

EFFECT OF POSTURAL CHANGES AND DIURNAL VARIATIONS ON LUNG FUNCTIONS IN ASTHMATIC CHILDREN

THESIS

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قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ
مَكْتُوبٌ بِاللَّهِ الْكَافِرُ
الْبَقِيَّةُ - ٢٢ -



TO...
MY MOTHER

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The Candidate

CONTENTS

Title	Page No.
INTRODUCTION AND AIM OF THE WORK	1
REVIEW OF LITERATURE	
Anatomy of the respiratory system	3
Development of the respiratory system	11
Physiology of respiration	14
Bronchial asthma	29
Pulmonary function tests	57
Normal values	77
Pulmonary function tests in asthmatic children	83
Effect of postural changes and circadian rhythm on lung function in asthmatic children	91
SUBJECTS AND METHODS	103
RESULTS	115
DISCUSSION	153
CONCLUSION AND RECOMMENDATIONS	165
SUMMARY	167
REFERENCES	169
ARABIC SUMMARY	

LIST OF TABLES

Table No.	Title	Page No.
1	Biologically active substances metabolized by the lungs	16
2	Pathologic events in asthma attributed to chemical mediators of anaphylaxis	48
3	Clinical manifestations of severe acute asthma	51
4	Grading of asthma	55
5	Comparison between obstructive and restrictive patterns of pulmonary function tests	86
6	Pulmonary function tests of group (1)	117
7	Pulmonary function tests of group (2)	119
8	Pulmonary function tests of group (3)	121
9	Diurnal variations of PEF _R and FEV ₁ in group (1)	123
10	Diurnal variations of PEF _R and FEV ₁ in group (2)	125
11	Diurnal variations of PEF _R and FEV ₁ in group (3)	127
12	The postural changes of PEF _R % at midday and at night in group (1)	129
13	The postural changes of PEF _R % at midday and at night in group (2)	131
14	The postural changes of PEF _R % at midday and at night in group (3)	133
15	T-test for PEF _R % postural difference at midday in the three groups	134

16	T-test for PEFR% postural difference at night in the three groups	135
17	T-test for PEFR% diurnal difference in the three groups	136
18	T-test for FEV ₁ % diurnal difference in the three groups	137
19	T-test for PEFR% postural difference between the three groups at midday	138
20	T-test for PEFR% postural difference between the three groups at night	139
21	T-test for PEFR% diurnal difference between the three groups	140
22	T-test for FEV ₁ % diurnal difference between the three groups	141
23	Correlation between PEFR% and FEV ₁ % at midday, at night and diurnal variation within each group	142

LIST OF FIGURES

Figure No.	Title	Page No.
1	The respiratory passages	5
2	Bronchopulmonary segments of the right lung	8
3	Bronchopulmonary segments of the left lung	8
4	Diagrammatic cross-section of a large bronchus	10
5	Mechanism of ciliary movement in the air-passages	10
6	Flow volume loop	21
7	Normal and abnormal flow volume loops	21
8	Intrapleural pressure changes during inspiration and expiration	23
9	Changes in lung volume, alveolar pressure, pleural pressure and transpulmonary pressure during normal breathing	23
10	Compliance of the lungs	27
11	Graphical representation of the three types of work accomplished during inspiration	27
12	Proposed pathways in the pathogenesis of bronchial inflammation and airway hyperresponsiveness	44
13	Cellular interactions leading to eosinophil infiltration and epithelial injury in asthma	45
14	Pathological changes in the airways in asthma	46
15	Morphologic changes in the airways in asthma	46
16	Lung volumes and capacities	60
17	Spirogram showing static V.C and dynamic FVC	60
18	Spirogram showing FVC	71

19	Spirogram showing FEV at intervals of 0.5, 1.0, 2.0 and 3.0 seconds	71
20	Peak expiratory flow (PEF)	76
21	Maximum voluntary ventilation (MVV)	76
22	Prediction normogram for children-males	80
23	Prediction normogram for children-females	81
24	Forced expiratory ratios FEV ₁ /VCx100% in children-boys and girls	82
25	Spirogram showing normal, obstructive and restrictive patterns	87
26	Spirogram showing obstructive versus restrictive patterns	87
27	Vitalograph spirometer	108
28	Principle of operation of vitalograph spirometer	110
29	Identification chart of vitalograph spirometer	110
30	Measurement of lung functions in standing position	113
31	Measurement of lung functions in supine position	113
32	A typical print-out from a vitalograph tracing	114
33	Postural changes of PEFR in group (1)	143
34	Postural changes of PEFR in group (2)	144
35	Postural changes of PEFR in group (3)	145
36	Postural changes of PEFR in the three groups at midday	146
37	Postural changes of PEFR in the three groups at night	147
38	Diurnal variation of PEFR and FEV ₁ in group (1)	148
39	Diurnal variation of PEFR and FEV ₁ in group (2)	149
40	Diurnal variation of PEFR and FEV ₁ in group (3)	150
41	Diurnal variation of PEFR in the three groups	151
42	Diurnal variation of FEV ₁ in the three groups	152

