



## EDITORIAL

# What Affects Chronic Obstructive Pulmonary Disease in Korea?

Chronic obstructive pulmonary disease (COPD) is a common respiratory disease in adults. COPD is characterized by dyspnea due to limited airflow. COPD is likely to become the third leading cause of death in the world by 2020 [1]. Advanced COPD is associated with severe dyspnea accompanied by coughing, sputum and fatigue, as well as cardiovascular complications such as cardiac insufficiency, which require constant oxygen supply and limit daily activities, ultimately resulting in depression or decreased quality of life [2].

The main risk factor for COPD is smoking [3]. However, COPD among non-smokers has recently increased and there are approximately 50 million non-smoking COPD patients worldwide [3], and recent studies have showed that the prevalence of COPD among non-smoking South Koreans is 7.1 to 8.2% [4,5].

Exposure to cigarette smoke from secondhand smoking can affect the bronchus and limits airflow [5]. The risks of respiratory infection also vary depending on the rate of practicing health-related activities or the level of occupational exposure to hazardous substances [4]. A decreased level of immunity or pulmonary compliance due to increased age may also lead to increased risk of respiratory infections or deterioration of respiratory function [4]. Educational and financial status affect acquisition of health-related knowledge and information, as well as access to health services and nutritional intake; hence, these factors may also affect the occurrence of pulmonary infection for those living in an environment exposed to exhaust gas [1]. Dust, coal, and heavy metals such as organ cadmium and aluminum, mercury, lead may cause airflow restriction [6–10]. Poor nutritional intake and stress affect energy balance and deteriorate immunity, thereby reducing muscle strength and causing dyspnea [10,11]. Differences in physical activities lead to changes in respiratory muscle strength, intramuscular protein, and weight, and may cause dyspnea in daily life as well [12]. Anemia increases muscle fatigue due to oxygen deficiency in the blood, and causes difficulties in physical activities and dyspnea [13]. A medical history of lung disease or pulmonary tuberculosis may impact airflow and cause

airway inflammation or pulmonary fibrosis, thus resulting in airway changes [14].

South Korea is greatly affected by environmental influences from China, which is the largest emitter of air contaminants in Northeast Asia. Despite the severity of air pollution or the increase in the number of non-smoking COPD patients, not many studies have been conducted to investigate factors that play a major role in the occurrence of the disease among non-smokers. A few previous studies identified the factors associated with COPD among non-smoking adults as gender, age, socioeconomic status and educational background, occupational exposure to dust, body mass index (BMI), and history of pulmonary tuberculosis or asthma [15].

The Korea National Health and Nutrition Examination Survey (KNHANES) includes pulmonary function test and the variables related to respiratory problem. It provides data that are representative of the population since the sample size is large. Therefore, the present study used data from the 5th KNHANES from 2010 to 2012, to determine the prevalence and to identify the risk factors of COPD among non-smoking adults. Ultimately, this study is expected to contribute to efforts for prevention of COPD for non-smoking adults, which should in turn improve their quality of life by preventing physical, social, and financial loss.

In the current issue of *Osong Public Health and Research Perspectives*, a study examined the prevalence of COPD among non-smoking adults, and to investigate the risk factors that affect disease occurrence and is diagnosed on the basis of a forced expiratory volume in 1 second value of less than 0.07 ( $FEV_1/FVC < 0.07$ ) in the pulmonary function test (PFT). The data from the 5th Korea national health and nutrition examination survey (KNHANES) was utilized, and 5,489 non-smoking adults aged between 40 to 79 years with diagnosable  $FEV_1/FVC$  were selected as the subjects of this study.

The authors found that the prevalence of COPD in non-smokers was observed to be 6.9%. The development of the COPD showed statistically significant difference among groups; males showed about 2.54 times (95% CI:1.410-146.612) higher rates compared to

females, subjects aged 70-79 showed about 3.08 times(95% CI:1.823-11.437) higher rates compared to those aged 40-49, subjects whose education level was elementary school or less showed about 5.36 times(95% CI:1.341-21.393) higher rates compared to those who are college or more, and subjects who are middle school showed about 4.72 times(95% CI: 1.374-16.217) higher rates compared to the college or more.

The authors have concluded that that development of the COPD in non-smokers reach significance. For the prevention of the disease, it is necessary to identify COPD-related risk factors in men and the elderly and provide appropriate nursing intervention. Furthermore, it is to develop health-related education programs for those with low educational background to promote the improvement of lung health [16]. This study can be helpful to public health decision makers in Korea as a basic data.

## References

- Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. *The Lancet* 1997 May;349(9064):1498-504.
- Lee KJ, Shim JJ. Early detection and early treatment of COPD. *Korean J Med* 2009 Oct;77(4):415-21.
- Yin P, Jiang CQ, Cheng KK, et al. Passive smoking exposure and risk of COPD among adults in China: the Guangzhou Biobank Cohort Study. *The Lancet* 2007 Sep;370(9589):751-7.
- Lee SJ, Kim SW, Kong KA, et al. Risk factors for chronic obstructive pulmonary disease among never-smokers in Korea. *Int J COPD* 2015 Mar;10:497-506.
- Lee SH, Hwang ED, Lim JE, et al. The risk factors and characteristics of COPD among nonsmokers in Korea: an analysis of KNHANES IV and V. *Lung* 2016 Apr;194(3):353-61.
- Diaz-Guzman E, Aryal S, Mannino DM. Occupational chronic obstructive pulmonary disease: an update. *Clin Chest Med* 2012 Dec;33(4):625-36.
- Berry CE, Wise RA. Mortality in COPD: causes, risk factors, and prevention. *Int J Chron Obstruct Pulmon Dis* 2010 Sep;7(5):375-82.
- Menezes AM, Peres-Padilla R, Jardim JR, et al. Chronic obstructive pulmonary disease in five Latin American cities (the PLATINO study): a prevalence study. *The Lancet* 2005 Nov-Dec;366(9500):1875-81.
- Chung HK, Chang YS, Ahn CW. Effect of blood lead levels on airflow limitations in Korean adults: finding from the 5th KNHNES 2011. *Environ Res J* 2015 Jan;136:274-9.
- Lancaster T, Stead L, Silagy C, et al. Effectiveness of interventions to help people stop smoking: findings from the Cochrane Library. *Br Med J* 2000;321(7257):355-8.
- Rastogi SK, Gupta BN, Husain T. Respiratory symptoms and ventilatory capacity in metal polishers. *Hum Exp Toxicol* 1992 Nov;11(6):466-72.
- Kang KJ, Kim MH, Hwang SK. Self-Care, Symptom Experience, and Health-Related Quality of Life by COPD Severity. *J Korean Acad Adult Nurs* 2008 Feb;20(1):163-75.
- Moon JH, Ok JS, Ahn KO. The effect of 12 week exercise training on cardiopulmonary and muscular function in chronic obstructed pulmonary disease patients. *The Official Journal of the Korean Academy of Kinesiology* 2013;15:97-108.
- Stern DA, Morgan WJ, Wright AL, et al. Poor airway function in early infancy and lung function by age 22 years: a non-selective longitudinal cohort study. *The Lancet* 2007 Sep;370(9589):758-64.
- Zhou Y, Wang C, Yao W, et al. COPD in Chinese nonsmokers. *Eur Respir J* 2009;33:509-18.
- Oh HY, Lee YE. Prevalence and Risk Factors of Chronic Obstructive Pulmonary Disease among Nonsmokers: Fifth Korea National Health and Nutrition Examination Survey (2010-2012). *Osong Public Health Res Perspect* 2016 Dec;7(6):385-92.

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