Study of Connective Tissue Disease Associated Pulmonary Hypertension

Thesis

Submitted For Partial Fulfillment of M.D.degree in Chest Diseases and Tuberculosis

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2018

سورة البقرة الآية: ٣٢

Acknowledgment

First of all, thanks for ALLAH *who gave me the power to complete this work.*

I would like to express my deepest gratitude and sincere appreciation to ***Prof. Mona Mansour Ahmed,*** *Professor of Chest Diseases, Faculty of Medicine, Ain Shams University for her encouragement, her kind support and appreciated suggestions that guided me to accomplish this work. Many thanks & gratitude for her.*

I am also grateful to ***Prof. Iman Hassan ELsayed Galal,*** *Professor of Chest Diseases, Faculty of Medicine, Ain Shams University, who freely gave her time, effort and experience along with continuous guidance throughout this work.*

I would like also to express my deepest thanks for ***Dr. Ayman Abdel Hamid Farghaly,*** *Consultant Pulmonary Medicine, Military Respiratory Center, for his continuous follow up and guidance throughout the work.*

I wish to introduce my deepest thanks to ***Dr.Ashraf Adel Gomaa,*** *Associate Professor of Chest Diseases, Faculty of Medicine, Ain Shams University,, for his kindness, supervision and cooperation in this work.*

Last but not least, many thanks to ***my family and my colleagues*** *for their continuous support.*

Finally, I would present all my appreciations to my patients without them, this work could not have been completed

List of Contents

List of Tables

List of Tables (Cont...)

List of Figures

List of Figures (Cont...)

List of Figures (Cont...)

List of Abbreviations

Abb.	Full term
%	Percentage
>	More than
5-HTT	5hydroxytryptamine transporter
6MWT	6-minute walking test
ADMA	Asymmetric dimethylarginine
AECAs	Antiendothelial cell autoantibodies
ANA	Anti-nuclear antibody
ANOVA	Analysis of variance
Anti-RNP	Anti-ribponucleic protein
AUC	Area under the curve
BMPR2	Bone morphogenetic protein receptor, type 2
BNP	Brain natriuretic peptide
BSA	Body surface area
cAMP	Cyclic adenosine monophosphate
CCB	Calcium channel blocker
CCL5	Chemokine Ligand 5
cGMP	Cyclic guanosine monophosphate
CHD	Congenital heart disease
CI	Cardiac index
cm	Centimeter
CMR	Cardiac magnetic resonance
CO	Cardiac output
COPD	Chronic obstructive pulmonary disease
Cpc-PH	Combined post-capillary and pre-capillary PH
CPET	Cardiopulmonary exercise testing
CREST	Calcinosis, Raynaud phenomenon, esophageal dysmotility, sclerodactyly, and telangiectasia
CT	computed tomography
CTD	Connective tissue disease:

List of Abbreviations (Cont...)

Abb.	Full term
CTDs	*Connective tissue diseases*
CTEPH	*Chronic thromboembolic pulmonary hypertension*
CTPA	*CT pulmonary angiogram*
CX3CLI	*Chemokine Ligand 1*
dcSSc	*Diffuse cutaneous systemic sclerosis*
DLco	*Diffusion lung capacity for carbon monoxide*
DPAH	*Drug-induced PAH*
DPG	*Diastolic pressure gradient*
ECG	*Electrocardiogram*
EGF	*Endothelial growth factor*
EIF2AK4	*Eukaryotic Translation initiation factor 2 alpha kinase 4*
EMG	*Electromyogram*
ESC/ERS	*European Society of Cardiology and the European Respiratory Society*
ET-1	*Endothelin-1*
ETA	*Endothelin A*
ETB	*Endothelin B*
FVC	*Forced vital capacity*
HFpEF	*Heart failure with preserved ejection fraction*
HIV	*human immunodeficiency virus.*
HPAH	*Heritable pulmonary arterial hypertension*
i.v	*Intravenous*
IIF	*Indirect immunofluorescence*
IJ	*Internal jugular*
IL-1	*Interleukin-1*
IL-6	*Interleukin-6*
ILD	*Interstial lung disease*

List of Abbreviations (Cont...)

