

The respiratory system is divided into upper and Lower airways .The upper airway includes the nose, paranasal sinuses and the pharynx ***(Behrman and Vaughan ,1987).*** The lower airway includes the larynx , trachea and its division .The trachea divides into two main bronchi which in turn divide into lober then segmental and subsegmental bronchi, these divide into bronchioles (***Phelan et al., 1982***) . Each bronchial division is called a generation . The airway systematically branch over an average of 23 generations of dichotomous branching ending eventually in blind sac .

The airways from the mouth through the trachea (O th generation) to the terminal bronchioles (about 16th generation) constitute the conducting airways **(Fig. 1) .** They contain no alveoli, do not take part in gas exchange and constitute the anatomical dead space .

The last six to seven generations of these airways are connected to tightly packed alveoli, airway chamber in which gas exchange takes place (***Ewadd and Weibel, 1980***) .

The central airways serve the function of conducting air to the gas exchange pareynchyma. The terminal bronchioles divide into respiratory bronchioles with occasional alveoli budding from their wall and finally alveolar ducts which are completely lined by alveoli (17th- 23 rd generations) . This region is known as the respiratory zone

(***Phelan et al. , 1982***) .

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