

What is immune-mediated disease?

Immune-mediated **hemolytic anemia** (IMHA) refers to destruction of red blood cells by the body's own immune system. The onset may be related to infection, vaccination, drug administration or cancer; however, in the vast majority of pets no underlying cause is ever identified.

Immune-mediated **thrombocytopenia** (IMT) refers to destruction of the body's blood cells called platelets. In most pets no underlying cause is ever determined.

Of the three cell types in the blood (red cells, white cells and platelets), red cells and platelets are the most frequent targets of immune-mediated attack. IMHA and IMT may occur together. The immune system is generally in tune with the rest of the body, allowing the existence of all normal cells and fighting off only foreign invaders, such as bacteria or viruses. With IMHA and IMT the immune system turns against normal body constituents and causes their destruction. It is unknown why the immune system turns against itself.

A few commonalities exist in regards to possible increased incidences of immune-mediated disease:

- **Genetic factors** appear to play a role as demonstrated by the increased prevalence of AIHA and IMT seen in certain breeds and family lines
- The **administration of vaccines** has been examined as a potential trigger of immune-mediated disease. It appears that vaccines may trigger animals with the proper genetic predisposition, but that vaccination alone is not sufficient in and of itself to cause immune-mediated disease.
- **Bacterial or viral infections** may also trigger "flares" of immune-mediated disease; however, infection by itself does not cause IMHA or IMT.
- **Environmental factors** such as toxins, radiation and sunlight may also cause flares.

In most cases, however, no obvious factor is determined that triggers the onset of disease.

What are the symptoms of immune-mediated diseases?

IMHA involves the destruction of red blood cells, the function of which is to carry oxygen. When red cells are decreased, less oxygen is available to the cells of the body.

Some possible symptoms of **IMHA** include:

- Weakness
- Labored breathing
- Jaundice (yellow discoloration) of the eyes and mouth
- Darkened urine

IMT involves the destruction of platelets, whose function is to stop bleeding. When platelet numbers drop below a critical number spontaneous bleeding occurs.

Symptoms of **IMT** may include:

- Bruising of the skin
- Nose bleeds
- Blood in urine or stool
- Bleeding into vital organs, i.e. the brain or spinal cord - this can be life threatening

What tests are needed?

Most pets with an immune-mediated disease are diagnosed in middle age, and purebreds are more frequently affected than mixed-breed dogs. Hereditary factors are involved but the exact genes associated with immune-mediated disease are unknown.

The diagnostic steps undertaken when IMHA or IMT is suspected may include:

- Blood work
- Urine testing
- Fecal analysis
- Bone marrow analysis
- X-rays and ultrasound are used to detect abnormalities of internal organs

Testing for underlying or concurrent disease can only be made by excluding the presence of other diseases that may affect the blood cell counts, such as cancer or infection.

What treatment is available?

Treatment of immune-mediated disease involves ("toning-down" the immune system. The presence of infection must be carefully excluded since "toning-down" the immune system could allow infection to spread. The treatment most commonly used to suppress the immune system is prednisone and high doses are initially administered until good response is seen.

Side effects of prednisone are common during the high dose phase of treatment and include:

- Increased thirst
- Increased appetite
- Increased urination
- Panting

Although side effects develop in most pets, they are not harmful in the long term and will disappear as the dose of prednisone is tapered. Weight gain is particularly troublesome and limitation of food intake is essential. It is important that prednisone never be abruptly stopped and dosage reductions be made gradually. Excessive urination may be lessened by restricting water intake after bedtime; however, restrictions should be discussed with your veterinarian.

If side effects are excessive, a different corticosteroid (such as triamcinolone or dexamethasone) may be substituted. Long-term use of corticosteroids (greater than a few months) may cause sagging of the stomach and poor hair coat. The dose of prednisone may be decreased by the addition of a supplemental immunosuppressive medication such as azathioprine, chlorambucil, or cyclosporine. You should discuss the benefits and risks of additional immunosuppressive medication with your veterinarian. Certain

vaccines may trigger flares of immune-mediated disease and their administration should be discussed with your veterinarian.

What is the prognosis?

The prognosis for IMHA and IMT is difficult to predict. Response generally takes a minimum of 3-5 days to begin. Some animals respond to medication and never experience a relapse while other cases do not respond to any medication. The majority of dogs and cats respond somewhere in between these two extremes: blood counts may normalize but later fall as immunosuppressive medications are tapered. For these pets a maintenance dose of medication is required.

To determine your pet's need for long-term therapy, medication doses are slowly tapered while blood counts are monitored to detect relapse. With frequent monitoring it is usually possible to detect blood count changes prior to the development of outward signs to illness. In general, blood counts are rechecked 1-3 weeks after a dosage change is made and then rechecked again just prior to any additional change. Dose-weaning usually takes place over a 4 to 6 month period.

Relapses are treated with increased drug administration and consideration is then given to long-term maintenance therapy. If maintenance therapy is necessary, periodic evaluation for medication-related side effects (such as weight gain or urinary tract infection) is appropriate. It is difficult to predict which pets can be weaned completely off medication and which will need maintenance therapy.

Long-term therapy is not without risk, but with close veterinary supervision, many dogs and cats with IMHA and IMT live long, normal, and happy lives.