Abb.	Full term
IPAH	*Idiopathic PH*
Ipc-PH	*Isolated post-capillary PH*
LA	*Left atrium*
lcSSc	*Limited cutaneous systemic sclerosis*
LHD	*Left heart disease*
LV	*left ventricle*
LVEDP	*Left ventricular end-diastolic pressure*
MAP	*Mitogen-activated kinase; BMPR: Bone morphogenetic protein receptor*
MCTD	*Mixed connective tissue disease*
mSAP	*Mean systemic arterial pressure*
N	*Number*
NFAT	*Nuclear factor of activated T cells*
NO	*Nitric oxide*
NPV	*Negative predictive value*
NS	*No statistically significant difference*
NT-proBNP	*N-terminal pro-brain natriuretic peptide*
PA	*Pulmonary angiography*
PAC	*Pulmonary arterial catheter*
PAH	*Pulmonary arterial hypertension*
PAPm	*Mean pulmonary arterial pressure*
PASP	*Pulmonary artery systolic pressure*
PAWP	*Pulmonary arterial wedge pressure*
PCA	*Prostacyclin analogues*
PCH	*Pulmonary capillary haemangiomatosis*
pCO2	*Partial pressure of carbon dioxide*
PDE-5-I	*Phosphodiesterase- 5-inhibitors*
PDGF	*Platelet derived growth factor*

List of Abbreviations (Cont...)

Abb.	Full term

PEA .....*Pulmonary endarterectomy*
Peak VO2.....*Peak oxygen uptake*
PFTs.....*Pulmonary function tests*
PH .....*Pulmonary hypertension*
Pimax.....*Maximal inspiratory pressure*
PPH .....*Primary PH*
PPHN .....*Persistent PH of the newborn*
PPV.....*Positive predicted value*
pSS .....*Primary Sjogren's syndrome*
PVCs .....*Premature ventricular contractions*
PVOD.....*Pulmonary veno-occlusive disease*
PVR .....*Pulmonary vascular resistance*
R.....*Correlation*
RA .....*Rheumatoid arthritis*
RANTES.....*Regulated upon activation, normal T cell expressed and secreted*
RAP.....*Right atrial pressure*
RBBB.....*Right bundle-branch block*
RHC .....*Right heart catheterization*
ROC .....*Reciever operating characteristic*
Rt .....*Right*
RV.....*Right ventricular*
RVP.....*Right ventricular pressure*
RVSP .....*Right ventricular systolic pressure*
S.....*Statistically significant*
Scl70.....*Scleroderma 70*
SD.....*Standard deviation*
SLE .....*Systemic lupus erythematosus*

List of Abbreviations (Cont...)

Abb.	Full term

SNPs ..... *Single nucleotide polymorphisms*
SPSS..... *Statistical package for social science*
SSc ..... *Systemic sclerosis*
SSc-PAH..... *Systemic sclerosis associated pulmonary arterial hypertension*
SvO2 ..... *Mixed venous oxygen saturation*
SVR..... *Systemic vascular resistance*
TAPSE ..... *Tricuspid annular plane systolic excursion*
TGF-b..... *Transforming growth factor-b*
TPG..... *Transpulmonary pressure gradient*
TR ..... *Tricuspid regurgitant jet*
TTE ..... *Transthoracic echocardiogram*
UK ..... *United Kingdom*
USA ..... *United States of America*
V/Q ..... *Ventilation/perfusion*
VE/VCO2 ..... *Ventilator equivalents for carbon dioxide*
VEGF..... *Vascular endothelial growth factor*
VF ..... *Ventricular fibrillation*
VIP ..... *Vasoactive intestinal peptide*
VO2..... *Oxygen consumption*
VO2/HR ..... *Oxygen pulse*
VPAC ..... *VIP receptors*
VT ..... *Ventricular tachycardia*
WHO ..... *World Health Organization.*
WHO-FC..... *World Health Organization functional class.*
WSPH ..... *World Symposium on PH*
WU..... *Wood units*

INTRODUCTION

Pulmonary hypertension (PH) is a substantial global health issue in which all age groups are affected with rapidly growing importance in elderly people.[1]

PH embraces a variety of diseases that have little in common apart from elevated blood pressure in the pulmonary circulation.[2]

Precise diagnostic classification of pulmonary hypertension is essential, not least for reasons of treatment and prognosis, because treatment options that are efficacious in some forms of pulmonary hypertension may be ineffective or even disadvantageous in other forms.[2]

Pulmonary arterial hypertension (PAH) affects 0.5–15% of patients with connective tissue diseases (CTDs) and is one of the leading causes of mortality in systemic sclerosis (SSc) and mixed connective tissue disease (MCTD). Despite increasing recognition of PAH in CTDs, the diagnosis is often delayed, which may lead to unfavorable outcomes in these patients. [3]

Screening for PAH in SSc allows for earlier detection and treatment that prolongs survival and improves symptoms but it is important that clinicians who follow SSc patients screen and act upon the results, such as referring suspected PAH for right heart catheterization (RHC) and treatment at an expert center.[4]