WHEEZY CHEST IN INFANCY AND CHILDHOOI

ESSAY

This is Submitted in the Partial
Fulfilment of Master Degree

In Pediatrics

BY

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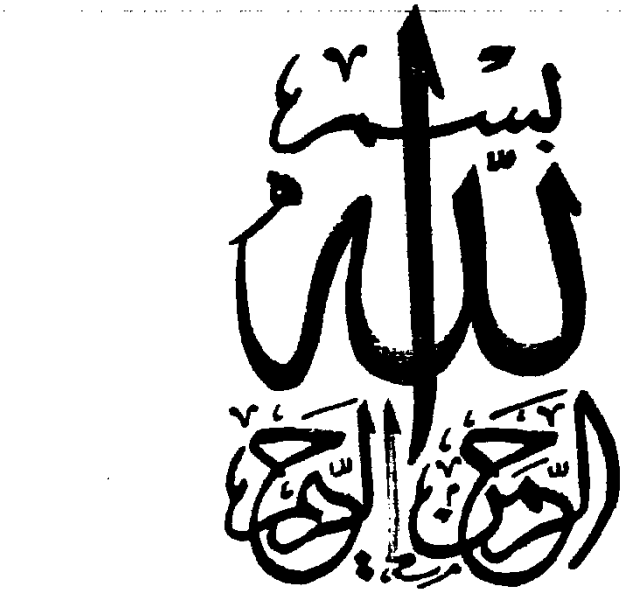

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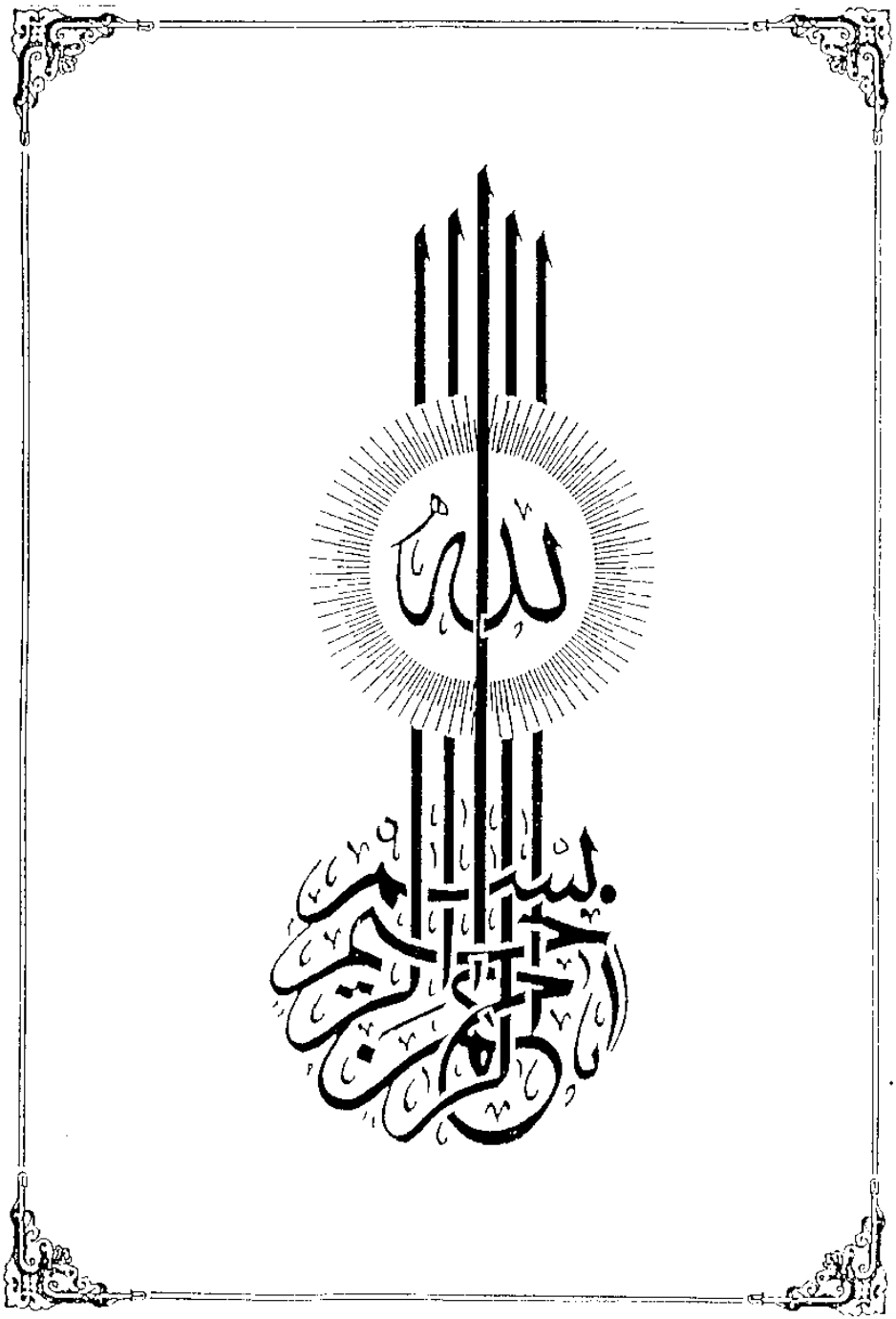

