CHRONIC OBSTRUCTIVE LUNG DISEASE: A RISING PROBLEM FOR THE WORLD

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Chronic obstructive pulmonary disease (COPD) is a chronic respiratory disease that is characterized by air flow obstruction and not fully reversible.

COPD is divided into two entities; emphysema and chronic bronchitis. The word "emphysema" is derived from the Greek word “emphysan” meaning "inflate”.[3] The term chronic bronchitis came into use in 1808.[4] The term COPD is believed to have first been used in 1965.[5] Previously it has been known by a number of different names, including chronic obstructive bronchopulmonary disease, chronic obstructive respiratory disease, chronic airflow obstruction, chronic airflow limitation, chronic obstructive lung disease, nonspecific chronic pulmonary disease, and diffuse obstructive pulmonary syndrome.

The terms chronic bronchitis and emphysema were formally defined in 1959 at the CIBA guest symposium and in 1962 at the American Thoracic Society Committee meeting on Diagnostic Standards.[5]

Globally, as of 2010, COPD affected approximately 329 million people (4.8% of the population).[6] There has been increased tobacco use among women in the developed world.[7] Some developed countries have seen increased rates, some have remained stable and some have seen a decrease in COPD prevalence.[8] The global numbers are expected to continue increasing as risk factors remain common and the population continues to get older.[9] In 2012 COPD became the third leading cause of deaths.[10] In some countries, mortality has decreased in men but increased in women.[11] This is most likely due to rates of smoking in women and men becoming more similar.[12] COPD is more common in older people.[13]

In England, an estimated 0.84 million people (of 50 million) have a diagnosis of COPD.[14] In the United States approximately 6.3% of the adult population, totalling approximately 15 million people, have been diagnosed with COPD.[15] In 2011, there were approximately 730,000 hospitalizations in the United States for COPD.

In Pakistan, COPD mortality rate is estimated to be 71 deaths per 100,000, which is the fourth highest rate among the 25 most populous nations in the world.[16] Global prevalence of COPD ranges from 4 to 10 % in general population over age 40 years.[17]

Risk Factors: following are the recognized risk factors for the development of COPD.

Environmental Factors: smoking the most common risk factor for COPD.[18] This may be in the form of cigars, cigarettes, marijuana, pipe and water pipe. Passive smoking can also cause COPD in long term.[19]

Other risk factors include occupational exposure to a number of substances like organic and inorganic dusts, fumes and chemical agents,[20] indoor pollution, air pollution, chemicals etc.

Genetic Factors: All those who smoke do not develop COPD. This can be explained genetic susceptibility to the development of COPD. Alpha-1 antitrypsin is one of them accepted to be responsible for COPD that is encoded by the SERPINA1 gene.[21] Another gene that encodes metalloproteinase is associated with accelerated lung function decline.

Immune Factors: lung tissue damage caused by exposure to noxious stimuli like smoke, dust and chemicals leads to release of inflammatory markers that can be responsible for lung damage. There is also decreased numbers of regulatory T cells in smoker's

lung than non-smokers.[22]

Others: Poverty and asthma may be risk factor for COPD development but evidence is still lacking.

Burden of COPD; COPD is a leading cause of mortality and morbidity in the world. It causes substantial and increasing economic and social burden2.[23,24] Morbidity and mortality varies across countries and within countries in special groups. Due to continue exposure to risk factors and ageing of the populations, COPD burden increases over the coming decades. More people will express the effects of COPD risk factors as the longevity increases.[25]

Prevalence: the existing prevalence data vary widely because of differences in survey methods, diagnostic criteria and analytical approaches. Self-reporting of a doctor's diagnosis of COPD estimates the lowest prevalence. Despite of complexities, more accurate estimates of COPD prevalence data is emerging. Survey data between 1993 to 2004 in 28 different countries suggests that COPD is more common in smokers, ex-smokers compared to non-smokers, more in people age more than 40 years and in men than women.[26] PLATINO, the Latin American project for the investigation of obstructive lung disease examined the prevalence of air flow limitation in persons more than 40 years of age in one city from each 5 Latin American countries- Brazil, Chile, Venezuela, Mexico and Uruguay. Prevalence ranges from 7.8% in Mexico city, Mexico, to 19.7% in Montevideo, Uruguay.[27] The prevalence was high in men, smokers and persons aged more than 60 years.

Burden of obstructive lung disease (BOLD) has completed surveys in 29 countries and still on going in 9 countries by using standardized methodology and pre and post-bronchodilator spirometry to know the prevalence of COPD and risk factors in people aged 40 years and above.[28] BOLD reported poor lung function than in previous studies, with a prevalence of COPD grade 2 or higher of 10.1% overall and substantial prevalence of 3-11% among never smokers.[29] Similar results were found in north and sub Saharan Africa and in Saudi Arabia.[30, 31]

Based on BOLD and other studies, the numbers of COPD cases were estimated to be 384 million in 2010, with a global prevalence of 11.7%.[32] Annually around 3 million deaths are estimated to occur globally because of COPD and this is estimated to increase to 4 million by 2030, essentially because of increasing smoking rates in developing countries and increasing age in developed and high economic countries.[33-35]

Moridity, Mortality, Economic And Social Burden: morbidity from COPD includes physician visits, emergency department's attendance and hospitalization. Morbidity increases with age. This may be affected by other co-morbid conditions like cardiovascular, diabetes and musculoskeletal abnormalities, all are associated with smoking, ageing and COPD.[36]

Under-recognition and under-diagnosis of COPD reduces accuracy of mortality data. Most of the time COPD is the primary cause of death, often it is either written as contributory factor or omitted from the death certificate.[37] In 2011, COPD was the 3rd leading cause of death in united state.[38] Expanding smoking and decreased mortality from other disease increase in age and scarcity of effective disease modifying therapies has led to this increase in COPD - related mortality.

COPD also is a significant economic burden. About 6% of the total European Union health care budget expenditure is on respiratory problems with 56% of it is constituted by COPD.[39] Direct cost of COPD is 32 billion dollars and indirect cause is 20.4 billion dollars in the United States.[40] Indirect effect on workplace and home productivity of COPD in developing countries is more important than direct medical cost. COPD may cause loss of two people from workplace, ne patient and the other care giver.[41] DALYS is the sum of years lost because of pre-mature mortality and years of life lived with disability, adjusted for severity of disability. The global burden of disease (GBD) found that COPD is main contributor of mortality and morbidity throughout the world. In 2013 COPD was ranked 5th leading cause of DALYS lost.[42] In the United States COPD is the second leading cause of reduced DALYS.[43]

Great effort is needed to reduce the increasing prevalence of COPD and to overcome the risk factors especially smoking and workplace exposure to different irritants causing COPD. Legislation and public awareness campaign can apply brake to this rising problem in the world.

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