

HYPERADRENOCORTICISM

About the Diagnosis

Hyperadrenocorticism is a disorder caused by abnormally high levels of corticosteroid (cortisone-like) hormones. Corticosteroids are natural hormones produced by a pair of small glands called the adrenal glands. The adrenal glands are located inside the abdomen, near the kidneys of dogs, cats, humans, and most mammals. The function of the adrenal glands is to make substances that are essential to life, including the corticosteroid hormones. The production of these hormones needs to be closely controlled in the body, since excesses or deficiencies can cause illness. Normally the pituitary gland (a small gland at the base of the brain) regulates adrenal hormone production. Excess production of corticosteroid hormones, or hyperadrenocorticism, is usually caused by a tumor either of the adrenal gland or the pituitary gland. This occurs either directly (with an adrenal tumor, which itself overproduces corticosteroids) or indirectly (with a pituitary tumor, which overproduces the substance that functions to signal the adrenal gland to make more corticosteroid hormones), with the majority of cases occurring as a result of indirect, or pituitary-based, overproduction.

A similar situation occurs with iatrogenic hyperadrenocorticism, where cortisone or cortisone-like medications given to a patient produce the symptoms of hyperadrenocorticism. Such medications are commonly used for treating conditions such as skin diseases or arthritis, and avoiding iatrogenic hyperadrenocorticism is one of the reasons recheck examinations, periodic blood testing, and possibly other tests are recommended when pets are taking cortisone-type medications. Corticosteroids are powerful hormones that affect almost all systems of the body, including the skin, bones, muscles, reproductive system, and immune system. They are frequently used in therapy because of their potent anti-inflammatory effects.

When hyperadrenocorticism occurs, it usually affects middle-aged to older dogs; cats very rarely have hyperadrenocorticism. Symptoms of hyperadrenocorticism vary considerably from one animal to the next and depend upon the level of hormone overproduction and duration of the condition. Drinking and urinating more than normal is a common sign. Muscles may shrink, and the pet may show weakness as a result. Muscle weakness and an enlarged liver can cause a pendulous belly in an animal that is not overweight. Skin changes can include a very thin hair coat, blackheads, hard plaques due to mineral deposits, a darkening of the color of the skin, and thin, fragile skin. Nonneutered pets may develop atrophy of the testicles (male) or failure of normal heat cycles (female). Obesity, panting, and paralysis of nerves in the face are other signs that are sometimes present. This group of symptoms seen in hyperadrenocorticism is called Cushing's disease or Cushing's syndrome.

Routine blood tests and specialized confirmatory tests are warranted in patients showing symptoms of this sort because many other completely different diseases (such as diabetes and others) may cause similar symptoms, and an accurate identification of the exact cause is essential for proper treatment. Routine lab tests, including a complete blood cell count, blood biochemistry profile, and urinalysis, will typically show some nonspecific changes in affected pets, and these tests are appropriate as a first line of evaluation to eliminate the possibility of other conditions. A series of specific tests designed to measure the response of the adrenal glands to the administration of hormones is needed to make a definite diagnosis. These tests are simple blood tests, but since they measure the adrenal gland's response over time, it is usually necessary to leave a dog in the hospital for several hours or the whole day for the 2 to 3 blood samples that need to be drawn during these tests. Based on these results, a treatment plan should be possible. However, in some individuals, the results of confirmatory tests are ambiguous and require abdominal x-rays, abdominal ultrasound, or MRI or CT scans to identify whether a tumor can be seen directly in the adrenal glands or in the pituitary gland (brain). These advanced tests are needed in some, but not all, dogs with hyperadrenocorticism.

Living with the Diagnosis

Lifelong treatment is needed for hyperadrenocorticism, and this consists of medications given by mouth every day or every few days and periodic rechecks with the veterinarian. An exception is pets with hyperadrenocorticism caused by an adrenal tumor, where the treatment is surgical removal. Untreated, hyperadrenocorticism becomes progressively worse over months to years.

