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Case Report Of COPD In Non-Smoker: Biomass Exposure As An Emerging Risk Factor.

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of mortality. The global initiative for chronic obstructive lung disease (GOLD) has classified COPD as 'a disease state characterized by persistent airflow limitation'. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases. Active smoking is the major risk factor for COPD worldwide. Although smoking remains the predominant risk factor, it needs to be emphasized that prevalence of COPD in non-smokers suggests the existence of other risk factors such as passive smoking, occupational exposure, and indoor air pollution. Here we discuss a case of a 60 year old female patient who presented with complaints of cough with expectoration and shortness of breath grade 2 MMRC . chest xray showed increased bronchova scular markings. Patient had history of exposure to biomass fuel. Patient was diagnosed as a case of COPD based on clinical examination, radiological findings and spirometry.

Keywords: COPD, non-smoker, biomass, risk factor.

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INTRODUCTION

Chronic obstructive pulmonary disease is a common, preventable and treatable disease that is characterised 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.It is the 4th leading cause of mortality.

COPD occurs worldwide, but it is a major health problem principally in socities where cigarette smoking is common. The average life span extends into the 6th decade. Although COPD predominantly occurs in smokers, non smokers also develop COPD. In a survey of copd deaths 16.7percent of individuals who died with COPD were never smokers. In undeveloped countries, burning biomass for heating and cooking results in COPD among non-smokers. COPD has a prevalence of 4-10 percent in adults in populations in whom lung function has been measured.

Active smoking is the major risk factor for COPD worldwide, and the risk attributable to active smoking in COPD varies from 40 to 70% according to the country.

Recently, exposure to biomass smoke resulting from household combustion of solid fuels has been identified as an important risk factor for COPD, with rural women in developing countries bearing most of this disease burden. In developing countries such as India COPD due to non-smoking causes account to 30-50% of all COPD cases. In addition to respirable particulate matter, biomass combustion results in high levels of pollutants such as carbon monoxide, oxides of nitrogen and sulphur, formaldehyde, benzo(a)pyrene, and benzene that are a major source of respiratory irritants in the etiopathogenesis of COPD .

CASE DISCUSSION

A sixty year old female , housewife was admitted in the respiratory ward with history of cough with expectoration, shortness of breath(grade 2 MMRC) for past3 months. Expectoration was mucoid in nature. Patient had no fever/no loss of weight/ loss of appetite. No h/o orthopnoea, PND, chest pain. Patient had recurrent episodes of respiratory infections for the past 5 years. Patient denies prior history of ATT. She is not a known diabetic/hypertensive. Patient is non smoker. Patient is a house wife who had exposure to biomass fuel for more than 35 years.

On examination patient had saturation 98% in room air. other vitals were stable.

On auscultation, normal breath sounds present. bilateral rhonchi and Fine Crepitations were heard on bilateral infrascapular areas. Cardiovascular systems and other systems normal.

Blood invesigations were within normal limits.ECG was normal. Chest xray showed increased bronchovascular markings and flattening of diaphragm. sputum for acid fast bacilli was negative. sputum culture showed growth of normal comensals. spirometry was done. results revealed fev1/fvc less than 0.7%and fev1 less than 0.8%. Post bronchodilator reversibility did not show any improvement in fev1.Patient was diagnosed as a case of COPD based on clinical presentation, examination, radiological findings and spirometry.

Patient was treated with antibiotics and bronchodilators. Patient improved symptomatically.

