

Eosinophils

Interpretive Summary

Description: Eosinophils are white blood cells that are specialized to combat parasites and other infectious diseases. They are also involved in allergic responses.

Decreased Eosinophils

Common Causes

- Normal (some reference intervals include zero)
- Corticosteroid-induced
 - Cushing's disease
 - Exogenous glucocorticoids

Uncommon Causes

- Epinephrine-induced
- Decreased bone marrow production
- Peripheral destruction by immune or other mechanisms

Related Findings

- Corticosteroid-induced
 - Neutrophilia, lymphopenia, monocytosis, eosinopenia, possible thrombocytosis
 - Increased ALP, possible mild increases in GGT, ALT, cholesterol, and glucose
 - Supportive endocrine testing (abnormal urine cortisol: creatinine ratio, ACTH stimulation test, and/or low dose dexamethasone suppression tests)

Increased Eosinophils

Common Causes

- Parasitic infections: ectoparasites and endoparasites
- Allergic/Hypersensitivity responses
 - Asthma
 - Eosinophilic granuloma complex
 - Allergic dermatitis/atopy
 - Food allergies
 - Eosinophilic gastroenteritis
 - Allergic rhinitis/sinusitis

Uncommon Causes

- Infectious: viral, bacterial, fungal, protozoal
- Neoplasia
 - Mast cell neoplasia
 - Lymphoma
 - Carcinoma
 - Thymoma
 - Eosinophilic leukemia

- Endocrine
 - Addison's disease
 - Hyperthyroidism
- Idiopathic conditions
 - Masticatory or extraocular muscle myositis (dogs)
 - Panosteitis (dogs)
 - Eosinophilic bronchopneumopathy (dogs)

Related Findings

- Parasitic infections
 - Positive skin scrapings for ectoparasites
 - Positive fecal tests (fecal ova & parasites, Baermann test, or fecal sedimentation) for parasite eggs or larvae
 - Positive heartworm testing (serology for antigen or antibody, microfilaria testing)
- Hypersensitivity responses
 - Asthma
 - Bronchial pattern on thoracic radiographs
 - Eosinophilic and neutrophilic inflammation found on transtracheal or endotracheal wash
 - Eosinophilic granuloma complex
 - Histopathology supportive of eosinophilic granuloma complex
 - Allergic dermatitis/atopy
 - Abnormalities on skin allergy testing
 - Histopathology supportive of allergic dermatitis
 - Food allergies/eosinophilic gastroenteritis
 - Gastrointestinal biopsies showing eosinophilic inflammation
 - Gastric and/or intestinal wall thickening found on abdominal ultrasound
 - Abnormal serum folate and cobalamin
 - Allergic rhinitis/sinusitis
 - Lymphoplasmacytic or eosinophilic inflammation on nasal biopsies

Additional Information

Physiology

- Eosinophil granules stain variably eosinophilic (pink) depending on the species, and their shape is species specific.
 - The granules are large, round, and uniform in the horse, and rod-shaped and less bright in the cat.
 - Dogs can have varying numbers and sizes of granules.
 - The granules contain lysozymes and other substances that are important to their protective function.
- Eosinophils are active in killing of helminths and also in the regulation of mast cells.
- Eosinophils are most commonly found in the skin, lung, gastrointestinal tract and endometrium

Diagnostic Methodology

- The absolute eosinophil count is calculated by multiplying eosinophil percentage (relative eosinophil count) by the total white blood cell count.

References

- Latimer KS, Mahaffey EA, Prasse KW, eds. *Duncan and Prasse's Veterinary Laboratory Medicine: Clinical Pathology*, 4th ed. Ames, IA: Blackwell; 2003.
- Stockham SL, Scott MA. *Fundamentals of Veterinary Clinical Pathology*, 2nd ed. Ames, IA: Blackwell; 2008.

Last updated 11/1/2013