

Immune-Mediated Hemolytic Anemia

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BASIC INFORMATION

Description

Anemia is an abnormally low red blood cell (RBC) count. The RBC's primary function is to transport oxygen to tissues; when oxygen transport decreases to critical levels, clinical signs occur. Immune-mediated hemolytic anemia (IMHA) occurs when the RBCs are destroyed by the body's own immune system. Certain breeds of dogs are predisposed to IMHA, including the cocker spaniel, poodles, West Highland white terrier, Old English sheepdog, schnauzer, and Irish setter. In cats, IMHA is often associated with certain infections.

Causes

With *primary IMHA*, excessive RBC destruction is immune mediated. The targeted RBCs are coated with antibody; the immune system incorrectly recognizes these cells as foreign and destroys them (hemolysis). *Secondary hemolytic* anemia can be caused by toxins, infections, blood parasites, cancer, drug reactions, and inherited RBC membrane defects. In dogs, 60-75% of IMHA cases are primary and not related to an underlying cause. In cats, secondary hemolytic anemia is more common and is often associated with feline leukemia virus or *Hemobartonella* infection.

Clinical Signs

Clinical signs depend on the severity and the underlying cause of the anemia. Anemia typically causes weakness, lethargy, increased heart rate, poor appetite, and pale gums. Other signs may include fever, jaundice (elevated bilirubin), an enlarged spleen, pica (eating abnormal objects such as dirt), a heart murmur, enlarged glands (lymph nodes), vomiting, diarrhea, weight loss, or depression. Death can occur rapidly if the hemolysis is severe.

Diagnostic Tests

Anemia is diagnosed by measurement of the RBC count or packed cell volume (PCV). When anemia is diagnosed, other laboratory tests may be recommended to further determine whether it is immune-mediated and whether new RBCs are being produced. Additional testing is often needed to evaluate the function of other organs, measure bilirubin levels, detect internal parasites, and search for underlying causes. X-rays may be recommended to search for tumors and damage from trauma and to evaluate various organs.

TREATMENT AND FOLLOW-UP

Treatment Options

If the anemia is severe and life-threatening, hospitalization with repeated blood transfusions (see handouts on **Transfusion Therapy in Dogs** and **Transfusion Therapy in Cats**), oxygen therapy, and intensive supportive care may be recommended to stabilize the patient

while the cause of anemia is investigated. Treatment is then directed at the underlying cause and may include immune-suppressive drugs, antibiotics, parasite control, chemotherapy, or other measures.

For primary IMHA, the main treatment is immune suppression. Treatment is often required for months, with drug doses slowly tapered over time. High doses of steroids (prednisone, dexamethasone) are commonly given initially. Steroids can be combined with other medications (such as azathioprine or cyclosporine) to achieve a more rapid and complete immune suppression, and such combinations are often considered for more serious forms of the disease.

Once immune-suppressive drugs are started, improvement in RBC survival often occurs in 1-7 days, if the patient is going to respond to the medications. Patients with jaundice may be started on very aggressive therapy, because they often do not respond to steroids alone. In some resistant cases, splenectomy may be recommended to slow RBC destruction.

The formation of clots in blood vessels (thromboembolic disease) is a major complication of IMHA, causing death in 30-80% of cases in dogs. These clots can occur throughout the body, with life-threatening consequences. Heparin or low-dose aspirin therapy may be started to minimize clot formation.

Follow-up Care

Responsive cases may be hospitalized for 4-7 days, and longer hospital stays are often needed for severe cases. Steroids have many side effects, including excessive thirst and urination, panting, secondary urinary tract infections, liver enzyme alterations, and skin and hair coat changes. These effects slowly resolve as the steroids are tapered. When steroids are combined with other immune-suppressive medications, the steroids can be used at lower doses and tapered sooner.

Immune-mediated anemias require several months of therapy and monitoring of RBC counts as the medications are tapered. If medications are withdrawn too quickly, hemolysis may recur. Other laboratory tests are often used to monitor for side effects of the medications.

Prognosis

For patients that respond quickly to immunosuppression and do not need repeated transfusions, prognosis is good. IMHA can be a very dangerous disease, however, especially in patients with jaundice and thromboembolic disease. Animals that require repeated transfusions or quickly destroy transfused RBCs have a much poorer prognosis. Mortality rates of 20-80% have been reported with hemolytic anemia. Mortality rates dramatically increase if thromboembolic disease is present. Relapse rates (typically around 15%) in dogs are minimized with long-term use of steroids and azathioprine.