Case Report

Chronic use of *Datura stramonium* cigarettes and late diagnosis of bullous emphysema in a smoker of marijuana and tobacco

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ABSTRACT

Unconventional inhaled therapy as a treatment for respiratory diseases became very common during the 19th century. Here, we present the case of a 52-year-old patient who smoked *Datura stramonium* cigarettes, tobacco cigarettes, and cannabis, with only an early diagnosis of asthma. The patient was admitted to our hospital with acute respiratory syndrome, characterized by worsening dyspnea, cough, and an acute episode of dyspnea and chest tightness. The combined chronic use of both *D. stramonium* cigarettes and cannabis masks the progression of chronic obstructive lung damage due to tobacco cigarette smoking because of the lack of clinical signs and symptoms.

1. Introduction

*Datura stramonium* is an herbaceous plant known for its hallucinogenic, dose-dependent, potentially lethal, and anticholinergic effects (one of the reasons it became a new drug of abuse). Clinically, signs and symptoms include hyperthermia, skin redness, speech disorder, tachycardia, disorientation, agitation, decreased intestinal sounds, dry skin and mucous membranes, visual defects, urinary retention, and hallucination [1]. During the 19th and 20th centuries, inhalation therapy for respiratory diseases, especially asthma, became widespread globally. Medical care, cannabis, potash, tobacco, and stramonium have become the main treatments for asthma due to the increasing trend of smoking opium and cannabis alone or with tobacco [2]. Stramonium has become a commonly used drug for people suffering from respiratory disease; it causes toxicity not only because of the anticholinergic alkaloid substances, such as atropine and scopolamine, but also because of the effects of smoking on the airways. Furthermore, as highlighted by a study published in the 1980s on six healthy volunteers, the anticholinergic effects of herbal asthma cigarettes, because of the atropine-like alkaloids they contain, despite the risks derived by the side effects and the variability and unpredictability of the amount of active drugs that reach the bronchial tree, allow a 41.2 L/min increase in peak expiratory flow rate (PEFR) 30 min after smoking, an effect similar to ipratropium inhaler therapy [3].

Nowadays, scopolamine has also emerged as an abused and diverted drug [4]. Anticholinergic drugs might be abused at clinically and epidemiologically significant levels for their psychotropic effects; for...
example, to achieve high or euphoria, to elevate energy and mood, increase social interaction, or induce an anticholinergic toxic syndrome, which may feature disorientation, hallucinations, paranoia, and confusion. These clinical symptoms may assume forms of exogenous psychosis together with chronic developments [5].

Here, we present the case of a 52-year-old patient who developed severe chronic obstructive pulmonary disease (COPD) after smoking cannabis cigarettes regularly, while treating his asthma with stramonium cigarettes.

2. Case report

In 2011, a 52-year-old patient was admitted to our hospital with worsening dyspnea in the previous week and cough, acute dyspnea, and chest tightness a few hours prior to admission.

The patient was diagnosed with asthma at an early age. He had gone a long period of about 30 years without respiratory symptoms and/or limitations to his daily living activities (as defined by the Notthingham extended activities-of-daily-living scale). Dyspnea and cough presented the week before hospital admission, which a previous pulmonologist had diagnosed as emphysema and prescribed prednisone (50 mg/day), formoterol (1 puff as needed), mometasone furoate (200 μg/day), and indacaterol (150 μg).

At that time, the patient was an astrologer with a family history of asthma and had been smoking cigarettes regularly for about 30 years (17 pack-years since he was 17) and cannabis cigarettes regularly; he also smoked about three stramonium cigarettes per week from the age of 4 to 17, when he stopped because those stramonium cigarettes were no longer sold in Italy. He then started smoking 1 cigarette a week at 38, when he found D. stramonium plants near his house, started cultivating them, and continued smoking them for about 12 years.

His medical history was limited to a report of frequent bronchitis in childhood and multiple fractures of the right hemithorax due to a car accident.

Physical examination revealed a thin body (body mass index, 16.7 kg/m^2), hyperexpansion and hypo-expandability of the hemithorax, wide reduction of pulmonary sound, hyperphonesis, and bronchostenosis noises; breathing rate, 32 breaths/min; heart rate, 124 bpm; cardiac sounds, paraphonia; and blood pressure, 110/70 mmHg. Blood tests revealed increased white blood cell count (13.58 × 10^3/mm^3), predominantly neutrophils (77.4%), mild hyperproteinemia (5.6 mg/dL, reference 6.2–8.5 mg/dL), increased C-reactive protein (1.8 mg/dL, reference 0–0.5 mg/dL), and a PEFR of 200 mL/s. Blood gas analysis revealed pO_2 of 53 mmHg (reference >60 mmHg), pCO_2 of 42 mmHg (reference 35–45 mmHg) and pH 7.4 (NV 7.35–7.45).

