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Opinion Article

Eosinophilia and Lymphocytic Hypereosinophilic Syndromes of Idiopathic Illnesses

Wendy Menzies*

Department of Life Sciences, Manchester Metropolitan University, Manchester, UK

DESCRIPTION

Eosinophilia is a condition in which the quantity of eosinophils in the tissues and/or blood increases. Blood eosinophil counts are more easily and routinely measured than tissue eosinophil counts, which require inspection of biopsied samples. As a result, an increase in eosinophils in the blood is frequently used to diagnose eosinophilia. Absolute eosinophil levels of 450 to 550 cells/L are considered elevated, depending on laboratory standards. Most institutions consider percentages of the differential exceeding 5% to be high, albeit the absolute count should be measured before a diagnosis of eosinophilia is made. This is calculated by multiplying the total white cell count by the eosinophil percentage.

Antigen presentation, the release of lipid-derived, peptide, and cytokine mediators for acute and chronic inflammation, responses to helminth and parasite elimination by degranulation, and continuous homeostatic immune responses are just a few of their functions.

Allergic sensitization

Mild eosinophilia is common in allergic illness patients (we'll use 1500 cells/L to define mild, but hypereosinophilic syndromes, which are discussed elsewhere in the article, are commonly classified as sustained eosinophilia >1500 cells/L). Mild eosinophilia is common in allergic rhinitis and asthma. If atopic dermatitis affects a broad area of the body and is linked with considerable atopy, the eosinophilia may be more severe. Mild peripheral eosinophilia can be caused by eosinophilic esophagitis and other eosinophilic gastrointestinal disorders.

Allergic bronchopulmonary aspergillosis, which is caused by a fungus (Aspergillus) and sensitization in an allergic/asthmatic host, can cause eosinophilia and raised total immunoglobulin (Ig)E levels in varying degrees. In addition to liver function abnormalities, temperature dysregulation, and lymphadenopathy, the Drug Rash with Eosinophilia and Sstemic Symptoms (DRESS) syndrome frequently causes considerable eosinophil increases. Antibiotics, antiepileptics, antigout regimens, antiretrovirals, and nonsteroidal anti-inflammatory medications were found to be the most common causes of the DRESS syndrome in evaluations of two large, hospital-based cohorts of monitored drug allergies in Brazil and Malaysia. Stevens-Johnson syndrome and toxic epidermal necrolysis, two severe and life-threatening forms of drug allergy, frequently result in neutrophilia and lymphocytopenia rather than eosinophilia.

Parasite- and infection-related eosinophilia

Strongyloides, trichinella, ascaris, hookworm, and visceral larva migrans (*Toxocara* from dogs/cats) are all parasites that can be contracted without travelling to another country. Strongyloides testing is required when screening a patient for a suspected helminthic aetiology of eosinophilia since it is unique among helminths in that it can remain even decades after infection. *Strongyloides* can produce a variety of symptoms, including hives, dermatographism, angioedema, and stomach pain. Disseminated strongyloidiasis can develop if a patient with an undetected Strongyloides infection is given high-dose systemic corticosteroids. This is sometimes linked to intestinal bacterial sepsis and is potentially deadly.

Eosinophilia has also been linked to fungi like coccidioidomycosis (acute and chronic), disseminated histoplasmosis (less typically eosinophilic), and cryptococcosis (particularly with central nervous system infections). *Coccidioides* can be found in the Southwestern United States, Mexico, Central and South America, and the Caribbean. Because *Histoplasma* can be found in the droppings of birds and bats, cave exploration and residing in locations with high pigeon populations can result in large exposures. *Cryptococcus* can be found in soil all around the world. In immune compromised hosts, these infections are often more severe and widespread.

Correspondence to: Wendy Menzies, Department of Life Sciences, Manchester Metropolitan University, Manchester, UK, E-mail: menzieswendy@swansea.ac.uk

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Autoimmune disease

EGPA, formerly known as Churg-Strauss syndrome, develops in atopic individuals and causes variable degrees of sinus disease, lung illness, kidney disease, and mononeuritis multiplex, as well as vascular disease. In affected locations, EGPA is linked to substantial eosinophilia, elevated inflammatory markers, and tissue eosinophilia. It has hypereosinophilic syndromes in its differential diagnosis and shares many characteristics with them (discussed elsewhere in this article). Vasculitis is frequently discovered late in the course of the disease, particularly if the kidneys are not implicated. Antineutrophil cytoplasmic antibody positivity (per nuclear antineutrophil cytoplasmic antibody) is significantly lower in EGPA with eosinophilia and predominantly nonhemorrhagic lung manifestations than in EGPA with renal involvement, so antineutrophil cytoplasmic antibody tests do not rule out EGPA disease.

Primary eosinophilia

Idiopathic, myeloproliferative, and lymphocytic hypereosinophilic syndromes are a group of illnesses in which eosinophilia is always present and can range from mild to severe. The underlying cause can be etiologically defined or entirely idiopathic. Lungs, skin, heart, blood vessels, sinuses, kidneys, and brain are among the organs that can be affected. Idiopathic illness might manifest itself asymptomatically or with persistent fatigue, myalgias, weakness, and overall malaise. Except for the eosinophilia, which can be resistant to even corticosteroid treatment, the workup can be unrevealing.

Episodic angioedema with eosinophilia (Gleich syndrome) is characterized by eosinophilia, angioedema, urticaria, pruritus, fever, weight gain, and, in certain cases, a raised IgM level. These individuals' symptoms are caused by an underlying immunological dyscrasia, with an increase in eosinophils and antecedent rises in the cytokine interleukin-5.