

بسم الله الرحمن الرحيم



HOSSAM MAGHRABY



شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



HOSSAM MAGHRABY

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HOSSAM MAGHRABY



بعض الوثائق الأصلية تالفة

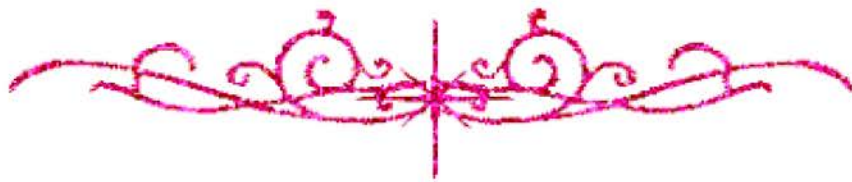


HOSSAM MAGHRABY



بالرسالة صفحات

لم ترد بالأصل



HOSSAM MAGHRABY

B10547

STUDY OF PULMONARY FUNCTIONS AND EXERCISE TOLERANCE CHANGES IN ANKYLOSING SPONDYLITIS

Thesis

*Submitted for Partial Fulfillment of The Master
Degree in Rheumatology and Rehabilitation*



By

AHMED TAHA OMAR ABOU-GHANIMA

*M.B.B.Ch.
Benha Faculty of Medicine
Zagazig University*

Supervised By

PROF. DR. MOHAMAD ZAKAREIA ERAKI

*Prof. And Head of Rheumatology and Rehabilitation Dept.
Benha Faculty of Medicine
Zagazig University*

PROF. DR. ABD EL-WAHAB MOHAMAD SHAMS

*Ass. Prof. of Rheumatology and Rehabilitation
Benha Faculty of Medicine
Zagazig University*

DR. REFAAT MOUSTAFA EL-TANAWY

*Lecturer of Rheumatology and Rehabilitation
Benha Faculty of Medicine
Zagazig University*

DR. HOSAM EL-DIN MOUSTAFA HAMZA

*Lecturer of Chest Medicine
Benha Faculty of Medicine
Zagazig University*

*Benha Faculty of Medicine
Zagazig University*

2002

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا

عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ

الْحَكِيمُ﴾

صدق الله العظيم

"البقرة ٣٢"

CONTENTS

SUBJECT	Page
□ Acknowledgement	
□ List of Abbreviation	
□ List of Tables	
□ List of Figures	
□ Introduction	1
□ Aim Of The Work	3
□ Review of Literature	
Ankylosing spondylitis	4
Pleuro-Pulmonary Manifestations of Ankylosing Spondylitis.....	24
Pulmonary Function Tests	36
Cardiopulmonary Exercise Testing	43
□ Patients and Methods.....	57
□ Statistical analysis	77
□ Results	78
□ Discussion.....	96
□ Summary and Conclusion	103
□ References	106
□ Arabic Summary	

ACKNOWLEDGMENT

"First and for most I feel indebted to Allah; the most kind and the most merciful"

I would like to express my deepest appreciation to Prof. Dr. Mohamad Zakaria Eraki; Professor and Head of Rheumatology and Rehabilitation Department, Benha Faculty of Medicine, Zagazig University, for his valuable suggestions and continuous encouragement during his supervision and revision of this work. I would like to express my deepest gratitude and sincere thanks to him.

I am greatly honoured to express my appreciation and gratitude to Prof. Dr. Abd El-Wahhab Mohamad Shams; Assistant Professor of Rheumatology and Rehabilitation, Benha Faculty of Medicine, Zagazig University, for his participation, remarkable help, brilliant ideas and follow up from the start to the end of this work.

I am particularly grateful to Dr. Refaat Moustafa EL-Tanawy; Lecturer of Rheumatology and Rehabilitation, Benha Faculty of Medicine, Zagazig University, for his close supervision, generous support, his great experience had added much to my knowledge through adding valuable suggestions and remarks.

I would like to express my special thanks for Dr. Hosam El-Din Moustafa Hamza; Lecturer of Chest Medicine Benha Faculty of Medicine, Zagazig University, for his great effort, Cooperation and his continous advices.

I would also like to thank all my professors, colleagues and staff of Rheumatology and Rehabilitation Department, Benha Faculty of Medicine, Zagazig University, for their assistance and kind care.

