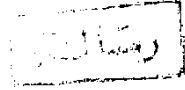


# COCKROACH SENSITIVITY IN EGYPTIAN ASTHMATIC CHILDREN



## THESIS

61292238  
E. M

Submitted in partial fulfillment of the  
**Master Degree in Pediatrics**

1994/9/18  
مكتبة

By

**ESSAM MOHAMED GALAL ABDEL-SALAM**

M.B., B.Ch.

1994/9/18  
مكتبة

*Under the supervision of*

**PROF. DR. YEHIA MOHAMED EL-GAMAL**

Professor of Pediatrics

Head of the Pediatric Allergy and Immunology Unit  
Faculty of Medicine - Ain Shams University

1994/9/18  
مكتبة

**DR. AMINA HAFEZ AWAD**

Assistant Professor of Pediatrics

Child Health Department – National Research Center

9/18/94

**DR. ELHAM MOHAMED HOSSNY**

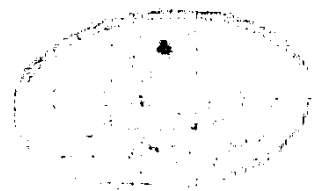
Lecturer of Pediatrics

Faculty of Medicine - Ain Shams University

**Faculty of Medicine**

**Ain Shams University**

**1994**



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

« رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ  
وَعَلَى وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي  
بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ »

صدق الله العظيم

سورة النمل ، آية ( ١٩ )



***To ...***

***My parents,***

***My wife,***

***My lovely son.***

## **ACKNOWLEDGEMENT**

*First, I thank "ALLAH " for granting me the power to accomplish this work,*

*I would like to express my endless gratitude and appreciation to **PROF. DR. YEHIA MOHAMED EL-GAMAL**, Professor of Pediatrics and Head of the Pediatric Allergy and Immunology Unit of Ain Shams University, for giving me the honour to work under his meticulous supervision and for providing me with a lot of encouragement and support throughout this whole work and always.*

*My sincere thanks and respect go to **DR. AMINA HAFEZ AWAD**, Assistant Professor of Pediatrics, Child Health Department, National Research Center, for her kind efforts and continuous supervision of this work,*

*I wish to express my deep appreciation to **DR. ELHAM MOHAMED HOSSNY**, Lecturer of Pediatrics, Ain Shams University, for her honest assistance and encouragement in*

*every step of this work. She helped me a lot to accomplish this work in the appropriate way.*

*I do appreciate the kind and active participation of **DR. SOHEIR OMAR EL-BASIONY**, Lecturer of Clinical Pathology, Child Health Department, National Research Center, in the laboratory part of this work.*

*I sincerely acknowledge the help and encouragement from every member of the Pediatric Allergy and Immunology team and I truly admire the services they provide to their patients.*

*The nice and considerate support of the Head and members of Child Health Department, National Research Center, is also acknowledged.*

*Finally, I am truly grateful to the children and their parents for their kind cooperation in accomplishing my thesis.*

***Essam Galal***

## CONTENTS

|                                    | Page |
|------------------------------------|------|
| List of Abbreviations              |      |
| List of Figures                    |      |
| List of Tables                     |      |
| Introduction and Aim of the Work   | 1    |
| Review of Literature               | 2    |
| <i>Bronchial Asthma</i>            | 2    |
| Definition                         | 2    |
| Epidemiology                       | 2    |
| Inducers and Triggerers of Asthma  | 9    |
| <i>Allergy Testing in Children</i> | 17   |
| <i>Allergens Inducing Asthma</i>   | 22   |
| Subjects and Methods               | 37   |
| Results                            | 43   |
| Discussion                         | 64   |
| Recommendations                    | 76   |
| Summary                            | 77   |
| References                         | 79   |
| Arabic Summary                     |      |

## LIST OF ABBREVIATIONS

|                  |                                        |
|------------------|----------------------------------------|
| AEC              | Absolute eosinophil count              |
| Ag               | Antigen                                |
| BLa g            | <i>Blatta germanica</i>                |
| CRa              | Cockroach antigen                      |
| CS               | Cast skin                              |
| Der f            | <i>Dermatophagoides farinac</i>        |
| Der p            | <i>Dermatophagoides pteronyssinus</i>  |
| E G              | Egg casings                            |
| ELISA            | Enzyme linked immunosorbent assay      |
| FC               | Fecal material                         |
| FEV <sub>1</sub> | Forced expiratory volume in 1st second |
| Fig.             | Figure                                 |
| FVC              | Forced volume capacity                 |
| GFE              | Germinal fecal extracts                |
| IgE              | Immunoglobulin E                       |
| MAb              | Monoclonal antibody                    |
| Per a            | <i>Periplaneta americana</i>           |
| RAST             | Radioallergosorbent test               |
| SD               | Standard deviation                     |
| VS               | Versus                                 |
| WB               | Whole body                             |

