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Opinion Article

Eosinophilia: A Detailed Review of Causes, Diagnosis and Treatment Approaches

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DESCRIPTION

Eosinophilia is a condition characterized by an elevated number of eosinophils, a type of white blood cell, in the blood or tissues. Eosinophils lead a significant role in the body's immune response, particularly in combating parasitic infections and participating in allergic reactions. Understanding eosinophilia involves exploring its various causes, diagnostic approaches and treatment options.

Causes of eosinophilia

Eosinophilia can result from a wide range of conditions, which can be broadly categorized into primary, secondary and idiopathic causes.

Hematologic disorders: These include myeloproliferative disorders such as chronic eosinophilic leukemia and Hypereosinophilic Syndrome (HES). In these conditions, there is an abnormal proliferation of eosinophils in the bone marrow.

Infections: Parasitic infections are a common cause of eosinophilia, especially in tropical and subtropical regions. Helminth infections, such as those caused by *Ascaris lumbricoides*, *Strongyloides stercoralis* and *Schistosoma* species, frequently lead to elevated eosinophil counts. Additionally, certain bacterial, fungal and viral infections can also induce eosinophilia.

Allergic diseases: Allergic conditions, such as asthma, allergic rhinitis and atopic dermatitis, often result in increased eosinophil levels. Eosinophils are actively involved in the inflammatory response associated with these conditions.

Idiopathic causes

In some cases, the cause of eosinophilia remains unknown despite thorough investigation. Idiopathic Hypereosinophilic Syndrome (IHES) is diagnosed when no underlying cause is identified, but eosinophil levels are persistently high and cause organ damage.

Diagnosis of eosinophilia

The diagnostic approach to eosinophilia involves a comprehensive evaluation to determine the underlying cause. Essential steps in the diagnostic process include:

A thorough history helps identify the significant causes, such as recent travel to endemic areas for parasitic infections, exposure to allergens, use of medications and family history of autoimmune diseases or malignancies.

A complete physical examination can provide clues to the underlying cause, such as signs of allergic conditions (e.g., eczema, nasal polyps), lymphadenopathy, or organomegaly.

Complete Blood Count (CBC): The CBC with differential is essential for confirming eosinophilia and assessing the extent of eosinophil elevation.

Eosinophil count: An absolute eosinophil count above 500 cells is considered eosinophilia, while counts above 1,500 cells are classified as hypereosinophilia.

Serologic tests: Tests for specific infections (e.g., stool ova and parasite examination, serology for parasitic infections) and autoimmune markers (e.g., antinuclear antibodies) are often performed.

Bone marrow aspiration and biopsy: These procedures may be necessary if a hematologic malignancy is suspected.

Treatment of eosinophilia

The treatment of eosinophilia depends on the underlying cause and the severity of the condition. Essential treatment strategies include:

Infections: Antiparasitic or antimicrobial therapy is indicated for infections causing eosinophilia.

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Allergic diseases: Management includes avoiding known allergens and using medications such as antihistamines, corticosteroids and leukotriene inhibitors.

Autoimmune diseases: Immunosuppressive therapy, including corticosteroids and other immunomodulatory agents, is often required.

Drug reactions: Discontinuation of the offending drug is essential, along with supportive care.

Specific treatments for hypereosinophilic syndromes

For primary or idiopathic hypereosinophilic syndromes, corticosteroids are the mainstay of treatment. In refractory cases, other agents like hydroxyurea, interferon-alpha and tyrosine kinase inhibitors (e.g., imatinib) may be used.

In cases of organ damage or severe symptoms, additional supportive measures may be necessary, such as oxygen therapy for respiratory involvement or dialysis for renal impairment.

CONCLUSION

Eosinophilia is a complex condition with a diverse range of causes, requiring a systematic approach to diagnosis and treatment. Early identification and management of the underlying cause are significant for preventing complications and improving patient outcomes. As our understanding of eosinophilia continues to evolve, ongoing research will lead to more targeted and effective therapies for this condition.