Clinical Episodes of Granulomatous Pneumonitis
Repetition during Four Consecutive Summers

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From summer to mid-autumn for four consecutive years (1974 to 1977), a 50-year-old woman barber experienced cough and exertional dyspnea with sputum production. Rales were audible at the posterior lung bases bilaterally. Her chest x-ray film showed diffuse nodular shadows, and pulmonary function studies revealed markedly decreased DCO. Open chest lung biopsy was performed and granulomatous lesions with multinucleated giant cells without central necrosis were observed. Having experienced multiple episodes for four years, she ceased to show symptoms after demolishing and reorganizing her house. This case is thought to represent the typical summer-type hypersensitivity pneumonitis, which we have subsequently found to be the most prevalent form of hypersensitivity pneumonitis in Japan.

We saw a patient with granulomatous pneumonitis who exhibited clinical symptoms from summer to mid-autumn for four years (1974 to 1977). Clinical symptoms, chest x-ray film and histopathologic findings suggest that this may be a unique type of hypersensitivity pneumonitis, related to an environmental condition like ventilation pneumonitis.1,3

CASE REPORT

A 50-year-old female barber complained of cough, white mucoid sputum, exertional dyspnea, loss of appetite and general malaise since the end of August, 1974. Although she was considered to have respiratory infections and antibiotics were prescribed, her clinical symptoms did not improve. She visited another hospital where a chest x-ray film was taken (Fig 1). Diffuse nodular shadows, together with linear shadows in the left upper lobe and calcified nodules in the left mid-lung field due to old tuberculosis, were seen. Physical findings revealed bilateral crackles in the posterior lung bases. She was treated with tetracycline, bronchodilators and mucolytic agents which were not effective. The patient developed fever of 38.0°C with increased sputum production and dyspnea. She was transferred to Keio University Hospital for more in-depth evaluation on October, 1974. On physical examination, the patient was a well-nourished woman with normal vital signs. There was no cervical node enlargement, cyanosis or clubbing. Moist, subcrepitant rales were noted in both posterior lung bases. The liver edge was palpable, but no splenomegaly was detected.

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FIGURE 1. Chest film taken on October 7, 1974. Diffuse bilateral scattered nodular shadows and a calcified nodule suggesting old tuberculosis at the left middle area are seen.

Laboratory data on admission to Keio University Hospital showed the following: leukocyte count, 6,300 with normal hemogram; total serum protein, 7.6 g/dl, with 49.1 percent albumin, 50.9 percent globulin and 25.6 percent γ-globulin; immunoglobulin levels: IgG 1,765 mg/dl, IgA 365 mg/dl, IgM 190 mg/dl, IgE 40 IU/ml; PPD skin test was negative. Serum precipitating antibody against Microspora faeni, Thermoactinomyces vulgaris, Thermoactinomyces sacchari, Aspergillus fumigatus, Candida albicans, Alternaria tenuis, pigeon serum and droppings, parakeet serum and a sample of dust from her electric vacuum cleaner was not detected by Ouchterlony gel double immunodiffusion. Sputum culture was negative for Mycobacterium tuberculosis. Vital capacity was 2,160 ml (93 percent of predicted value), FEV₁, 1,900 ml (80 percent); Pao₂.

FIGURE 2. Granulomatous lesions of epithelioid cells and small mononuclear cells without central necrosis seen at the interstitium of the biopsied lung (Hematoxylin eosin stain, original magnification, × 200).
DISCUSSION

A case of granulomatous pneumonitis is reported with repeated clinical episodes over four consecutive summer seasons. The patient lived in a old wooden Japanese house which was attached to a room used as barber shop not equipped with an air conditioning system. Since the discovery of the first case, the authors have had the opportunity to see 12 similar cases whose symptoms gradually appeared from June to September and subsided in the middle of autumn. Some of these patients again developed identical clinical symptoms in four to eight hours upon returning to their own home following hospitalization and clinical improvement. We call this environmental provocation "returning home provocation," however, this case was not subjected to environmental provocation. In two cases, symptoms were observed in a single family (ie, father and daughter).

Clinical symptoms, laboratory data, diffuse scattered nodular shadows on chest x-ray film, and epithelioid granulomas without central necrosis of biopsied lung, clearly suggested that this is a case of hypersensitivity pneumonitis. With reported diseases of hypersensitivity pneumonitides, patients' sera showed precipitating antibodies against offending antigens. With this case, known causative antigens such as thermophilic actinomycetes or avian proteins, and extract of dust from her vacuum cleaner or common microorganisms grown from the dust of her home including Bacillus subtilis, Aspergillus sp, Penicillium sp and a Streptomyces sp, did not show precipitin with the patient's serum using Ouchterlony gel double immunodiffusion. Thus, an offending antigen in this case could not be identified.

The seasonal onset of clinical symptoms, positive natural or biologic provocation test upon returning home, and familial occurrence of cases suggest pollution of the home environment with microorganisms or a home-associated inhalant antigen.

REFERENCES

Bronchoalveolar Lavage and Technetium-99m Glucoheptonate Imaging in Chronic Eosinophilic Pneumonia*

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A patient with chronic eosinophilic pneumonia was evaluated using bronchoalveolar lavage, technetium-99m glucoheptonate, and transbronchial lung biopsy. Bronchoalveolar lavage revealed 43 percent eosinophils and correlated well with results of transbronchial lung biopsy. Technetium-99m glucoheptonate lung imaging demonstrated intense parenchymal uptake. After eight weeks of corticosteroid therapy, the bronchoalveolar lavage eosinophil population and the technetium-99m glucoheptonate uptake had returned to normal. We suggest that bronchoalveolar lavage, with transbronchial lung biopsy, is a less invasive way than open lung biopsy to diagnose chronic eosinophilic pneumonia. The mechanism of uptake of technetium-99m glucoheptonate in this disorder remains to be defined.

Chronic eosinophilic pneumonia (CEP) is a subacute-to-chronic pulmonary disorder that occurs most often in nonatopic women. Symptoms include cough, fever, night sweats and weight loss. The typical chest roentgenographic appearance of bilateral peripheral infiltrates has been referred to as the photographic negative of pulmonary edema. Histologically, this disease is characterized by an interstitial and alveolar infiltrate comprised mainly of eosinophils. Prolonged corticosteroid administration remains the cornerstone of therapy.

We used sequential bronchoalveolar lavage (BAL) to characterize alveolar cell populations before and after eight weeks of corticosteroid treatment in a patient with biopsy-proved chronic eosinophilic pneumonia. In addition, we evaluated pulmonary uptake of technetium 99m-glucoheptonate (Tc-GHA) as part of an ongoing study of this radionuclide in inflammatory diseases of the lung.

Case Report

A 67-year-old man with moderate-to-severe chronic obstructive pulmonary disease presented with a three-week history of severe dyspnea, night sweats and a 5 kg weight loss. He denied fever, cough, or sputum production. Past medical history was negative for travel, asthma, or allergy. The patient had not smoked for 25 years and his medications included terbutaline and an albuterol inhaler.

Physical examination revealed a thin man in moderate respiratory distress, with an oral temperature of 37.8°C. Auscultation of the lungs revealed decreased breath sounds bilaterally, but no rales, rhonchi or wheezing. The remainder of the examination was normal except for trace edema in the lower extremities. The admission chest radiograph showed diffuse bilateral infiltrates (Fig 1). The white blood cell count was 14,500/cu mm with 38 percent eosinophils. The erythrocyte sedimentation rate was 55 mm in the first hour. Serum IgE level was normal. Aspergillus precipitins were negative. BAL and transbronchial lung biopsy were performed using a fiberoptic bronchoscope (Olympus IT1) after completion of Tc-GHA imaging of the chest (Fig 2). The results of BAL are shown in Table 1. Transbronchial lung biopsy showed intraalveolar eosinophils and infiltration of alveolar septae by eosinophils that was characteristic of CEP. There was an excellent correlation between BAL and transbronchial lung biopsy. The patient was started on oral prednisone (60 mg/day) with marked improvement in his symptoms after three days.

He returned to the hospital eight weeks later when repeat chest roentgenogram (Fig 3), BAL (Table 1), and glucoheptonate scan (Fig 4) were obtained.

Technetium-99m Glucoheptonate (Tc-GHA) Imaging

Tc-GHA imaging was completed prior to fiberoptic bronchoscopic examination on both occasions. Chest scintigrams were obtained five to six hours after intravenous injection of 20 mCi Tc-GHA using an Anger scintillation camera (600,000 counts/scintigram). Pulmonary activity equal to liver activity was considered significant.

FIGURE 1. The admission chest roentgenogram shows bilateral peripheral infiltrates, left perihilar haziness, cardiomegaly, and a small right pleural effusion.

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