



International Journal of Innovative Pharmaceutical Sciences and Research

www.ijipSR.com

EARLY LIFE FACTORS ON THE DEVELOPMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A REVIEW

Rincy P J*, K. Krishnakumar, L. Panayappan, Meppil Baby

Department Of Pharmacy Practice, St .James College of Pharmaceutical Sciences, Chalakudy,
Kerala, St .James Hospital Trust Pharmaceutical Research Centre (DSIR Certified) Chalakudy,
Kerala, INDIA

Abstract

Chronic obstructive pulmonary disease is partly reversible and frequently progressive obstruction of the airways that is allied with inflammation . The origin of Chronic obstructive pulmonary disease is at early stages of life, but it appear later on. An apparent understanding of deep-rooted cause of early life factors are prenatal and postnatal. Prenatal include maternal smoking during pregnancy, intrauterine growth restriction and low birth weight . Postnatal include Chronic lung disease of prematurity, Postnatal growth and nutrition, exposure to environmental tobacco smoke, Environmental pollution and Childhood respiratory illnesses^[1]. This review article is focused on the origin of Chronic obstructive pulmonary disease is at the early stages of life.

Keywords: Chronic obstructive pulmonary disease.

Corresponding Author:

Rincy P J

Department of Pharmacy Practice,
St .James College of Pharmaceutical Sciences,
Chalakudy, Kerala, INDIA

E-mail: stjamespharmacyproject@gmail.com



INTRODUCTION

Chronic obstructive pulmonary disease is the fourth leading cause of death for the World but is forecasted to be the 3rd death cause by 2020 [1]. Chronic obstructive pulmonary disease is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and alveolar abnormalities usually caused by significant exposure to noxious particles or gases [GOLD 2017] [2]. At present there is no curative therapy and treatment is commonly palliative. The main contributor to the global burden of disease is people above 40 years. The origin of Chronic obstructive pulmonary disease is at the early stages of life.

Normal lung development

Lung development is controlled by numerous mechanical and biochemical factors, which commences in utero and continues through different stages to adolescence and early adulthood [3].

The majority of structural modifications take place during the fetal life and first few years after birth. Following to birth lung size increases with body size. It is promoted by age, sex and ethnicity. The normal lung volumes are attained over 22 years in males and lightly prior in females.

Maternal smoking during pregnancy

Maternal smoking during pregnancy is a risk factor for the development of Chronic obstructive pulmonary disease [4].

It is potentially preventable insult to the developing lung and a major cause of unusual death in infants, LBW, preterm delivery and intrauterine growth restriction (IUGR). The prenatal exposure to tobacco smoke impairs lung development, increases respiratory disease and reduces infants lung function in early adulthood.

Low birth weight (LBW)

The two main causes for a baby to be born at a low birth weight are preterm delivery and IUGR. This occurs when a baby does not grow well during pregnancy. Factors responsible for IUGR include birth weight less than tenth centile for gestational age, impaired trans-placental supplies of oxygen or nutrients to the fetus, which also associated with maternal smoking or pregnancy induced hypertension. Premature babies are physically immature and very small. They are at risk for Chronic obstructive pulmonary disease [5].

Chronic lung disease of prematurity

Preterm delivery that occurring before 37 weeks of gestation, they often have breathing problems because their lungs are not fully developed.

Reduced maximal attained lung function individuals are at increased risk for the development of Chronic obstructive pulmonary disease. Bronchopulmonary dysplasia (BPD) is a chronic lung disease of infants and children , involves abnormal development of lung tissues. These individuals having increased risk of developing COPD in their future life [6].

Postnatal growth and nutrition

The lungs are the one of the last organ developed during the prenatal stage. Childhood is a really important period for healthy lung development. In the first six months of child's birth they quickly develop a lot of air sacs. Lung volume and airflow will increase as the thorax develops, lung growth terminate in young adulthood and lung function leave stable for about 10 years then the lung function gently decline. The impact of postnatal nutrition on lung development is chiefly pertinent in preterm infants, due to impaired nutrition and growth which result in reduced lung function and increased risk of respiratory morbidity in survivors during childhood and adolescence. Various evidence from different observational studies shows high influence of diet in the development of asthma and COPD.

Postnatal exposure to environmental tobacco smoke

Secondhand smoke (SHS) is also known as environmental tobacco smoke. Same harmful chemicals are inhaled during SHS. It contains nicotine and harmful cancer causing chemicals. This increases the risk of respiratory illness and reduced lung function of young children [7].

Environmental pollution

The developing lung is immensely susceptible to damage from exposure to environmental pollutants, which include acute and chronic exposure. Exposures to organic and inorganic dusts, chemical agents and fumes are also risk factors for COPD. Passive exposure to cigarette smoke, that is environmental tobacco smoke may also give rise to respiratory symptoms and COPD by flourishing the lung's total burden of inhaled particles and gases [8].

Childhood respiratory infections

Children having history of recurrent or severe childhood respiratory infection will have reduced lung function and increased respiratory symptoms in adulthood [9]. Various studies reported that respiratory infection during childhood may be a risk factor for COPD . Respiratory syncytial virus (RSV) infection is associated with increased like-hood of subsequent wheezing and these

type of infections in early life was found to be a strong risk factor for asthma in later life. The childhood asthma causes irreversible airflow restriction; it is an extreme risk for COPD.

CONCLUSION

COPD is a frequent cause of illness and death. Many studies revealed that early-life factors play a significant role in the later outbreak of disease such as asthma and COPD. A better understanding of the long-term effects of early life factors on subsequent development of respiratory disease is necessary to reduce the burden of COPD. The preterm infants may be at immense risk of COPD. Take efforts to decrease exposure to air contaminants during pregnancy and childhood and prevention strategies for childhood asthma can effectively decrease the risk of COPD.

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