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MORNING REPORT

Cannabis Implicated in a Case of Hypersensitivity Pneumonitis

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A previously healthy 40-year-old man presents with acute onset dyspnea. He has had four similar episodes over the past two months. These episodes begin with 30 minutes of dyspnea followed by an hour of diaphoresis, high fevers, and full-body myalgias. These symptoms resolve spontaneously, though the patient is fatigued for several hours afterward. The patient denies other symptoms as well as tobacco or IV drug use. Household members have not experienced similar symptoms. He has not traveled outside the Northwestern United States or internationally. He is febrile at 100.9°F, with pulse 123 bpm, BP 166/106, respiratory rate 26, and SpO2 90%. The physical exam is unremarkable except for an inspiratory bibasilar "squeak and pop" in his lungs and intermittent nonproductive cough.

Our diagnostic approach to a patient with episodic dyspnea begins with a broad differential of both cardiac and pulmonary etiologies. From a cardiac standpoint, we need to rule out acute coronary syndrome, acute decompensated heart failure, and flash pulmonary edema. Pulmonary conditions that can cause episodic dyspnea include reactive airway disease, recurrent pulmonary emboli (PE), pneumonitis, and (less likely) pneumonia. Panic attacks are also in the differential, although this would be a diagnosis of exclusion. Finally, thinking specifically about this otherwise healthy young patient, the episodic nature of acute dyspnea, fevers, and myalgias also raises the possibility of a "zebra" diagnosis, the hereditary auto-inflammatory disease Familial Mediterranean Fever. An initial evaluation would include a chest X-ray, CBC, troponin, EKG, ABG, and a D-dimer or CT pulmonary angiogram depending on the pre-test probability of a PE.

The patient previously presented to his primary care physician with these symptoms. Previous chest X-rays obtained after two prior episodes do not demonstrate any acute cardiopulmonary process. He was treated with guaifenesin then erythromycin for presumed bronchitis and atypical pneumonia, respectively. These treatments gave modest but short-lived improvement. Given the recurrent nature of these episodes, previously negative chest X-rays, unexplained hypoxemia, and the fact that a pneumonitis was on our differential, we obtain a CT chest that reveals numerous small (3 to 8 mm) ground-glass granulomatous opacities scattered throughout the lungs and some para-aortic lymphadenopathy.

The granulomas and the clinical symptoms of systemic inflammatory response syndrome (SIRS) help narrow our differential. Mycobacterial infections, fungal infections, and recurrent aspiration pneumonia can cause this pattern of lung disease. Non-infectious etiologies include hypersensitivity pneumonitis, sarcoidosis, granulomatosis with polyangiitis, talc granulomatosis, and hot-tub lung. This patient denied any travel to regions endemic to coccidiomycosis or histoplasmosis and likewise denied risk factors for TB. With a more refined differential, one needs to return to the patient and ask specific questions related to recurrent exposures that may cause hypersensitivity pneumonitis, including work exposures, pets, unusual activities, and systemic symptoms (i.e. rashes, nose bleeds, arthralgias, weight loss) associated with the vasculitides.

We obtain a CBC, CMP, UA, CK, TSH, ANA/ANCA, and D-dimer; all are within normal limits except for a slight eosinophilia to 8%. An infectious workup, including a respiratory viral panel and procalcitonin, is similarly benign.

With infectious and autoimmune pathology excluded, hypersensitivity pneumonitis is now at the top of our differential. This is typically caused by contaminated water, aerosols used in agriculture, birds, or rodents. Our patient does not have any traditional exposures on initial questioning.

On more detailed exploration of the hours preceding the episodes, he reports episodically vaping hash oil. He had purchased a new strain of marijuana and a water-based filter shortly before his first episode. He typically smokes marijuana daily with his asymptomatic wife.

We can now diagnose this patient with cannabis-induced hypersensitivity pneumonitis based on the detailed history, episodic nature, negative infectious and autoimmune work-up, and findings on CT imaging. Hypersensitivity pneumonitis occurs when an antigen elicits an inflammatory response within the lungs. In this case, contaminants in marijuana or related smoking devices can introduce antigens directly into the lungs. The patient in our case had recently started smoking from a water-based filter, which was possibly contaminated and causing his symptoms. Typical contaminants

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are Aspergillus *and other fungi, mycobacterium found in the soil and water, and agricultural chemicals like insecticides. The diagnosis is typically made by the detailed history, CT imaging, and biopsy if non-invasive testing is inconclusive. The mainstay of treatment is removal of the offending agent and a course of systemic corticosteroids.*

This patient was prescribed a short course of steroids and asked to abstain from smoking marijuana. He continues to use edible marijuana and has remained symptom-free since September 2015.

Take Home Points

1. Acute hypersensitivity pneumonitis (HP) is a challenging diagnosis due to nonspecific signs and symptoms and a large differential. A thorough history of possible exposures is essential for the diagnosis.
2. There are more than 300 known antigens that trigger HP, and novel exposures like cannabis have been described in the literature. Due to increasing popularity of recreational marijuana use and related smoking devices, cannabis-associated HP could become a more common diagnosis.
3. A thorough marijuana-use history should include the following: type of cannabis used, route of administration, storage, frequency and timing of use, and evaluation of all smoking devices, particularly those that use water.

References

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