Ahmed Taha

LIST OF ABBREVIATION

AS	: Ankylosing spondylitis
AT	: Anaerobic threshold
BAL	: Bronchoalveolar lavage
BASFI	: Bath ankylosing spordylitis functional index
BMI	: Body mass index
BSA	: Body surface area
$C_{(a-v)}O_2$: arterio-venous oxygen content difference
\hat{CO}_2	: Carbon dioxide
CPET	: Cardiopulmonary exercise testing
CRP	: C reactive protein
CT	: Computed tomography
CTL	: Cytotoxic T lymphocytes
DICO	: Diffusion capacity for carbon monoxide
ECG	: Electrocardiography
ERV	: Expiratory reserve volume
ESR	: Erythrocyte sedimentation rate
FEF	: Forced expiratory flow
FEV ₁	: Forced expiratory volume in the first second
FRC	: Functional residual capacity
FVC	: Forced vital capacity
Hb%	: Haemoglobin concentration
HLA	: Human leukocytic antigen
HR	: Heart rate
HRCT	: High resolution computed tomography
HRR	: Heart rate reserve
IC	: Inspiratory capacity

IgA	: Immunoglobulin A
IgG	: Immunoglobulin G
IgM	: Immunoglobulin M
IRV	: Inspiratory reserve volume
L	: Liter
LAT	: Lateral
LPS	: Lipopolysaccharides
LT	: Lactate threshold
MCH	: Major Histocompatibility complex
MET	: Metabolic equivalent
mph	: Mile per hour
MVV	: Maximal voluntary ventilation
NSAID	: Non Steroidal anti-inflammatory drugs
O ₂	: Oxygen
PA	: Postero-Anterior
PEFR	: Peak expiratory flow rate
PG	: Peptidoglycan
PG- PLs	: Peptidoglycan-polysaccharids
RBCs	: Red blood cells
RPE	: Rating of perceived exertion
RV	: Residual volume
SBP	: Systolic Blood pressure
SD	: Standard deviation
SV	: Stroke volume
TAP	: Transporter associated with antigen processing gene
TCR	: T-Cell receptor
TLC	: Total lung capacity
TNF α	: Tumor necrosis factor alpha

TV : Tidal volume
VC : Vital capacity
VCO₂ : Carbon dioxide consumption
VE : Minute ventilation
VO₂ : Oxygen consumption
VO₂ max : Maximal oxygen consumption
W : Watt
WBCs : White Blood Cells
WR : Work rate

LIST OF TABLES

Table	Title	Page
Table (1)	Exercise testing equipment	47
Table (2)	Age and sex of the studied groups.....	82
Table (3)	Age of onset and duration of disease in AS group.....	83
Table (4)	Height, weight and BMI of the studied groups.....	83
Table (5)	Chest expansion and schober's test of the studied groups.....	85
Table (6)	Laboratory investigation of the studied groups.....	86
Table (7)	BASFI score of AS group	86
Table (8)	Radiological evidences of sacroiliitis in As group.....	87
Table (9)	Pulmonary function tests of the studied groups.....	88
Table(10)	CPET of the studied groups.....	90
Table(11)	Correlation coefficient between chest expansion and pulmonary function tests in AS group.....	91
Table(12)	Correlation coefficient between chest expansion and CPET in AS group.....	91
Table (13)	Correlation coefficient between Vo2 max. and pulmonary function tests in AS group.....	92
Table (14)	Correlation coefficient between Vo2 max. and variables of CPET in AS group.....	92
Table (15)	Correlation coefficient between disease duration and pulmonary function tests in AS group.....	93
Table (16)	Correlation coefficient between disease duration and CPET in AS group.....	93
Table (17)	Correlation coefficient between RPE and pulmonary function tests in AS group.....	94
Table (18)	Correlation coefficient between RPE and other variables of CPET in AS group.....	94

LIST OF FIGURES

Figure	Title	Page
Fig. (1)	Spirogram depicting the various subdivisions of total lung capacity (TLC).....	38
Fig. (2)	Methods of identifying the Anaerobic threshold (AT).	53
Fig. (3)	Pulmonary function tests in a patient with ankylosing spondylitis using Spirosift (3000) machine "Fukuda Denshi" Japan.....	71
Fig. (4)	Cardiopulmonary exercise testing in a patient with ankylosing spondylitis using Ergometer, Jaeger, Oxycon Delta, Medizintechink mit system, Miynhardt (Germany).....	73
Fig. (5)	Sex distribution in AS patients	82
Fig. (6)	Height, weight and BMI of the studied groups.....	84
Fig. (7)	Chest expansion and schober's test of the studied groups.....	85
Fig. (8)	Pulmonary function tests of the studied groups.....	89
Fig. (9)	Correlation between VO2 max. and RPE.....	95

Introduction