STUDY OF SERUM VITAMIN D LEVEL IN STABLE CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS

Thesis

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

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بسم الله الرحمن الرحيم
قَالَ رَبِّ اشْرَحْ لِي صَدْرِي, وَيَسِّرْ لِي أَمْرِي, وَاحْلُلْ عُقْدَةً مِّن لِّسَانِي، يَفْقَهُوا قَوْلِي
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List of Abbreviations

1, 25 (OH)$_2$	*1, 25-hydroxyvitamin D levels.*
25(OH) D	*25-hydroxyvitamin D levels.*
AAP	*The American Academy of Pediatrics.*
ABG	*Arterial blood gases.*
ATS	*The American Thoracic Society.*
BLVR	*Bronchoscopic lung volume reduction.*
BMI	*Body mass index*
BTS	*The British Thoracic Society.*
CBC	*Complete blood count.*
CD4	*cluster of differentiation 4.*
CD8	*Cluster of differentiation 8.*
Chest x-ray P-A view	*Chest x-ray post-anterior view.*
COPD	*Chronic obstructive pulmonary disease.*
CT	*Computed tomography.*
DLCO	*Diffusing Capacity of the Lung for Carbon Monoxide.*
ECG	*Electrocardiogram.*
ELISA	*Enzyme-linked immunosorbent assay.*
ERS	*The European Respiratory Society.*
ESR	*Erythrocyte sedimentation rate.*
ETS	*Environmental Tobacco Smoke.*
FEV$_1$	*Forced expiratory volume in first second.*
FEV$_1$/FVC	*Forced expiratory volume in first second/ forced vital capacity.*

FVC	*Forced vital capacity.*
GM-CSF	*Granulocyte-Macrophage Colony Stimulating Factor.*
GOLD	*Global Initiative for Chronic Obstructive Lung Disease.*
HAL-DRB1	*Human leucocytes antigen DRB1.*
HIV	*Human immunodeficiency virus.*
ICU	*Intensive care unit .*
IFN-γ	*Interferon gamma.*
IL-8	*Interleukin 8.*
IOM	*Institute of Medicine.*
LTB4	*Leukotriene B4.*
LVRS	*Lung volume reduction surgery.*
MCP-1	*Monocytes chemo tactic protein-1.*
MENA	*Middle East and North Africa region.*
MIP-1	*Macrophage inflammatory protein-1.*
MMP-9	*Matrix metalloproteinasis-9.*
NHANES	*The National Health and Nutrition Examination Survey.*
$PaCO_2$	*Arterial partial pressure ofCO_2 .*
PAD	*Peripheral artery disease*
PaO_2	*Arterial partial pressure of O_2 .*
RTI	*Respiratory tract infections.*
SaO_2	*Oxygen saturation.*
SD	*Standard deviation.*

SNP	*Single nucleotide polymorphism.*
TLR	*Toll-like receptors.*
TNF alpha	*Tumor necrosis factor alpha.*
TRPV6	*Transient receptor potential cation channel, subfamily V, member 6.*
URTI	*Upper respiratory tract infections.*
US	*United States of America .*
UV	*Ultraviolet*
VDBP	*Vitamin D-binding protein.*
VDR	*vitamin D receptor.*
VDRE	*Vitamin D Responsive Element.*
Yrs	*Years.*

INTRODUCTION

Chronic obstructive pulmonary disease is a major cause of chronic morbidity and mortality throughout the world. Many people suffer from this disease for many years and die prematurely from it or its complications. COPD is the fourth leading cause of death in the world and further increase in its prevalence and mortality can be predicted in the coming decades *(GOLD, 2009).*

COPD is a preventable and treatable disease with some significant extra pulmonary effects that may contribute to the severity of the disease in individual patients. Its pulmonary component is characterized by air flow limitation that is not fully reversible. The air flow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to an anoxoius particles or gases *(GOLD, 2009).*

Vitamin D is a fat soluble vitamin that is naturally present in very few foods, added to others and available as dietary supplement, it is also produced endogenously when ultraviolet rays from sunlight strike the skin and trigger vitamin D synthesis *(DeLuca, 2004).*

Vitamin D obtained from sun exposure, food and supplements is biologically inert and must undergo two hydroxylation in the body for activation. The first occurs in the liver and convert vitamin D to 25-hydroxy vitamin D [25(OH)] also known as calcidiol. The second occur primarily and forms the physiologically active1, 25 dihydroxy vitamin D[1,25(OH)D] also known as calcitriol *(Van, 1997).*

Serum concentration of 25(OH) is the best indicator of vitamin D status. It reflects vitamin produced cutaneously and that obtained from food and supplements *(Institute of Medicine, Food and Nutrition Board, 1997)* and has a fairly long circulating half life 15 days *(Jones, 2008).*

Deficiency of vitamin D is common and represents a major health problem. Accumulating evidence has also links a low vitamin D nutritional status to highly prevalent chronic illness including common cancers, autoimmune diseases, infectious and cardiovascular diseases *(Bouillon et al., 2008)*similar to other chronic disease, it was recently found that vitamin D might also be linked to COPD *(Janssens et al., 2009).*

Patients with COPD were considered at high risk for variety of reasons, a lower food intake, reduced capacity of aging skin from vitamin D synthesis, the

absence of outdoor activity and sun exposure, an increased catabolism by glucocorticoids, impaired activation because of renal dysfunction and a lower storage capacity in muscles or fat due to wasting may contribute to a defective vitamin D status in patients with (COPD) *(Holick, 2007).*