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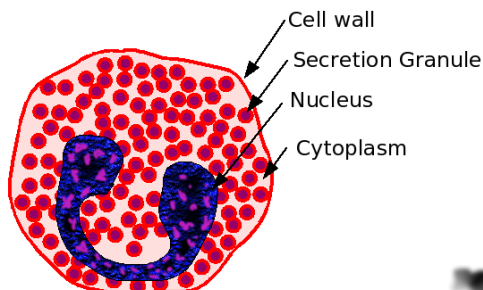
## Introduction

A broad variety of allergic, infectious, neoplastic and idiopathic diseases are associated with increased blood Eosinophils.

Peripheral eosinophilia can be divided into categories of:-

### A. Primary eosinophilia (clonal expansion of eosinophils)

- Hypereosinophilia Syndrome
- Leukemia
  - Acute Leukaemia
  - Chronic Myeloid Leukaemia
  - Other Myeloproliferative disorders & MDS



Eosinophil

### B. Secondary eosinophilia

Infectious causes

- Parasitic infectious mostly Helminths
- Specific fungal infections; Other infections (infrequent)

### Non infectious causes

- Allergic conditions
- Medication related eosinophilia

- Toxins
- Autoimmune diseases
- Endocrine disorders
- Lymphoma Hodgkin's, Non Hodgkin's
- Metastatic cancers
- Pulmonary diseases
- Gastrointestinal diseases
- Neurologic diseases
  - Asthma



### A. Primary eosinophilia

Conditions with evidence of clonal expansion of eosinophils

- Hypereosinophilic Syndrome

Diagnosis:

- Required persistent eosinophilia  $>1.5 \times 10^9 / L$  in blood, for at least 6 weeks increased numbers of bone marrow eosinophils and  $<20\%$  Myeloblasts in the bone marrow.
- Exclude all causes of reactive eosinophilia; neoplastic disorders with secondary eosinophilia and other neoplastic disorders in which eosinophilia are part of the neoplastic clone e.g. Leukemia; CML; MDS.
- Involvement of multiple organs such as the heart gastrointestinal tract, lungs,

brain and kidneys develops in time.

### Leukemia Acute leukemia

Acute eosinophilic leukemia is a variant of FAB M4 phenotype of AML and has the characteristic of chromosomal 16 abnormalities (Inv (16) and t (16; 16) The other leukemias associated with eosinophilia are Precursor BCell lymphoblastic leukemia with t (5; 14) and Precursor T-Cell lymphoblastic lymphoma with t (8; 13)

Diagnosis:

1. FBC
2. Bone marrow aspirate and biopsy.
3. Flow cytometry and cytogenetics on bone marrow

### Myelodysplastic

Diagnosis:

- a) Bone marrow aspirate and biopsy and cytogenetics.

Chronic Myeloid Leukemia

Diagnosis:

- a) PCR for the BCR/ ALB Fusion gene done on peripheral blood.

## B. Secondary (Reactive) eosinophilia

- Infectious disease With the exception of scarlet fever, acute bacterial or Viral infections characteristically produce eosinopenia
- Parasitic infections: - Mostly helminthic parasites elicit eosinophilia during the acute infection via stimulation of Th2 like lymphocytes. The TH2 response is characterized by the production of interleukin IL4 and IL5, subsequently generating IgG and IgE secreting cells and eliciting eosinophilia.

Diagnosis:

- e) Proper history as well as travel history
- f) Clinical findings
- g) Stool examination if helminthic infection are being Considered. Multiple stools required. (At least 3)
- h) Serology is useful in detecting Schistosoma, Toxocara canis, (Send away to NHLS).
- i) Sputum analysis can be ordered for suspected pulmonary infection with Strongyloides or Paragonimus.
- j) Wuchereria Bancroft blood smear on peripheral blood.
- k) IgE levels in intestinal worms / helminths.

The optimal management of the asymptomatic traveler or immigrant with eosinophilia is still debated. Studies indicate that up to 50% of patients never have a cause but others suggested a strategy of using empiric anthelmintic therapies on the basis of cost-effectiveness. Suggest Albendazole or Mebendazole.

• Fungal Infections

Blood eosinophilia is found in most patients with allergic bronchopulmonary aspergillosis and in approximately 25% of patients with primary coccidioidomycosis.

Diagnosis:

- Fungal cultures on blood.
  - HIV and other retroviral infections
- Occasionally marked to moderate eosinophilia observed. Usually secondary to reactions to medications, adrenal insufficiency (2 to CMV), eosinophilia folliculitis and as part of the hyperimmunoglobulin E syndrome

or exfoliative dermatitis.

- Allergic Disorders
- Allergic Rhinitis  
Diagnosis:

- a) Do a gram stain on nasal discharge. Nasal eosinophilia is absent in viral infections.
- b) Normal IgE levels
- c) Responsive to topical steroids
- d) It can be associated with nasal polyposis asthma

- Allergic Asthma
- Diagnosis:

- Sputum eosinophilia with blood eosinophilia is characteristic of allergic asthma.
- In non allergic asthma, eosinophilia is not observed in blood but sputum eosinophilya can be found.

- Medication
- Diagnosis:

- a) Many conventional or alternative medications may produce Eosinophilia.
- b) A detailed history is important.
- Auto immune diseases
  - Churg Strauss Syndrome
  - Wegener's Granulomatosis
  - Polyarthritis nodosa

- Diagnosis:

-Suggest ANF, ANCA, CRP, Rheumatoid factor and full blood count with ESR.

- Neoplastic disorders

Diagnosis:

- a) Systematic Mastocytosis is characterized by proliferation and accumulation of mast cells in various

organs including skin, liver, spleen, bone marrow and lymph nodes. Patient present with symptoms resulting from organomegaly, hematologic or cutaneous abnormalities.

- b) Diagnosis made on a tissue and or lymphnode biopsy as well as a bone marrow aspirate and biopsy.

- Other malignancies

- a) Sezary Syndrome
- b) Cervical tumors
- c) Large undifferentiated lung CA.
- d) Squamous carcinoma of the vagina, skin, penis and nasopharynx.
- e) Adenocarcinomas of the stomach, large bowl and uterine body.
- f) Transitional bladder carcinoma.

- Endocrine

- a) Adrenal insufficiency. The loss of endogenous glucocorticoids in any cause of adrenal insufficiency results in blood eosinophilia.

- Pulmonary disease

- a) Hypersensitivity pneumonitis
- b) Loeffler's pulmonary infiltrates of eosinophils, endomyocardial fibrosis and eosinophilic myocarditis.

- Reference:

- UpToDate Version 16.3
- Postgraduate Haematology Fifth Edition

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