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Case Report

COPD Due to Occupational Biomass and Grain Dust Exposure: Case Report

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Abstract

Chronic Obstructive Pulmonary Disease(COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and air flow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to harmful particles or gases. The main risk factor for COPD is smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute. Besides exposures, host factors predispose individuals to develop COPD. These include genetic abnormalities, abnormal lung development and aging. Our case is a 34 years old, male patient with complaints of dispnea with exercise. No pathological findings were found on physical examination. There was no history of smoking. It was learned that the patient worked as a baker for a total of nine years in the occupational history. While working in the bakery, there was biomass exposure and graindust exposure as indoor air pollutants. A mild degree of obstruction was detected in the pulmonary function test. Bronchodilator reversibility response was negative.There was no abnormality on the chest X-ray and High-resolution computed tomography (HRCT). The α-1 antitrypsin and cystic fibrosis sweat test levels were within normal limits, and the cystic fibrosis gene test was negative. Occupational COPD due to occupational biomass and grain dust exposure was considered in the patient who had no smoking history and congenital risk factors. This case, which is currently working in the weapons industry but has been exposed to occupational COPD risk factors in the past, shows the importance of taking a detailed occupational history while taking an anamnesis.

Keywords: Biomass, COPD, occupation, grain dust

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COPD is a common, preventable and treatable disease characterized by persistent airflow obstruction due to airway and/or alveolar abnormalities and respiratory symptoms, usually caused by severe exposure to harmful particles or gases.[1] A majority of patients have etiologic factor such as active or passive cigarette smoking. Although smoking is the most commonly studied COPD risk factor, it has been shown that chronic airflow obstruction may also occur in non-smokers.[1] In the etiopathogenesis of COPD; recurrent lower respiratory tract infections, past tuberculosis infection, asthma and airway hyperreactivity, chronic bronchitis, poor social economic conditions, malnutrition, intrauterine growth defect can be counted of non-smoking risk factors.[2] Epidemiologic data show that 19% of COPD patients are caused by harmful gases and particles exposed at the workplace.[3] We present our case because of young age, non-smoking history and occupational exposure.

Case Report

A 34-year-old male patient had complaint of dyspnea with exercise. The patient was directed at out patient of occu-

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pational diseases upon detection of mild obstruction in the pulmonary function test at the work place periodic examination. No pathological findings were found on physical examination. There was no history of smoking. For the last 2 years, it has been learned that the patient working in the field of bluing of the weapon industry worked as a baker for a total of nine years in the detailed ex-work history. While working in the bakery, there was biomass and grain dust exposure as indoor air pollutants.Spirometry showed mild obstructive pattern; FEV1 3.16 L %70, FVC 4.74 L (%87), FEV1 / FVC %66.7. CO transfer (DLCO) was 3.96 (82%). A post bronchodilator test was negative; FEV1 3.09 L %75 (pre), 3.29 L %81 (post). No abnormality was detected in chest X-ray and HRCT (Fig. 1). The α-1 antitrypsin level was 146 mg/dL (reference range: 90-200 mg/dL) and the cystic fibrosis sweat test was 27 mmol/L (reference range: 0-40 mmol/L) at the normal limits. No mutation was detected in the cystic fibrosis gene mutation screening test. Occupational COPD was thought depending on exposure to occupational biomass and grain dust in a patient with no smoking history and congenital risk factors of COPD.

Discussion

COPD is one of the leading causes of morbidity and mortality worldwide.This situation causes significant and gradually increasing economic and social burden. It is estimated that there are 3.2 million deaths from COPD worldwide.It is observed that occupational exposures are responsible for 11.1% of these deaths.[4,5] Although the prevalence of COPD is generally directly related to the prevalence of smoking, occupational exposure, outdoor and indoor air pollution are among the main risk factors in many countries. Non-smoking risk factors continue to be a problem in developed countries as well as in developing countries. [2] Occupational exposures for COPD include grain farming, animalfarming, dust exposure, chemicalexposure, indoor and outdoor air pollutants. Especially in grain farming, grain dust and use of organic fuels such as wood and coal among indoor air pollutants is thought in the foreground. [6] A meta-analysis has shown that biomass smoke is associated with an increased risk of COPD.[7] If COPD is detected in a person with occupational exposure and the person is also on smoking, it is difficult to determine whether the present COPD is due to smoking or occupational exposure.[8] However, due to the fact that there are no smoking history and congenital causes are excluded in the present case, occupation history in the etiology of COPD has come to the forefront. Because of this, the occupations he has worked to date and the occupational risk factors he was exposed to were questioned. This case, which is still working in the arms industry but has been exposed to occupational COPD risk factors in the past, shows the importance of taking the detailed occupational history while taking an anamnesis.

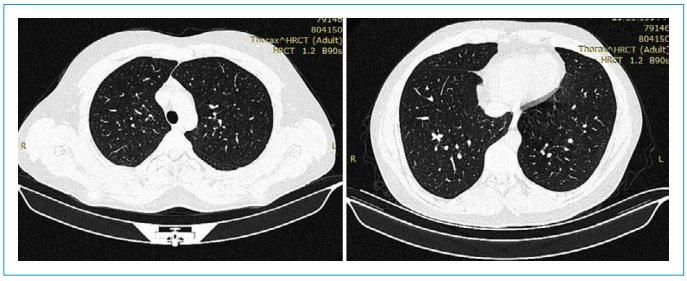


Figure 1. Thorax HRCT.

Disclosures

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying radiologic images.

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Conflict of Interest: None declared.

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