Use of Spirometry as an Objective Tool in Diagnosis and Management of Airway Obstruction among Patients Diagnosed and Treated as COPD or Asthma

Thesis

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List of Abbreviations

Abb.	Full term
AATD	*Alpha-1 antitrypsin defeciency*
ABG	*Arterial blood gases*
ACCP	*American college of chest physicians*
ACP	*American college of physicians*
ACT	*Asthma control test*
AECOPD	*Acute exacerbation of Chronic obstructive pulmonary disease*
AERD	*Aspirin Exacerbated Respiratory Disease*
AEs	*Asthma exacerbations*
ATS	*American respiratory society*
BHR	*Bronchial hyperesponsivness*
BS	*Bronchial thermoplasty*
CAT	*COPD Assessment Test*
CCQ	*COPD Control Questionnaire*
CD4	*Cluster Of Differentiation 4*
CD8	*Cluster Of Differentiation 8*
COPD	*Chronic obstructive pulmonary disease*
CXR	*Chest X-ray*
DALYs	*Disability-Adjusted Life Years*
DLco	*Diffusing capacity of lung for carbon monoxide*
ED	*Emergency department*
EIA	*Exercise induced asthma*
ERS	*European respiratory society*
Fev1	*Forced expiratory volume in 1 second*
FLG	*Filaggrin gene*
FRC	*Functional Residual Capacity*
FVC	*Forced vital capacity*
GERD	*Gastroesophageal reflux*
GINA	*Global Initiative for Athma*
GOLD	*Global Initiative for Chronic Obstructive Lung Disease*
ICS	*Inhaled corticosteroid*

List of Abbreviations cont...

Abb.	Full term
IFN	*Interferon*
IgE	*Immunoglobulin E*
IL	*Interlukin*
ISAAC	*International study of asthma and allergies in childhood*
LABA	*Long acting Beta 2 agonist*
LAMA	*Long acting muscarinic antagonist*
LTRA	*Leukotriens receptor antagonist*
MMP12	*Matrix metalloproteinase 12*
mMRC	*Modified British Medical Research Council*
NIV	*Non invasive ventilation*
Nrf2	*Nuclear factor erythroid 2-related factor 2*
OCS	*Oral corticosteroids*
OSHA	*Occupational safety and health administration*
PEF	*Peak expiratory flow*
PFT	*Pulmonary function test*
RV	*Rhinovirus*
SABA	*Short acting Beta2 agonist*
SAMA	*Short acting muscarinic antagonist*
SARP	*Severe Asthma Research Program*
SPT	*Skin prick test*
TLC	*Total Lung Capacity*
TNF	*Tumor necrosis factor*

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles and gases ***(GOLD, 2017).***

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It's defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation ***(GINA, 2017).***

Spirometry is essential for the assessment of patients with suspected chronic disease of the airways. It must be performed at either the initial or subsequent visit if possible before and after a trial of treatment. Early confirmation or exclusion of the diagnosis of chronic airflow limitation may avoid needless trial of therapy, or delays in initiating other investigations ***(GINA, 2017).***

The diagnosis of COPD should be considered in any patient who has the following: symptoms of cough, sputum production, or dyspnea, or history of exposure to risk factors of the disease (exposure to cigarettes, and/or occupational or

environmental pollutants).The diagnosis requires spirometry; a post-bronchodilator forced expiratory volume in one second (FEV1)/ forced vital capacity (FVC) ≤0.7 confirms the presence of airflow limitation that is not reversible ***(Celi et al., 2004).***

Screening spirometry influences physicians' diagnosis of airflow obstruction and management plans especially in patients with moderate to severe obstruction ***(Robert, 2005).*** Misdiagnosis of COPD or Asthma leads to inadequate management of patients and to escalating healthcare costs. An early and accurate diagnosis can help to ensure optimal and cost-effective management of patient care ***(Kuebler et al., 2008).***

Objective confirmation of airway obstruction is essential in preventing misdiagnosis in frequent severe exacerbators of clinically diagnosed asthma and COPD. Spirometry utilization is strongly associated with a reduced risk of misdiagnosis ***(Jain et al., 2015).***

Aim of the Work

To assess use of spirometry as an objective tool in diagnosis and management of patients treated of obstructive lung diseases (Asthma and COPD).

Chapter 1:

COPD Review

Definitions:

Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease that is characterised by persistent symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases ***(GOLD, 2018).***

Chronic obstructive pulmonary disease (COPD) refers to a group of diseases that cause airflow blockage and breathing-related problems. It include chronic bronchitis, emphysema, and in some cases asthma ***(Centers for Disease Control and Prevention, 2015).***

COPD is characterized by airflow obstruction that is not fully reversible. The airflow obstruction does not change markedly over several months and is usually progressive in the long term. COPD is predominantly caused by smoking. Other factors, particularly occupational exposures, may also contribute to the development of COPD. Exacerbations often occur, where there is a rapid and sustained worsening of symptoms beyond normal day-to-day variations ***(Nice, 2010).***

Asthma and chronic obstructive pulmonary disease (COPD) are traditionally recognized as distinct diseases. However, the difference between the two is not always clear. Patients with severe asthma may present with fixed airway obstruction, and patients with COPD may have hyper-responsiveness and eosinophilia. Recognizing and understanding these overlapping features, may offer new insight into the mechanisms and treatment of chronic airway inflammatory diseases ***(Kim and Rhee, 2010).***

Burden of (COPD)

Epidemiology: COPD is a leading cause of morbidity and mortality worldwide and results in an economic and social burden that is both substantial and increasing. COPD prevalence, morbidity, and mortality vary across countries and across different groups within countries. COPD is the result of cumulative exposures over decades. Often, the prevalence of COPD is directly related to the prevalence of tobacco smoking, although in many countries, outdoor, occupational and indoor air pollution, are major COPD risk factors. The prevalence and burden of COPD are projected to increase in the next decades due to frequent exposure to risk factors and the aging of the world's population ***(GOLD, 2018).***

Prevalence:

Approximately 65 million people have moderate-to-severe COPD ***(WHO, 2015).***