Fig. 1. Computed tomographic images (axial thin-section scans of the chest, A-C; coronal section D) from the upper to lower lung zones illustrating widespread chronic obstructive lung disease and centrilobular emphysema with bullous emphysema over the whole lungs.
Thoracic radiography showed signs of emphysema, mostly basal and circulation redistribution. High-resolution computed tomography confirmed the presence of widespread COPD with severe centrilobular emphysema with bullous evolution over the whole lungs, along with thickening of the bronchial walls (Fig. 1).

A body plethysmography scan indicated an obstructive ventilatory defect, with a forced volume capacity (FVC) of 2.67 L (61% of the predicted value), forced expiratory volume in 1 s (FEV\textsubscript{1}) of 0.58 L (17% of the predicted value), FEV\textsubscript{1}/slow vital capacity ratio (SVC) of 0.17, total lung capacity (TLC) of 9.91 L (144% of predicted 6.90 L), a residual volume (RV) of 6.52 L (292% of predicted 2.23 L), and decreased carbon monoxide diffusing capacity at 4.6 mL/min/mmHg (16% of predicted 29.60 mL/min/mmHg). There was also a positive result in the bronchodilation test, with negative skin-prick tests for inhalant allergens.

There was no evidence of an A1-antitrypsin deficit.

Tachycardia was studied in-depth with echocardiography, which highlighted a mild delay in right conduction and an increased dimension of the left cardiac atrium, and cardiac ultrasound, which indicated mild dilatation of the right cardiac ventricle, prolapse of the mitral anterior flap, mild mitral and pulmonary valve insufficiency, and moderate tricuspid valve insufficiency. Pulmonary blood pressure was approximately 60 mmHg.

A 6-min walking test was also performed, which was interrupted after 200 m (3 min) due to dyspnea despite maintaining an oxygen saturation of 94%.

3. Discussion

These clinical features provide evidence of left heart failure due to increasing values of pulmonary blood pressure in a patient with COPD with features of emphysema.

Except for episodes of frequent bronchitis at an early age, the patient reported that he had never experienced COPD symptoms and signs, such as cough, dyspnea, shortness of breath, increased phlegm or sputum, or wheezing, and thus had never undergone radiological or functional tests that could show the progression of parenchymal and bronchial damage to his lungs.

The aim of this case report was to highlight how the potential anticholinergic capacity of regular and long-term smoking habits of D. stramonium cigarettes and other herbal asthma cigarettes can lead to a late clinical hypothesis and diagnosis of COPD by hiding typical symptoms and signs that define its clinical features.

Furthermore, another critical aspect of this case report is represented by the role of early exposure to cigarette smoking. A study published in 2018 conducted on 4089 children born between 1994 and 1996, recruited and followed from birth to 16 years of age, that analyzed maternal smoking during pregnancy and early age exposure to cigarette smoking suggested an association between reduced FEV\textsubscript{1}/FVC ratios, increased peripheral airway resistance, and adolescent smoking, and hypothesized the development of airflow obstruction from only a short duration of smoking [6].

Lastly, although different opinions have been discussed in different studies, as underlined in one review published in 2007 that analyzed 34 cases [7], short-term exposure to marijuana leads to bronchodilation, whereas long-term exposure to this risk factor leads to an increase in respiratory symptoms suggestive of obstructive lung disease.

4. Conclusions

The patient’s clinical history underlines the development of severe COPD at an early age, with a delayed diagnosis caused by the capacity of the chronic use of unconventional therapy in the treatment of bronchostenosis symptoms. Indeed, the bronchodilator action of D. stramonium cigarettes and marijuana smoke, first on their own and then in association with the D. stramonium itself, acts only on the short-term dilatation and not on the etiology of the pathology, thus disguising the typical symptoms of irreversible severe lung obstructive damage caused by chronic cigarette and marijuana smoking.

1. Clinicians must pay attention to the entire exposure and pharmacological history of patients with COPD and emphysema; sometimes, unconventional therapy could mask important symptoms and delay diagnosis.

2. Public health and regulatory agencies should work together to provide scientific and legal frameworks for a ban of harmful treatments with unproven efficacy.

Disclosure

The authors have no potential conflicts of interest regarding the content of this manuscript.

Declaration of competing interest

None.

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