LIST OF ABBREVIATIONS

A.M.	: Ante meridiem (before midday).
A.T.S	: American Thoracic Society
BHR	: Bronchial hyperresponsiveness.
CBC	: Complete Blood Count
CCHeD	: Closed-circuit helium dilution method
CO ₂	: Carbon dioxide
EIA	: Exercise Induced Asthma
EpDRF	: A putative epithelial derived relaxant factor
ERV	: Expiratory reserve volume
FEF _{75-85%}	: Forced expiratory flow over the end portion of the curve.
FEV ₁	: Forced expiratory volume within one second.
FEV _T	: Forced expiratory volume during a given time.
FEV _{T%}	: The ratio of FEV _T to FVC expressed as a percentage.
FMEF (FEF _{25%-75%})	: Forced expiratory flow over the mid portion of the curve.
FMEFT	: Forced mid expiratory flow time.
FRC	: Functional Residual Capacity
FVC	: Forced vital capacity
GER	: Gastroesophageal Reflux
HLA	: Human Leucocytic Antigen
IC	: Inspiratory capacity
IgE	: Immunoglobulin E
IRV	: Inspiratory reserve volume
m ²	: square meter
MET	: Mid expiratory time
mm	: millimeter
MMEFR	: Maximal mid expiratory flow rate
mmHg	: millimeter mercury
ms	: millisecond
MVV	: Maximum voluntary ventilation
O ₂	: Oxygen
p	: pressure
P.M.	: Post meridiem (after midday).

PEFR : Peak expiratory flow rate
 RAST : Radioallergosorbent test
 RRP : Resting Respiratory Position
 RSV : Respiratory Syncytial Virus
 RV : Residual volume
 S.D. : Standard deviation
 SVC : Slow vital capacity
 TAV : Trapped Air Volume
 TB : Tuberculosis
 TGV (V_{TG}): Thoracic gas volume
 TLC : Total lung capacity
 TV(V_T) : Tidal volume
 VC : Vital capacity
 $V_{\max 50}$: Maximal expiratory flow at 50% of vital capacity.
 $V_{\max 75}$: Maximal expiratory flow at 75% of vital capacity.

**INTRODUCTION
AND
AIM OF THE WORK**

INTRODUCTION AND AIM OF THE WORK

Asthma is the most common chronic lung disease in children and is a leading cause of emergency room visits, hospital admissions, and school absenteeism (**Canny et al., 1991**).

Assessment of lung function in children is important, not only for the evaluation of functional changes with acute pulmonary disorders but also for longitudinal studies of the prolonged pulmonary effects of respiratory illnesses in early childhood (**Darman, 1984**).

At least 70% of asthmatic children have their attacks at night. Several mechanisms have been postulated but nocturnal asthma is still not fully understood (**Greenough et al., 1991**).

A small but detectable diurnal variation in bronchomotor tone is found in normal people (**Kerr, 1973**). This normal circadian rhythm, that occurs in absence of external stimuli, has a daylight maximum and night-time minimum and the amplitude (maximum - minimum) of this rhythm is significantly greater in asthmatics (**Lebowitz et al., 1987**).

So, nocturnal asthma probably represents an exaggeration of the normal circadian rhythm of airway calibre (**Hetzel and Clark, 1980**).

A variety of factors may contribute to nocturnal exacerbations of asthma.

On lying down, healthy subjects have a small fall in PEF while asthmatic subjects show a greater fall. So, supine posture may predispose to asthma occurring at night (**Haffejee, 1988**).

This is confirmed by **Greenough et al., in 1991**, who found a significant fall of PEF on adoption of the supine position in asthmatic children.

Aim of The Work:

The aim of this work is to determine the effect of change of posture and diurnal variation on lung function in asthmatic children.