

Chronic cannabis abuse causing marijuana lung – A young man’s agony

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(Key words: marijuana lung, cannabis abuse, emphysema, pneumothorax, smoking)

Introduction

Cannabis is the most widely used illicit drug among adolescents and young adults [1]. There are already published case reports describing the adverse effects of cannabis use on lungs of young adults in the third and fourth decades of their life. We present the youngest patient to demonstrate extensive lung damage due to “Marijuana lung”, presenting in his teenage years.

Case report

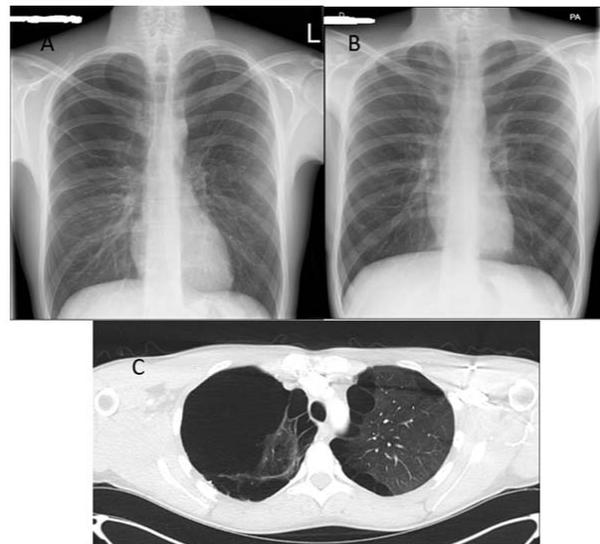
An eighteen-year-old patient was referred following an incidental finding of an abnormal Chest X-ray, performed following a road traffic accident. On further inquiry it was found out that he was a chronic cannabis user for the last 6 years in which he used 6 joints of cannabis per day. In addition, he was an ex-smoker having smoked 5-6 cigarettes per day until three years prior. He denied a history of a chronic cough or wheezing but later admitted to struggling with insidious onset exertional dyspnoea.

On examination he was slim and tall. There was no clubbing, nicotine stains, cyanosis or peripheral stigmata of chronic liver disease. It was noted to have a hyperextensibility of wrist and small hand joints and hyperelasticity of the skin. His trachea was central and there was reduced air entry with hyperresonance in the bilateral upper zones.

His CXR showed right upper zone bullae with hyper-expanded lung fields which was not evident on a CXR done 9 months back. This was followed by a high-resolution CT Thorax (HRCT) which showed upper zone limited paraseptal emphysema with bilateral upper lobe bullae more prominent in the right lung. He was further investigated with alpha-1 antitrypsin levels which were within normal range and his connective tissue screening was negative. Further evaluation with lung function

showed FEV1 3.12L (58%), FVC 5.82L (89%), FEV1/FVC 64%. 2D echo revealed normal cardiac function.

Based on upper lobe predominant paraseptal emphysema with upper lobe predominant bullae and absence of cystic lesions and nodules, and his exposures, a diagnosis of “Marijuana lung” was made. He was given cessation advice but despite this during follow up was noted to have progressive exertional breathlessness on exertion after 8 months from initial presentation. Repeat HRCT showed progression of the disease. Based on lung functions, size of the bullae and progression of the disease, he was referred to cardiothoracic surgeons and bullectomy was planned.



A,B - CXR-PA showing hyper-inflated lungs with right upper lobe hyperlucency with absence vascular markings suggestive of a bulla. Transverse fissure has shifted upwards showing upper lobe volume loss. CXR on the right taken 9 months before, does not show the above features. C-HRCT showing upper lobe predominant paraseptal emphysema with right sided bulla formation.

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Discussion

Cannabis use is associated with several complications including development of bullous lesion, emphysema, pneumothorax, tendency to pulmonary infections and development of lung cancer. There are number of case reports and case series describing the associations and the effects, although evidence of direct linkage is sometimes limited. It has also been shown that the type of cannabis, and the method of smoking is a decisive factor of adverse effects of this agent on the lung [4].

There is emerging concern that regular cannabis smoking may lead to a rapid development of chronic obstructive pulmonary diseases, although there is still dispute as to whether cannabis smoking contributes to the development of emphysema. This case is unique as he is the youngest patient reported with a marijuana lung so far, with severe changes that appear to be directly attributable to the effects of marijuana itself. He had limited exposure to tobacco and was limited to marijuana use for the last three years with progressive CXR changes noted during the last year.

Marijuana lung is associated with a specific pattern of pulmonary function tests. It has been shown, smoking marijuana containing substances produce acute bronchodilation for a duration of up to 2 hours [5]. Interestingly this effects has already been identified in the past, especially in the 19th century in which marijuana was used to treat asthma. Chronic cannabis use has been associated with large airway dysfunction leading to airflow obstruction and hyperventilation. Because of this, cannabis use is associated with apical predominant emphysema with large bullae formation which is called the “marijuana lung”. These patients usually present with a pneumothorax, usually due to a bullous rupture.

A characteristic lung function pattern has been detected. There is an increase in functional vital capacity (FVC), total lung capacity, residual volume with a relatively normal forced expiratory volume in 1st second (FEV1). This leads to a reduction in FEV1/FVC ratio mimicking an obstructive feature but volume assessment will aid the diagnosis.

Conclusion

Marijuana use is associated with a spectrum of lung diseases. Detailed screening and assessment should be arranged even in asymptomatic patients as there can be advanced sub clinical parenchymal pathology.

Authors' contributions

All the authors were involved in the clinical management of the patient and SAW and MA did the drafting of the manuscript. YH critically evaluated and revised the draft.

Disclosure statement

We have no conflict of interest to declare.

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Patient consent

All the information regarding the patient was completely anonymized. We have obtained the written consent for the publication of the article.

Abbreviations

CXR - Chest X-ray

HRCT - High resolution CT

FEV1 - Force expiratory volume in 1st second

FVC - Forced vital capacity

FEV1/FVC - Ratio between Force expiratory volume in 1st second and Forced vital capacity

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