

Popcorn lung - Report of a rare case and its significance in a coffee-growing district of Kerala

Sir,

This is with reference to a case of bronchiolitis obliterans who presented to my outpatient department. A 52-year-old female, agricultural worker, presented with a history of cough and breathlessness for the last 10 years. Breathlessness was progressive with few hospital admissions due to exacerbations. There was no history of childhood asthma or family history of asthma. She is a nonsmoker and is exposed to biomass fuel. She used to work in her own coffee estate doing all sundry works since the age of 18 years along with other family members. The family used to roast coffee beans and grind to make coffee powder at home for their personal use. The patient was diagnosed to have bronchial asthma and is on dust powder inhalation of a combination of budesonide and formoterol. The patient had partial improvement with this treatment.

Because her clinical presentation does not match with either asthma or chronic obstructive pulmonary disease (COPD), she was admitted for a reassessment. Her blood routine, blood sugar, and renal function tests were normal. X-ray chest posteroanterior view showed hyperinflation and reticular opacities distributed mainly in both mid and lower zones [Figure 1]. Her spirometry revealed a normal forced expiratory volume in 1 second (FEV1), forced vital capacity (FVC), and FEV1/FVC ratio. However, maximal midexpiratory flow (MMEF) or forced expiratory flow (FEF) of 25%–75% showed considerable reduction, suggesting a small airway abnormality. High resolution computed tomography (HRCT)

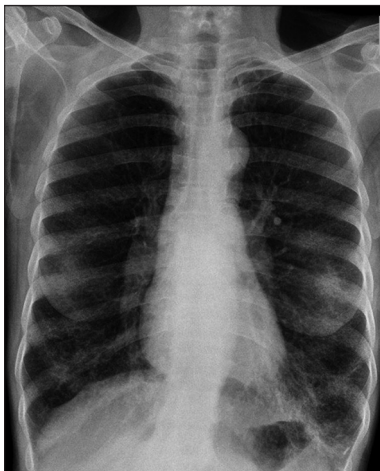


Figure 1: X-ray chest posteroanterior showing hyperinflation and reticular shadows bilaterally

thorax revealed reticular shadows, few nodular shadows, and air trapping. Tree in bud lesions were also seen suggestive of respiratory bronchiolitis [Figure 2]. Confirmation of diagnosis with a lung biopsy was suggested, but the patient did not favor any invasive procedure. The clinical and radiological presentation resembled that of “Popcorn Lung” reported in workers of a microwave popcorn plant in Missouri in 2002.^[1] This was caused by a flavoring agent termed diacetyl (2,3-butanedione) which is used to give the popcorn a buttery taste.^[2] Later, it was reported that this flavoring agent is extensively used in e-cigarettes, favoring the development of this condition among those who use e-cigarettes. Further, it is proved that this chemical is a natural byproduct in coffee-roasting and coffee-grinding processes.^[3,4] Hence, unacceptable levels of diacetyl in these units may cause popcorn lung. In their report, the Centers for Disease Control and Prevention (CDC) confirmed that occupational exposure to diacetyl and a related compound, 2,3-pentanedione, can cause bronchiolitis obliterans and loss of lung function. The CDC also reported that these potentially harmful chemicals were found at higher-than-expected levels at some coffee-processing facilities.^[5] Popcorn lung (bronchiolitis obliterans) often is associated with symptoms of cough and shortness of breath, similar to that seen in patients with COPD and asthma. This pathology is irreversible and progressive, and there is no definite treatment. Diagnosis is often delayed due to nonspecific clinical features and is initially treated as asthma or COPD. Lung tissue biopsy is necessary to confirm the diagnosis of bronchiolitis obliterans.

A rare case of bronchiolitis obliterans similar to “popcorn lung” is reported here. The clinical significance is that workers exposed to diacetyl, which is a natural byproduct in coffee processing, develop this disease, and a clinical suspicion among coffee plant workers presenting with

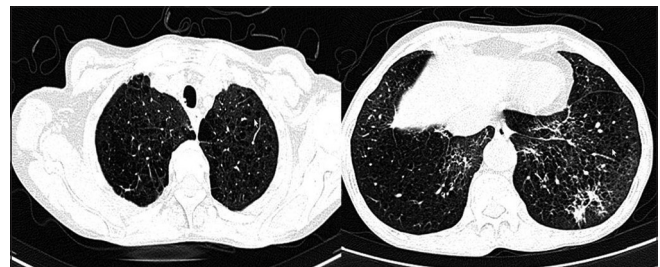


Figure 2: High-resolution computed tomography thorax (upper and lower lobe cuts) showing air-trapping, reticular, nodular shadows and tree in bud lesions bilaterally

symptoms of obstructive airway disease will help in early diagnosis. Wayanad district of Kerala state is a moderately high-altitude farmland with coffee plantations and coffee-processing units. An epidemiological research to detect the level of these chemicals in coffee-processing units and to assess its health hazard among workers may help establish a causative relationship.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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