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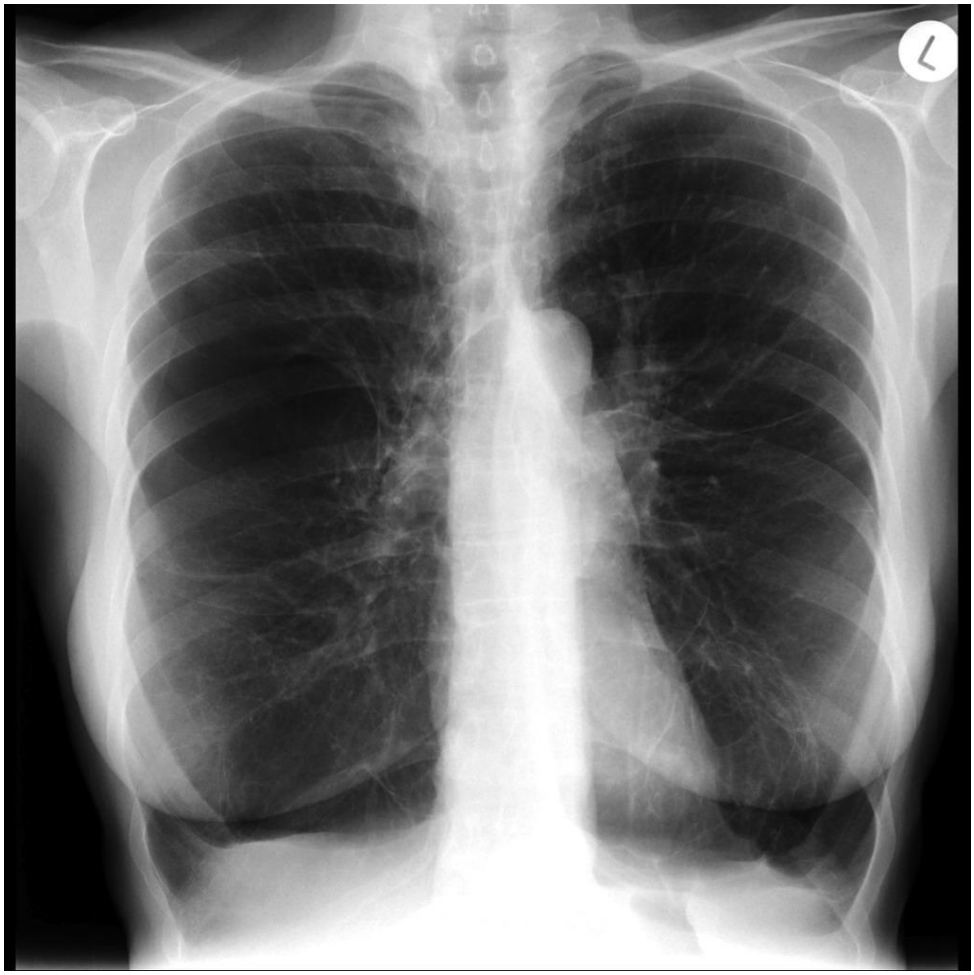

DISCUSSION

This patients presented with cough with mucoid expectoration and shortness of breath with previous history of exposure to biomass and recurrent episodes of respiratory infections. According to GOLD guidelines 2017, the general diagnostic criterion of GOLD guidelines include clinical and radiological criteria. The criterion includes exposure of biomass and recurrent episodes of respiratory infections.

Potential risk factors for COPD include tobacco smoking, occupational exposure, air pollution, childhood respiratory infections, low socio economic status, genetic factors.

Burning biomass fuel such as wood, cow-dung and crop-residues leads to release of air pollutants like SO2, CO, NO2, formaldehyde and particulate matters smaller than 10 micron in size (PM10) in the ambient indoor air. Chronic exposure to these pollutants has been shown to lead to COPD. This is especially worrisome considering the fact that more than 70% of Indian households rely on biomass fuel for domestic purposes such as cooking and heating. Recent data suggests that the inflammatory load in COPD caused by exposure to biomass fuel is similar to that caused by exposure to tobacco smoke.

A large number of mainly cross-sectional and case-control studies have found association of exposure to solid fuel smoke with COPD, chronic bronchitis, chronic airway disease, and airflow obstruction, especially in women. The overall risk of COPD in women exposed to indoor air pollution from domestic solid fuel use, especially wood, was consistently higher than in men who were likely less exposed

The use of biomass fuels, mainly wood, has been also associated with an impairment of pulmonary function. Mild to moderate reductions of FEV1/FVC, FEV1, FEV1%, PEF, and FEF25–75 have been associated with the exposure to indoor biomass burning in cross-sectional studies. Other studies, mainly hospital based

case-control studies, confirm that people exposed to biomass smoke have a high risk for developing airflow obstruction with significant reduction of FEV1 and FEV1/FVC [1-12].

This case of a COPD patient has been discussed here to emphasize that there are risk factors beyond tobacco smoking in development of COPD .Exposure to biomass fuel remains as a potential threat as a COPD risk factor to females in the developing countries.

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