THE PIE SYNDROME

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This brief resume of the syndrome of pulmonary eosinophilia is an attempt to draw the attention of fellow physicians to the local relevance of the problem in terms of its association with refractory asthma, the apparent under diagnosis of aspergillosis and other fungal infections in the community and the possibility of tropical eosinophilia specifically in the trickling mass of Bangla Deshi emigrants settled in certain areas of Karachi. The possibility of eosinophilic features on the Chest X-Ray must also be kept in mind as an important differential diagnosis to Pulmonary Tuberculosis and vice versa.

Key Words: - Pulmonary Eosinophilia
-Aspergillosis


The combination of a significant peripheral blood eosinophilia and the radiographic evidence of a patchy consolidatory process in the lung parenchyma suggests the possibility of Pulmonary Infiltrate with Eosinophilia Syndrome. This includes a number of conditions that have these two features common to them. In our local practice, it is very often noticed that a diagnosis of Pulmonary Tuberculosis is made on a single such chest radiograph notwithstanding a serial of chest x-rays that reveal fleeting infiltrates regardless of anti-tuberculous therapy. Even historically, Loeffer in 1932 had initially considered tuberculosis in the patients he later described as having hypersensitivity reaction to infestation with Ascarisis and which came to be known as the Loeffer's Syndrome.

The term 'pulmonary eosinophilia' was originally coined by Crofton for a group of disorders characterised by pulmonary infiltrates casting shadows on the CXR and accompanied by a peripheral eosinophilia. He excluded conditions like Hydatid disease, Hodgkin's lymphoma and Sarcoïdosis which may have an accompanying high eosinophil count. Pulmonary infiltrates with eosinophilia covers a large group of diseases ranging from brief illnesses which may be asymptomatic and unrecognised, to fulminating diseases like Polyarteritis nodosa and Wageners granulomatosis which progress relentlessly and Wageners granulomatosis which progress relentlessly and culminates in death. Crofton maintained that an underlying hypersensitivity reaction was responsible for most cases of pulmonary eosinophilia, justifying the consideration of these together in one group.

Crofton's classification includes (1) Loeffler's syndrome, (2) Tropical eosinophilia, (3) Asthmatic pulmonary eosinophilia, (4) Chronic eosinophilic pneumonia and (5) Pulmonary vasculitis.

Cough, dyspnea, an abnormal pulmonary shadow and a high peripheral eosinophilic count is common to all forms of pulmonary eosinophilia. The respiratory symptoms may be variable such as they may be minimal in Loeffler's Syndrome while at times very severe constitutional symptoms. Though these may generally be confined to the lung but the exceptions are associated with the pulmonary vasculitis and the eosinophilia - myalgia syndrome.
The radiological shadowing varies markedly and may be localized or diffuse, segmental or non-segmental. Wide variations may occur between patient to patient. Transient and fleeting infiltrations are more common with Loeffler’s and tropical eosinophilia while peribronchial cuffing may be noted at times. In the asthmatic pulmonary eosinophilia associate with a lot of mucous plugs and in cases of bronchopulmonary aspergillosis recurrent infiltrates at more or less the same locale may be seen again and again but sometimes radiological signs of sub-segmental or segmental atelactasis are also seen. Cavitary and cystic changes depicting bronchiectasis may appear at a later stage.

The pulmonary function tests often show a picture of combined limitations. The obstructive component is more obvious and overwhelming and shows some reversibility to bronchodilator aerosol trials but a restrictive limitation is also perceivable and suggests a more chronic and severe dysfunction.

The salient features characterising the different conditions classified by Crofton are summarized in the following paragraphs.

TRANSIENT PIE (Loeffler’s) SYNDROME.
Relatively mild illness, cough of varying degree; mostly dry. Malaise, mild short fever. Peripheral eosinophilia less than 20%. CXR: Fleeting fan shaped shadows mostly upper and middle lobe near the helixum, sometimes nodular. Often bilateral upper lobes. Transient, cleared in 2-3 weeks. Basically, a transient allergic alveolitis. Allergens implicated include helminths like Ascaris, Ankylostoma and Trichuris as well as drugs such as PAS, Aspirin, Penicillin’s, nitrofurantoin and sulphonamides. Over the years numerous drugs have been implicated in the PIE Syndrome, cyto-toxic agents, antibiotics and NSAIDs are more common and important among them.

The management requires identification of the incriminating agent and its removal by either eliminating the helminth by deworming or by removing the drug that may have caused the hypersensitivity. A short dose of steroids may or may not be required depending on the symptoms.

PROLONGED PIE.
‘Prolonged Eosinophilia’, ‘Prolonged Loefflers’ have been terms applied to the same condition due to the same allergens perhaps with the addition of Strongyloides but the disease continues for a much longer time and with an eosinophilia of more than 20%.

TROPICAL PULMONARY EOSINOPHILIA.
A condition particularly related to the South Asian subcontinent and Wucheria bancrofti (Filariasis). Although the majority is so related by an allergic response to microfilaria but other parasitic infestations including Ascaris, Ankylostoma and Strongyloides can cause it. These can be differentiated by a positive clearing with Diethylcarbamazine in Filariasis and Ascariasis as against no response in others. A strongly positive filarial complement fixation test distinguishes between the two. Unfortunately, this complement fixation test remained available for a short while in the AKUH but is not available in Karachi, any more. There is often a very high blood eosinophilia of more than 20% and sometimes as high as 40-80%. Also a high IgE level is often seen even in prolonged disease. Symptomatically there may be nocturnal spells of sever cough with scant expectoration and lassitude. The CXR may show increased vascular markings to diffuse nodularity. The PFT shows a mixed restrictive-obstructive limitation with a markedly reduced FEV1%. Treatment with Diethylcarbamazine 5-10mg / Kgbw for 7 days results in clearing between 1-3 weeks.
ASTHMATIC PULMONARY EOSINOPHILIA

The increased production, localization, and degranulation or the eosinophils in respiratory tissue is an important element in airway inflammation and hyperactivity in Asthma. Thus a mild rise in peripheral blood film is not unusual in many asthmatics. However, where Asthma with a refractory bronchospasm and moderate to high eosinophilia is accompanied by pulmonary infiltrates, the diagnosis of allergic broncho-pulmonary aspergillosis should be considered. A high IgE level, pertinent skin testing and a CT finding of focal Bronchiectasis will go along to prove the diagnosis. Corticosteroids are the treatment of choice and should be given in a dose and duration to reverse the inflammatory process.

CHRONIC EOSINOPHILIC PNEUMONIA.

Progressive pulmonary disease with CXR showing massive infiltration limited more to the periphery and upper lobes in what has been termed as a ‘reverse pulmonary edema’. Features of asthma and a very high eosinophilic count of upto 89% may be seen. Constitutional symptoms of fever often high grade, weight loss, and progressive dyspnea. Therapy is directed towards correcting airway obstruction and hypoxemia and corticosteroids prednisolone at 1 mg/kgbw/day results in very good response clinically, physiologically and on the CXR.

ALLERGIC PULMONARY VASCULITIS
(CHURG - STRAUSS SYNDROME).

A history of asthma and rhinitis, and complaints of fever, malaise, weight loss and dyspnea. Other organ involvement’s may overwhelm the respiratory feature involving many organs of the body causing skin rashes, mononeuritis, arthralgias, urinary obstruction or hematuria. CXR findings may vary from bilateral nodularity to diffuse interstitial disease. The diagnosis is confirmed by finding an eosinophilic granulomatous vasculitis in the involved tissue. The disease responds well to oral corticosteroids.