ACKNOWLEDGEMENT

Thanks first to **God.**

Then I wish to express my affectionate gratitude and indebtedness to ***Dr. Mohamed Fouad El Badrawy.*** *Prof. of Pediatrics. Ain Shams University. He provided me with the opportunity to work on this research under his guidance of which I'm most proud. He has not only, imported to me the valuable knowledge required for the undertaking of the research and bringing it to light, but also opened to me new scientific horizons as an undergraduate and as postgraduate student. He revised every word in this Essay. I am much obliged.*

INTRODUCTION

Wheezing is an abnormal sound made in the process of breathing. Despite its relatively benign character, wheezing may reflect a wide variety of diseases whose accurate diagnoses are imperative for prognosis and appropriate treatment **(Edwards, 1984).**

The major causes of wheezing in infants and children are bronchial asthma, and bronchiolitis.

In this Essay the following will be covered and discussed: etiology- pathogenesis - immune aspects-pathology - clinical picture investigtion-prevention and treatment.

AIM OF THE ESSAY

Aim of our Essay is to give a review on verious causes and theories as regards the pathogenesis of wheezy chest in addition to through light on the modern trends in the managment of such cases.

CONTENTS

WHEEZY CHEST IN INFANCY AND CHILDHOOD

WHEEZY CHEST IN INFANCY AND CHILDHOOD

Definition:

Wheezing is an abnormal sound made in the process of breathing. Wheezing, although it may be heard at a distance from the patient or by the patient himself, is usually considered to be a stethoscopic finding, ***(Edwards, 1984).***

Mechanically wheezing is the sound produced by the forcible expulsion of air through a narrow airway. It may be defined by its acoustic property as a continuous sound, longer than 250 msec, with a high pitched dominant frequency of 400 HZ or more ***(Mok, et al., 1983).***

Significance of wheezing:

Wheezing is an important symptom or finding because it reflects airway obstruction. The sound is produced by turbulent flow of gas past one or many obstructions. Despite its relatively benign character, wheezing may reflect a wide variety of diseases whose accurate diagnosises are imperative for prognosis and appropriate treatment ***(Edwards, 1984).***

Incidence:

About 11% of school children suffer from recurrent attacks of wheezing ***(Price, 1984).***

Major causes of wheezing in children:

Wheezing is a non-specific finding. Indeed, it is difficult to imagine any significant intrathoracic disease that could never produce wheezing as a clinical manifestation. Fortunately the number of diseases in which wheezing is common or predominant is finite (Table I).