## LIST OF FIGURES

|                                                                                                                                                                                                                       | Page |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>1. Figures of Review of Literature</b>                                                                                                                                                                             |      |
| Fig (1):     The pulmonary function changes following 5-8 min of exercise are reflected in an early decrease which gradually resolves and, in some patients, a delayed or late phase response ( <i>Cropp, 1975</i> ). | 14   |
| Fig. (2): <i>Periplaneta americana</i> . Dorsal view of adult male ( <i>Huseein et al., 1978</i> ).                                                                                                                   | 30   |
| Fig (3):     Age in the studied groups.                                                                                                                                                                               | 49   |
| Fig (4):     Anti-cockroach seropositivity in the studied groups.                                                                                                                                                     | 53   |
| Fig (5):     Anti-cockroach IgE seropositivity in asthmatic children living in urban areas versus those from suburban and rural areas.                                                                                | 57   |
| Fig (6):     Anti-cockroach IgE seropositivity in asthmatic children with positive family history of atopy versus those from non-atopic families.                                                                     | 59   |
| Fig (7):     Serum anti-cockroach IgE seropositivity in asthmatic children with additional atopic manifestations versus those with asthma only.                                                                       | 61   |
| Fig (8):     Correlation of anti-cockroach IgE values to the absolute eosinophil counts.                                                                                                                              | 62   |

## LISTS OF TABLES

|                                                                                                                                   | Page  |
|-----------------------------------------------------------------------------------------------------------------------------------|-------|
| <b>1. Tables of Review of Literature</b>                                                                                          |       |
| Table (1): Exogenous and endogenous risk factors for wheezing <3 years and childhood asthma ( <i>Morgan and Martinez, 1992</i> ). | 5     |
| Table (2): Features of childhood asthma which predict continuation into adulthood ( <i>Silverman, 1992</i> ).                     | 10    |
| Table (3): Skin and in vitro tests ( <i>Ownby, 1988</i> ).                                                                        | 21    |
| Table (4): Typical airborne allergens ( <i>Reed and Swanson, 1981</i> ).                                                          | 23    |
| <b>2. Tables of Subjects and Methods</b>                                                                                          |       |
| Table (5): Classes of specific IgE seropositivity.                                                                                | 41    |
| Table (6): Interpretation of the results                                                                                          | 42    |
| <b>3. Tables of Results</b>                                                                                                       |       |
| Table (7): Clinical and laboratory data of asthmatic children.                                                                    | 44–46 |
| Table (8): Clinical and laboratory data of the control group.                                                                     | 48    |
| Table (9): Total IgE% in asthmatic patients versus healthy children.                                                              | 50    |
| Table (10): Grades of anti-cockroach seropositivity in the studied groups.                                                        | 52    |
| Table (11): Serum anti-cockroach IgE in the asthmatic children versus the control group.                                          | 55    |
| Table (12): Comparison between mildly, moderately and severely asthmatic children in the anti-cockroach IgE values (IU/ml).       | 55    |

|                                                                                                                                                        | <b>Page</b> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Table (13): Comparison of serum anti-cockroach IgE between asthmatic children from urban, suburban and those from rural areas.                         | 56          |
| Table (14): Serum anti-cockroach IgE titres in the asthmatic children with positive family history of atopy versus those with negative family history. | 58          |
| Table (15): Serum anti-cockroach IgE titres in children with other atopic manifestations beside asthma versus those with asthma only.                  | 60          |

# ***Introduction and Aim of the Work***

## INTRODUCTION AND AIM OF THE WORK

Cockroach debris is a common source of indoor allergen in atopic individuals, particularly those of lower socioeconomic status (*Gelber et al.*, 1991). Being common infestants in houses especially in developing countries may possess a problem in atopic individuals. A link to respiratory allergy has been studied by several investigators and sensitivity to cockroach body and faecal antigens was observed in inner city asthmatics (*Morris et al.*, 1986; *Pollart et al.*, 1991).

This study aimed to evaluate cockroach sensitivity in Egyptian children through measuring the anti-cockroach IgE antibodies in their serum. This may necessitate proper preventive measures in susceptible children who live under unprivileged conditions.

# ***Review of Literature***

## **BRONCHIAL ASTHMA**

### **Definition**

There is no universally accepted definition of asthma; it may be regarded as a diffuse obstructive lung disease with hyper-reactivity of the airways to a variety of stimuli and a high degree of reversibility of the obstructive process which may occur either spontaneously or as a result of treatment (*Sly, 1992*).

*Silverman* (1992) defined asthma in childhood as a persistent or episodic wheeze, usually accompanied by cough, in a clinical setting where asthma is more likely and other conditions have been excluded.

### **Epidemiology**

#### **A. Prevalence of Asthma**

*Gergen et al.* (1988) stated that the rate of asthma varies according to the definition used. Asthma may have its onset at any age, 30% of patients are symptomatic by 1 year of age, whereas, 80% to 90% of asthmatic children have their first symptom before 4 to 5 years of age (*Sly, 1992*).