

EARLY CHANGES OF CARDIAC STRUCTURES AND FUNCTIONS IN COPD PATIENTS

Thesis

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LIST OF ABBREVIATIONS

API	α 1 protease inhibitor
ATP	Adenosine tri phosphate
ATS	American thoracic society
BAL	Broncho alveolar lavage
BCM	body cell mass
BMI	body mass index
BTS	British thoracic society
CLE	centrilobular emphysema
COPD	Chronic obstructive pulmonary disease
Creat	Creatinine
CSE	Cigarette smoke extract
ECG	Electro cardiogram
ECP	eosinophil cationic protein
EGF	epidermal growth factor
EPO	eosinophil peroxidase
ERP	elastic recoil pressure
ERS	European respiratory society
ESCT	Egyptian society of chest diseases and tuberculosis
ET-1	Endothelin-I
FEV1	Forced expiratory volume in first second
FFM	fat-free mass
FRC	functional residual capacity

LIST OF ABBREVIATIONS (Cont...)

FRC	Functional residual capacity
FVC	Forced vital capacity
FVC	Forced vital capacity
GH	growth hormone
GM-CSF	Granulocyte-macrophage colony stimulating factor
GOLD	Global initiative of lung disease
H ₂ O ₂	Hydrogen peroxide
HGB	Haemoglobin
HR	Heart rate (beat per minute)
IGFs	Insulin-like growth factors
IL-8	Interleukin-8
LTB ₄	leukotriene B ₄
LV	left ventricular
LVEDV	Left ventricular end diastolic volume
LVESV	Left ventricular end systolic volume
LVWT	Left ventricular wall thickness
MCP-1	Macrophage chemotactic protein-1
MIP-1 α	macrophage inflammatory protein-1 α
MMPs	matrix metallo proteinases
MPO	myeloperoxidas
NE	neutrophil elastase
NK	natural killer
NO	Nitric oxide
NO ₂	Nitric dioxide

LIST OF ABBREVIATIONS (Cont...)

PaCO ₂	Partial carbon dioxide tension
PaO ₂	Partial oxygen tension
PLE	panlobular emphysema
PLT	Platelets
PvAccT	Per ventricular Acceleration Time (msec)
RBCs	Red blood cells
RV	Residual volume
RV	right ventricular
RVEDV	Right ventricular end diastolic volume
RVESV	Right ventricular end systolic volume
RVWT	Right ventricular wall thickness
SICAM-I	soluble intercellular adhesion molecule
SLPI	secretory leukoproteinase inhibitor
TCA	tricarboxylic acid
TGF-B	Transforming growth factor-B
TLC	total lung capacity
TNF- α	Tumor necrosis factor alpha
Urea	Urea
V / Q	ventilation perfusion ratio
VC	Vital capacity
VIP	vasoactive intestinal peptide
WBCs	White blood cells
WHO	World health organization
α 1-AT	Alpha-1 antitrypsin
α 1-Pi	Alpha-1 protease inhibitor

INTRODUCTION

There is no universally accepted terminology or definition for the group of conditions characterized by airway obstruction that is incompletely reversible (*Snider et al., 1996*).

There are several problems that have to be considered. The first results from the use of the term "chronic obstructive pulmonary disease" (COPD) which is considered inaccurate since this is not truly a disease but a group of diseases (*Siafakas et al., 1995*).

The guideline published by the American Thoracic Society (ATS) define COPD as "a disease state characterized by the presence of airflow obstruction due to chronic bronchitis or emphysema, the airflow obstruction is generally progressive, may be accompanied by airway reactivity, and may be partially reversible (*American Thoracic Society, 1995*).

The European respiratory society (ERS) has adopted a similar definition "a disorder characterized by reduced maximum expiratory flow and slow forced emptying of the lung, features which do not change markedly over several months" (*British Thoracic Society, 1997*).

However, the term "chronic bronchitis and emphysema" has often been used loosely to define a patient with chronic cough and associated airflow obstruction, although airflow obstruction does not appear in the definition, the most widely term is COPD, which has been accepted in the British Thoracic Society (BTS) guidelines on the management of this condition and is the title of a major British textbook on the subject (*Calverley et al., 1996*).

Hypersecretion of mucus is a symptom that has been extensively studied in general population surveys over the last 40 years. In these studies, usually in the middle – aged men, the prevalence of chronic cough, or chronic cough and the production of sputum, ranges between 15 and 53%, with a lower prevalence of 8-22% in women, being more prevalent urban than rural areas (*Anderson et al., 1994; Cullinan et al., 1992*).

The classical view of the development of heart failure in patients with COPD is that hypoxia leads to pulmonary hyperstension, which imposes increased work in the right ventricle, leading to right ventricular hypertrophy and eventually right ventricular dilatation and the development of peripheral oedema (*Rubin et al., 1998*).

Previous research was done by Vonk-Noordegraaf and his colleagues, the researchers found that the right ventricles of the patients with COPD were abnormally enlarged compared to those without the disease. The ventricular structure had been altered in the COPD group, as well. However, the function of both ventricles in the COPD patients and in those who were healthy was generally about the same. However the early changes in the cardiac structure and function in COPD patients are doubtful (*Via Braschi et al., 2004*).

Doppler echocardiography is proving to be useful way of assessing pulmonary artery pressure. The measurement that have been utilized include the pre-ejection period, which is the time interval from the onset of electrocardiographic QRS to the onset of pulmonary artery systolic flow, the acceleration time, which is the time between the onset of flow to the peak systolic flow, and ejection time which is the interval from the onset to the cessation of flow, the one measurement that most investigators agree is important is the acceleration time (*Senecal et al., 1977*).

AIM OF THE WORK

The aim of the work is to assess the early changes in the cardiac structure and function in COPD patients.

Chronic Obstructive Pulmonary Disease

The term "chronic obstructive pulmonary disease" (COPD) describes a heterogeneous and overlapping group of disorders. Indeed, standards of the American thoracic society define "COPD" as a "disorder characterized by abnormal tests of expiratory flow (structural or functional) that do not change markedly over periods of several months observation". As such, this definition subsumes chronic bronchitis (a clinical diagnosis), emphysema (a pathological diagnosis), and peripheral airway disease, but excludes specific causes of airflow obstruction such as bronchiectasis or cystic fibrosis (*A.T.S., 1995*).

Definition

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases, primarily caused cigarette smoking. Although COPD affects the lungs it also produced significant systemic consequences (*Celli et al., 2004*).
