Eosinophilia

The main functions of eosinophils include involvement in defence against parasites, allergic responses, tissue inflammation and immunity. Eosinophilia is a peripheral eosinophil count greater than the upper limit of normal range, usually around 0.45 x 10^9/L. In many cases the cause is clear - eg, atopic disease. However, the differential diagnosis includes many serious diseases, including malignancy.

Epidemiology

- In the UK, eosinophilia is most often due to allergic conditions.
- Worldwide, helminth infections are the most common cause of eosinophilia.^[1]

Presentation

- Travel history to assess whether a patient has travelled to an area that is endemic for certain infections, including helminthic infections.
- Medication and diet history to evaluate for allergic reactions associated with eosinophilia.
- History of symptoms associated with possible underlying causes (see 'Causes', below).
- A complete physical examination is required because diseases associated with eosinophilia can involve any part of the body.

Causes

- **Allergy diseases:** asthma, urticaria, eczema, allergic rhinitis, angioneurotic oedema.
- **Drug hypersensitivity.** Drugs which more commonly cause eosinophilia include anticonvulsants, allopurinol, sulfonamides and certain antibiotics.^[2] When eosinophilia is accompanied by a rash and systemic symptoms, this is called the DRESS syndrome (Drug Reaction with Eosinophilia and Systemic Symptoms).^[1]
- **Connective tissue diseases:**
  - Churg-Strauss syndrome. Vasculitis causing multisystem disease, but particularly of the lungs. It is associated with asthma, lung infiltrates and eosinophilia.^[3]
  - Rheumatoid arthritis.
  - Eosinophilic fasciitis. A rare condition characterised by eosinophilia with inflammation and thickening of the skin and fascia.^[4]
  - Polymyositis nodosa.
  - Eosinophilia myalgia syndrome. A rare condition associated with myalgia and eosinophilia.
- **Infections:** in particular, parasitic infections including ascariasis, schistosomiasis, trichinellosis, visceral larva migrans, strongyloidiasis, echinococcosis, coccidioidomycosis.
- **Hypereosinophilic syndromes (HES).** A group of disorders causing high-grade persistant eosinophilia, where other causes have been excluded.^[1]
- **Neoplasia:**
  - Leukaemia: chronic myeloid leukaemia, adult T-cell leukaemia/lymphoma (ATLL), eosinophilic leukaemia (very rare).
  - Gastric cancer or lung cancer (ie paraneoplastic eosinophilia).
- **Endocrine:** adrenal insufficiency - eg, Addison's disease.
- **Skin disease:** pemphigus, dermatitis herpetiformis, erythema multiforme.
- **Löffler’s syndrome** (accumulation of eosinophils in the lungs, due to parasitic infection).
- **Löffler's endocarditis** (restrictive cardiomyopathy with eosinophilia).
- **Irradiation.**
- **Post-splenectomy.**
- **Cholesterol emboli.**

Investigations

Investigation is guided by the history, examination, and clinical picture and may include:

- FBC, including differential white cell count.
- Renal function tests, LFTs.
- Urine tests: all patients with blood eosinophilia and haematuria and who have been in Africa should have their urine examined for the eggs of _Schistosoma haematobium_. Cystoscopy may be required to confirm the diagnosis.
- Lumbar puncture: CSF eosinophilia due to worm infections (eg, _Angiostrongylus cantonensis_), drug reactions, and coccidioidomycosis meningitis.
CT scans of the lungs, abdomen, pelvis, and brain evaluate for focal defects due to diverse causes of eosinophilia - eg:

- Worm infections of the liver (eg, *Fasciola hepatica*) can cause focal hepatic lesions.
- Coccidioidomycosis can cause focal lesions in the lung, which are visible on CXR or CT scan.
- Hodgkin's lymphoma or non-Hodgkin's lymphoma can cause lymphadenopathy in the abdomen, which can be seen on a CT scan.

- Echocardiogram to assess for thrombi (eg, mural, endocardial) due to hypereosinophilic syndrome.
- Bone marrow biopsy may be required.

### Further reading & references

- Guideline for the investigation and management of eosinophilia; British Committee for Standards in Haematology (2016)

4. Eosinophilic fasciitis; DermNet NZ

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