TABLE "I" MAJOR CAUSES OF WHEEZING IN CHILDREN (Mok, et al., 1983)

- **Congenital and developmental causes:**
  - **Upper airway**
    - Laryngomalacia.
    - Laryngeal web
    - Chondromalacia
    - Hemangioma
    - Polyps
  - **Tracheal and bronchial anomalies**
    - Tracheomalacia: tracheobronchomalacia
    - Tracheal stenosis
    - Tracheal web
    - Tracheoesophageal fistula
    - Laryngotracheoesophageal cleft
    - Congenital lobar emphysema
    - Bronchostenosis
  - **Great vessel anomalis**
    - Vascular ring
    - Pulmonary sling
  - **Lung bud anomalies**
    - Cystic adenomatoid malformation
    - Pulmonary sequestration
    - Bronchogenic cyst
- **Familial diseases:**
  - Cystic fibrosis
  - Various immunodeficiency diseases
  - Alph1 -antitrypsin deficiency
  - Immotile cilia syndrome
  - Bronchial cartilage deficiency "Williams - Campbell Syndrome"
- **Infections**
  - Viral bronchiolitis
  - Mycoplasma infection.
  - Bacterial pneumonia
  - Fungal infection
  - Tuberculosis
  - Parasitic disease (Ascariasis)
  - Bronchiolitis obliterans
- **Mechanical obstruction:**
  - **Intrinsic lesions**
    - Airway foreign body
    - Mucous plug
    - Esophageal foreign body
    - Endobronchial tumour
    - Endobronchial granuloma
  - **Extrinsic lesion**
    - Tumours, cysts
    - Enlarged lymph nodes
    - Mediastinal mass (Leukemia, lymphoma, thymoma, teratoma, etc..)
    - Pneumothorax
    - Pleural effusion.
- **Traumatic:**
  - Chemical vapor and hydrocarbon inhalation.
  - Smoke/fire-product inhalation
  - Near-drowning
  - Episodic aspiration (e.g. following seizure, surgery, etc.)
  - Bronchopulmonary dysplasia.
- **Airway hyper-reactivity:**
  - Atopic asthma
  - Allergic reactions
  - Foods
  - Drugs "including radiographic contrast agents"
  - Insect bite with allergic reaction.
- **Secondary to other diseases**
  - Gastroesophageal reflux, achalasia.
  - Obstructing gastrointestinal lesions that promote aspiration "e.g. esophageal stricture".
  - Choanal atresia, cleft palate or disturbances of swallowing that may lead to aspiration.
  - Cardiogenic "cardiac asthma":
    - Ventricular septal defect
    - Patent ductus arteriosus
    - Cardiomyopathy,etc.
  - Pulmonary edema from any cause
  - Organophosphate poisoning.

Important causes of wheezing at different ages:

Wheezing is a symptom observed very frequently in pediatric practice and it is considered currently as a prerequisite to a number of different diagnostic categories. Even if the terminology is still somewhat controversial one could reasonably accept the existence of at least two syndromes categorizing children with wheezing:

Wheezing associated respiratory infections "WARI" and atopic asthma. Regardless of definitions, childhood syndromes present similarities and differences, which may be age-related ***(Ronchetti, et al., 1984).***

* ***In the immediate newborn period,*** *the causes of wheezing are relatively limited. Strong consideration must be given to congenital abnormalities that impinge on the major airways* ***(Haller, et al., 1978).***

* *The newborn aspiration syndromes, particularly meconium aspiration as well as neonatal pneumonias and retained fetal lung fluid can produce air-trapping and wheezes.*

* *Consideration must also be given to severe morphologic abnormalities of the heart, particularly those that produce left-sided obstruction such as the hypoplastic left heart variant and total anomalous pulmonary venous return with obstruction* ***(Strang, et al., 1969).***

