Effect Of Statins On Pulmonary Functions in COPD Patients

Thesis

Submitted for Partial Fulfillment of Master Degree
in Chest Diseases and Tuberculosis

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List of Abbreviation

ASTEROID trail	A clinical trial published in 2006 that shows the effects of statins on atherosclerosis
BEC	Bronchial Epithelial Cells
BODE	body mass index, airflow obstruction, dyspnea, and exercise capacity
BTS	British Thoracic Society
CAL	Chronic Airflow Limitation
CD4,CD8	Claster of Differentiation (is a glycoprotein expressed on the surface of T helper cells, regulatory T cells, monocytes and macrophages).
CHD	Coronary Heart Disease
COPD	Chronic Obstructive Pulmonary Disease
CRP	C-reactive protein
CT	Computed tomography
CXP3A4	3A4 isoform of cytochrome P450
Cyclic AMP	Cyclic Adenosine monophosphatase
DALY	The Disability-Adjusted Life Year
ESCT	The Egyptian Society of Chest Diseases and Tuberculosis
ETS	Environmental Tobacco Smoke
FDA	Food and Drug Administration
FEF_{25-75}	Forced expiratory flow 25% to 75%.
FEV_1	Forced expiratory volume in first second.
FVC	Forced vital capacity

GM-CSF	Granulocyte-macrophage Colony Stimulating Factor
GTPase	Enzyme bind and hydrolyze guanosine triphosphate
GOLD	Global Initiative for Chronic Obstructive Lung Disease
H. influenza	Hemophilus influenza
HMG-CoA reductase	3-hydroxy-3-methylglutaryl coenzyme A reductase
HPS	Heart Protection Study
ICU	Intensive Care Unit
IL-1,6,8	Interleukin-1,6,8
KCO	transfer coefficient
KPa	Kilopascal (a unit of pressure measerment)
LDL	low density lipoprotein
LTB4	leukotriene B4
LVRS	Lung Volume Reduction Surgery
M_2 receptor	Muscarinic receptor
MENA	Middle East and North Africa region
M. catarrhalis	Moraxella catarrhalis
mEPHX1	microsomal epoxide hydrolase 1
NHANES III	The third National Health And Nutrition Examination Survey
NIPPV	Noninvasive intermittent positive pressure ventilation
PaO_2	Partial pressure of oxygen
$PaCO_2$	Partial pressure of carbon dioxide

PH	Pulmonary Hypertention
Pemax	Maximum expiratory pressure
PFT	Pulmonary Function Tests
Pimax	Maximum inspiratory pressure
S.pneumoniae	streptococcus pneumoniae
SaO_2	Oxygen saturation
SREBPs	Sterol Regulatory Element Binding Proteins
TLCO	Carbon monoxide Transfer Factor
TGF-1	Transforming Growth Factor beta 1
TNF-α	Tumor Necrosis Factor alpha
μg	Microgram
V_A/Q	Ventilation/ Perfusion ratio
WHO	World Health Organization
YLD	Years of Living with Disability

Introduction

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 progressive and is associated with an abnormal inflammatory response of the lungs to noxious particles or gases. Worldwide cigarette smoking is the overwhelming risk factor for COPD, although in many countries, air pollution resulting from the burning of wood and other biomass fuels has also been identified as a COPD risk factor *(GOLD, 2009).*

Although COPD affects the lungs, it also produces significant extrapulmonary effects that may contribute to disease severity in individual patients *(Agusti, 2005).*

A diagnosis of COPD should be considered in any patient who has symptoms of cough, sputum production, or dyspnea, and/or a history of exposure to risk factors for the disease *(GOLD, 2009).*

Statins"3-hydroxy-3-methyl-glutaryl-coenzyme-A (HMG- CoA) reductase inhibitors", are a class of drugs that lower cholesterol level in people with or at risk of

cardiovascular diseases. They lower cholesterol by inhibiting the enzyme HMG-CoA reductase which is the rate-limiting enzyme of mevalonate pathway of cholesterol synthesis *(Endo, 1992)*.

Statins are used for their lipid lowering characteristics but also appear to have anti-inflammatory and immunomodulatory properties which could possibly influence inflammatory airway disease *(Keddissi et al., 2007).*

Previous studies assessed evidence for disease modifying effects of statin treatment in patients with COPD. Outcomes associated with treatment with statins included decreased COPD related mortality, reduction in incidence of respiratory related urgent care, fewer COPD exacerbations, fewer intubations for COPD exacerbations and attenuated decline in pulmonary function *(Dobler et al., 2009).*

Aim of the Work

The aim of this work is to assess the effect of statins on pulmonary functions in COPD patients.