TREATMENT

If your pet's hyperadrenocorticism is caused by administration of corticosteroid (cortisone-like) medications for a chronic condition, other treatment options must be found to allow the reduction or elimination of the corticosteroid

treatment. It is important to not stop the corticosteroid medication suddenly, because the body typically has become dependent on it and abrupt termination can cause life-threatening symptoms. Rather, you should discuss a time frame with your veterinarian during which you can taper the dose gradually before stopping.

If your pet's hyperadrenocorticism is caused by an adrenal tumor, surgery to remove the tumor is the treatment of choice. After surgery, corticosteroids will need to be given by mouth for several weeks. The remaining adrenal gland will be shrunken and inactive, so supplementation is necessary for several days to a few weeks until it gradually becomes fully functional again.

If your pet's hyperadrenocorticism is caused by a pituitary tumor or by an adrenal tumor that is inoperable (for example, a tumor that is pressing against or attached to vital structures), then lifelong treatment with drugs that suppress the adrenal glands is necessary. The goal of treatment is to suppress the excessive production of corticosteroid hormones by the adrenal glands, but without going too far. Corticosteroids are essential to life, but in appropriate amounts. Therefore, the medication dosage needs to be tailored to each individual over days to weeks, in order to find a balance between suppressing the excess corticosteroid production without depriving the body of a baseline minimum amount of corticosteroid.

Several antiadrenal drugs are available, and the most common is mitotane (also called Lysodren, or o,p'-DDD). Initially, for the first several days, a higher (loading) dose is given to decrease adrenal corticosteroid production. During this time, the pet must be monitored closely by you at home. After your pet's condition has been brought under control, the mitotane dose will be reduced to a maintenance level.

Complications of treatment are indicated by apathy, weakness, lack of appetite, vomiting, or diarrhea. If these signs occur, call your veterinarian without delay. Do not administer more of the antiadrenal drug until instructed to do so (typically, no more antiadrenal drug for several days at least). If these symptoms occur, you may have been provided with a medication, prednisone, for this exact situation. If that is the case, you should administer the prednisone as prescribed. In most cases, such symptoms are caused by an excessive suppression of corticosteroid production, and withholding the antiadrenal drug as directed by your veterinarian can allow the adrenals to resume production of corticosteroids.

Cats with hyperadrenocorticism do not respond as well to antiadrenal medications as do dogs. Surgery often is preferable in cats with hyperadrenocorticism due either to pituitary tumors or adrenal tumors. Removal of both adrenal glands prevents the overproduction of corticosteroids due to a pituitary tumor, but the cat is then dependent upon owner-administered corticosteroid replacement medications (in pill form) for the rest of its life. Animals cannot survive with a complete lack of corticosteroids. Surgical removal of the pituitary tumor has been described in cats and may become the treatment of choice in the future, but is extremely challenging and carries extensive risks.

DOs

- Realize that many, very different diseases produce symptoms that are identical to the symptoms of hyperadrenocorticism. Therefore, correctly determining whether hyperadrenocorticism is present or not in your pet requires a series of specific tests that are aimed at making sure that the condition is identified properly and the best medication chosen.
- Give all medication exactly as directed.
- Give a dose of prednisone if you suspect your pet is having a reaction to mitotane treatment.
- Monitor water consumption and appetite as indicators that antiadrenal treatment is working (water consumption and appetite should decrease somewhat). A complete lack of appetite or refusal to drink may be the sign of excessive antiadrenal drug treatment and warrants a phone call to the veterinarian.

DON'Ts

- If your pet requires maintenance corticosteroid replacement therapy, do not discontinue treatment or miss doses. Your pet is completely dependent upon the medication and cannot survive without it.

When to Call Your Veterinarian

- When giving mitotane, lack of appetite or other signs of illness should be reported to your veterinarian promptly.
- If any of the signs listed below becomes apparent.

Signs to Watch For

- Apathy, weakness, lack of appetite, vomiting, or diarrhea may indicate an adverse reaction to mitotane and possibly an emergency situation.

Routine Follow-Up

- Periodic testing is needed to monitor response to mitotane therapy. During the initial treatment period, testing may be needed every few weeks. After the dose has been adjusted to the maintenance level, the treatment should be monitored by laboratory testing every 6 to 12 months.