* *Although congenital causes remain important during* ***the first year of life,*** *pulmonary infections predominate particularly viral*

infections and especially the respiratory syncytial virus **(Barman, et al., 1983)** *and* **(Henderson, et al., 1979).**

* *So-called "cardiac asthma", usually secondary to a cyanotic left to right shunts with pulmonary venous hypertension, commonly appears during the first year of life* **(Oh,et al., 1978).**

* *Wheezing from chronic aspiration caused by gastroesophageal reflux is most frequent in children in this age group.*

* *Children with gastroesophageal reflux usually have a history of wheezing when they are recumbent* **(Mok, et al., 1983).**

* *Although asthma is commonly believed to be a disease of older children, a substantial number of asthmatics present during the first year of life* **(Tabachnik and Levison, 1981).**

* *Recurrent pneumonias in patients of this age group may lead to the diagnosis of cystic fibrosis or much less commonly, the various immunodeficiency diseases* **(Edwards, 1984).**

* *Viral infections continue to be important causes of wheezing in children between* **the ages of one and two years,** *but the respiratory syncytial virus is relatively less prevalent than in the younger age group* **(Barman, et al., 1983) (Henderson, et al., 1979).**

* *Foreign body aspiration most often to occur in the age group between one and two years as children become independently mobile. Only about 10% of the cases occuring in those younger than one year or older than 4 years* **(Blazer, et al., 1980).**

* *Asthma, cystic fibrosis and immunodeficiency states are commonly first diagnosed at this age.*

* *Asthma and foreign body aspiration dominate the causes of wheezing in children between* ***the ages of two and five years (Frates, 1981).***

* *Viral infections, although still common have less significance than in younger age groups* ***(Godfrey, 1984).***

* *A substantial number of cases of cystic fibrosis are diagnosed at this age, indeed the clinical variability of cystic fibrosis is such that some cases are not diagnosed until adulthood* ***(Matthews and Drotor, 1984).***

* ***In school-age children,*** *chronic wheezing is most commonly caused by asthma. Of infectious etiologies, mycoplasma pneumoniae pneumonia predominates* ***(Henderson et al., 1979). As children become increasingly independent,*** *leaving home without direct supervision, various acute pulmonary insults that produce wheezing, such as near-drowning and hydrocarbon aspiration are more frequently encountered* ***(Mok, et al., 1983).***

TABLE "II" [redacted] IMPORTANT CAUSES OF WHEEZING AT DIFFERENT AGES (Edwards, 1984).

Immediate Newborn Period:

Newborn aspiration syndromes
Congenital or perinatally acquired lung infections
Congenital and developmental causes of the respiratory system
Severe cardiac malformations.

First Year of Life:

* *Viral infections (Broncheolitis).*
* *Respiratory syncytial virus.*
* *Parainfluenza virus types 1 and 3.*
* *Adenovirus.*
* *Left to right shunts (cardiac asthma).*
* *Gastroesophageal reflux.*
* *Congenital and developmental causes.*
* *Cystic fibrosis.*

One to Two Years:

- *Viral infections (R.S.V., adenovirus, parainfluenza virus types 1 and 3, influenza.*
- *Foreign body, airway or oesophagus.*
- *Asthma*
- *Cystic fibrosis*
- *Gastroesophageal reflux*
- *Non-viral lung infections*
- *congenital and developmental causes*
- *immunodeficiency diseases*
- *Cardiac asthma*

Two to Five Years:

Asthma
Foreign body, airway or oesophagus
Viral infections (adenovirus, parainfluenza virus types 1 and 3, R.S.V. and Influenza).
Non-viral lung infections.
Cystic fibrosis
Traumatic causes (hydrocarbon ingestion, etc.).

School-age Children:

Mycoplasma pneumoniae pneumonia.
Asthma
Allergic reactions
Cystic fibrosis
Traumatic causes
Viral infections
  Influenza.
  Parainfluenza.
Bronchiolitis obliterans.
Mediastinal tumours or adenopathy.

BRONCHIAL ASTHMA