Case Presentation

TR is a 39 year old male who presented with three days of worsening shortness of breath, productive cough of green, frothy sputum, fevers to 104.4 degrees, rigors and myalgias. He was placed on azithromycin and ceftriaxone after imaging showing a ground glass reticular pattern. He experienced worsening hypoxia and was placed on nasal cannula. He had a medical history of gastroesophageal reflux, back pain with chronic sinus infections, and allergic rhinitis. He took no medications and had no history of asthma. He was a milk truck driver by trade, frequenting farms exposed to organic and inorganic dust and hay. He didn’t smoke and had minimal alcohol intake and was HIV negative. Physical exam was significant for bilateral tonsilar exudates, positive lymphadenopathy and apical rhonchi and rales. He developed a red, diffuse, macular rash all over his body. Chest roentogram showed ground glass opacities in the upper lobes. A Chest CT revealed small bilateral pleural effusions with patchy ground glass opacifications with sparing of the lower lobes. The patient deteriorated clinically, becoming more hypoxic. No leukocytosis was noted, however, there was a 6-8% peripheral eosinophil count (eosinophilia >500 cells/mm^3) with a neutrophil predominance, ESR was 12 and CRP was 33.7 with an elevated serum IgE of 503. Bronchoscopy was performed. Clear, tenacious secretions were noted throughout the tracheobronchial tree. Bronchoalveolar lavage revealed a white blood cell count of 1.173 Tho/CMM with a 76% eosinophilia (normal <1%, eosinophilia >6%).

The differential diagnosis of acute, severe pneumonia in this patient may include: Legionella pneumonia, Severe acute respiratory syndrome (coronavirus), Mycobacterium tuberculosis, Histoplasma capsulatum, varicella syndromes such as Churg-Strauss, H1N1 Influenza, Pneumocystis carinii (immunocompetent), Chlamydia pneumoniae, Coxiella burnetti, Acute interstitial pneumonia, Lupus pneumonitis, Acute eosinophilic pneumonia, and Streptococcus pneumoniae.

Diagnostic criteria for acute eosinophilic pneumonia:

- Acute onset of febrile illness <1 month duration
- Hypoxic respiratory failure PaO2<60 mmHg or arterial oxygen saturation <90% on room air
- Diffuse alveolar or mixed alveolar-interstitial infiltrates on chest x-ray
- Bronchoalveolar lavage eosinophils >25% (with or without peripheral eosinophilia)
- Absence of parasitic, fungal, drug or other infection
- Prompt and complete response to corticosteroids
- Failure to relapse after discontinuation of corticosteroids

Radiology

The image on the left was taken on admission and shows patchy areas of increased lung attenuation in the upper lung zones with decreased lung volumes. The image on the right was taken three months after diagnosis and treatment and shows lungs that are clear bilaterally with some thickening of the pleura.

Discussion

Eosinophilic lung diseases are characterized by mixed inflammatory changes in alveolar macrophages, lymphocytes, neutrophils and eosinophils that result in lung injury. Due to the extensive differential diagnoses of alveolar and peripheral eosinophilia with pulmonary infiltrates other causes were excluded before making the diagnosis of idiopathic acute eosinophilic pneumonia (IAEP). All bacterial, viral, parasitic and fungal cultures including ascaris, legionella, mycobacterial and aspergillosis were negative. Antibiotics were discontinued and the patient was started on methylprednisolone 60mg intravenously. His symptoms improved within 24 hours and he was discharged on an oral prednisone taper for four weeks. He had no further episodes of IAEP.

Conclusions

IAEP is often triggered by inhaled exposures causing a hypersensitivity response to inhaled antigens that can cause hypoxemia, progressive dyspnea and respiratory failure. Common exposures from cigarette/cigar smoke, inhaled substances like crack/heroin, tear gas, gasoline, scotch-guard inhalation, indoor renovation work and exposures related to persons in the military or firefighters can induce this response. Certain populations such as survivors of the world trade center and military personnel from the middle east (sand exposure) may be at a particularly higher risk for this disease entity. This disease process is also associated with the effects of bioterrorism agents like anthrax. Rapid diagnosis and treatment can result in the reversal of respiratory failure and complete recovery without relapse. Secondary causes of alveolar eosinophilia with pulmonary infiltrates must be excluded. Determination of an acute versus chronic process helps determine treatment duration. IAEP can be life-threatening and is frequently misdiagnosed as severe, community-acquired pneumonia. Patients can experience septic shock with hypoxic respiratory failure requiring intubation and mechanical ventilation.

REFERENCES: