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## A Case Report of Chronic Eosinophilic Pneumonia in a Child with Manifestations Similar to Miliary TB

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### ABSTRACT

*Eosinophilic pneumonia is a rare disease in children and should be considered in differential diagnosis of bilateral pulmonary infiltration associated with peripheral blood eosiniphilia.*

*In this report, a 13- year-old boy is presented with pulmonary involvement. He had an 8- year history of dry cough with fever and had received anti tuberculosis treatment for four times with diagnosis of smear negative pulmonary tuberculosis, but showed no evidence of clinical and radiological improvement. Bacteriologic evaluation for tuberculosis, tuberculin test, and PCR for *M. tuberculosis* were all negative. Pulmonary function tests of the patients revealed a restrictive pattern. Complete blood count demonstrated eosinophilia several times. The patient underwent bronchoscopy, which showed eosinophilia in bronchial secretions and open lung biopsy was performed, which confirmed the diagnosis of chronic eosinophilic pneumonia. Oral prednisolone was administered for the patient for 4 weeks. His clinical condition improved, and control radiography was indicative of improvement in pulmonary lesions. (Tanaffos 2003; 2(6): 75-79)*

**Key words:** Eosinophil, Pneumonia, Tuberculosis

### INTRODUCTION

The syndrome of "P.I.E." pulmonary infiltration with eosinophilic pneumonia (PIE) was initially divided into four groups in 1952 (1).

In 1960, Christoforidis and Mohar first described this disease (2). Later in 1969, other diseases including chronic and acute eosiniphilic pneumonia, idiopathic easinphilic pneumonia or hyper eosinophilic syndrome, drug induced pulmonary eosinophilia, and ABPA (Allergic Bronchopulmonary Aspergillosis) were introduced. Although Chronic Eosiniphilic Pneumonia (CEP)

occurs mainly in females in the 30-50 age group, it has occasionally been reported in other age groups. Acute eosinophilic pneumonia (AEP) has been reported in infants as well (3). The onset is insidious with symptoms of fever, weight loss, night sweats, cough, and dyspnea resembling infectious diseases. AEP sometimes takes on a fulminant presentation with ARDS and respiratory failure (4). Fifty percent of patients admit history of asthma, and peripheral blood eosinophilia (eosinophil>6%) is the main finding which is accompanied by elevated serum total IgE level in two third of the patients (5).

Radiological findings are specific with the patterns of reticular, alveolar or bilateral nodular

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infiltration with or without hilar or mediastinal adenopathy known as “photographic negative pulmonary edema” or “reversed butterfly pattern” (6).

Diagnosis is confirmed by bronchoscopy and bronchoalveolar lavage (BAL) for determination of eosinophil level in BAL fluid. Open lung biopsy is not required to establish a conclusive diagnosis if it has already been made by bronchoscopy and BAL (7,8).

In this report, a 13-year old boy who had received four courses of anti-tuberculosis treatment since 8 years ago is presented with pulmonary involvement. It is to emphasize by this report that eosinophilic pneumonia should be considered as differential diagnosis of most infectious diseases such as tuberculosis in children and adolescents.

#### **CASE SUMMARIES**

A 13-year-old boy from Gonabad, one of the cities in northeast of Iran, was referred to National Research Institute of Tuberculosis and Lung Disease (NRITLD) with a two week history of dry cough, fever, weight loss and night sweat. He has, four times, received anti-tuberculosis treatment with the diagnosis of smear negative pulmonary T.B since 8 years ago. History of tuberculosis exposure was not detected. The patient is the first child in his family, delivered by normal vaginal delivery with normal Apgar score. Routine vaccination has been done properly. His siblings, one brother and two sisters, showed no evidence of illness. His father had history of asthma. On physical examination, the patient’s general condition was good (W= 34 Kg). Head and neck examination were normal. Chest auscultation revealed bilateral generalized wheezing. In abdominal examination no organomegaly was detected. Examination of extremities was normal. Other organs were normal.

In CBC of the patient, leukocytosis (12000 cell/ml) with eosinophilia (8%-25%) was reported many times.

Erythrocyte sedimentation rate varied from 35 to 65. Tuberculosis skin test was negative. Sputum smear and culture for mycobacterium tuberculosis and fungi were negative. PCR of sputum for M. Tuberculosis was reported negative. Liver and urinary tests showed no abnormality.

Stool exam for ova and parasites was repeatedly negative. ACE level was normal and P-ANCA, C-ANCA and ANA were all negative. Results of arterial blood gas were within normal limits. Pulmonary function test showed restrictive pattern. Flow-cytometric examination of patient’s peripheral blood was normal.

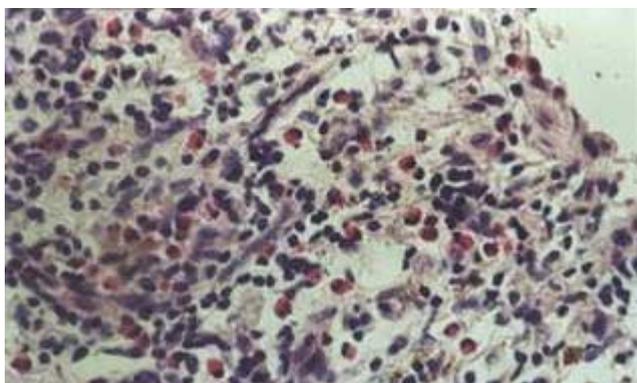
Sinus radiography was normal and chest radiography demonstrated diffuse bilateral zones. (Figure 1)



**Figure 1.** CX ray showed diffuse bilateral zones.

Chest CT scan showed right paratracheal adenopathy in addition to pulmonary alveolar lesions. BAL was performed twice. In the first report, the fluid was reported to be normal, but in the second one, BAL revealed eosinophilia. Open lung biopsy was performed for the confirmation of diagnosis.

Lung pathology was consistent with alveolar and interstitial eosinophilic infiltration (Figure 2).



**Figure 2.** Histopathological examination of patient

With the diagnosis of CEP, the patient received prednisolone, 1.5 mg/kg for four weeks. The prednisolone was tapered within two weeks. Clinical improvement was remarkable two weeks after the onset of the first month of the treatment, and control chest radiography at the end of the first month of treatment showed clearance of pulmonary lesions (Figure 3).



**Figure 3.** CX-ray at the end of the first month of treatment

## DISCUSSION

Clinical manifestations and paraclinic tests suggested a pulmonary infection. Radiologically, the finding of right paratracheal adenopathy associated with symptoms of fever, night sweats, and cough suggest infectious granulomatous disease such as pulmonary tuberculosis, fungal lesions or other conditions such as sarcoidosis (9).

Although performed bacteriological tests including smear and culture of gastric aspirate for AFB, tuberculin test and PCR of sputum for M. TB were all negative, the patient had been treated with anti-tuberculosis drugs, four times.

Further studies were undertaken to exclude some other conditions in differential diagnosis of PIE syndromes such as: Sarcoidosis, Immunodeficiency, Idiopathic Pulmonary Fibrosis (IPE), ABPA and vasculitis, which all were negative (10).

Pulmonary function tests (PFT) can sometimes be of help in diagnosis of this syndrome. Some lung diseases are typically accompanied mainly by restrictive defects including acute eosinophilic pneumonia, chronic eosinophilic pneumonia, interstitial lung disease, and tropical pulmonary eosinophilia (11). In this report, PTE of the patient showed a restrictive pattern.

The only significant radiologic finding in our patient was bilateral alveolar infiltrates being more prominent in the peripheral zones. Computed tomographic (CT) scanning confirmed diffuse parenchymal involvement of both the lungs along with right paratracheal adenopathy. This diffuse pattern accompanied by the past history of administration of anti-tuberculosis therapy (4 times) suggested diffuse or miliary tuberculosis.

When final diagnosis by pathology was made, treatment with prednisolone, (at a dose of 1.5ml/kg) was initiated. Control chest radiography one month after therapy, showed evidence of improvement of observed lesions, which was a sign of the

effectiveness of the treatment. Duration of therapy with corticosteroids is two weeks. It is recommended that the dose should be tapered in 4-6 weeks. However, some suggest that treatment course be extended to six months in order to prevent relapse. The relapse usually occurs in the previously involved site. CEP is difficult to diagnose because its presentation resembles infectious diseases especially granulomatous ones. Also, peripheral eosinophilia is observed in parasitic infections. In such circumstances, precise diagnostic procedure should be performed to exclude other conditions. CEP is among differential diagnosis of lung infiltration associated with eosinophilia. BAL can be of great value in ruling out infection and confirmation of diagnosis.

In case of peripheral blood eosinophilia and eosinophilia in BAL associated with pulmonary infiltrates, diagnosis of eosinophilic pneumonia should be considered.

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