Canine Addison's Disease

(Hypoadrenocorticism)

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Addison's disease is a hormonal disorder that affects many species, including canines. It generally affects young to middle-aged dogs and mostly females in general. This disease can mimic the symptoms of many other illnesses and will, more often than not, lead to misdiagnosis of the true identity of the illness. Once the symptoms display themselves, and if they are misdiagnosed, it can be deadly and fatal to the animal. However, if it is quickly and properly diagnosed the animal can, with proper hormone substitution, live a happy and healthy life for many years. Addison's is assumed to be an uncommon disease but, because it is so widely misdiagnosed, no one knows the true extent of it.

Addison's disease is so named after the 19th century doctor Thomas Addison who originally described the effects of the failure of the adrenal glands (also called hypoadrenocorticism or primary adrenal insufficiency – Addison's is easier to say). The first case of Addison's in dogs was identified in the 1950's.

Addison's disease (or primary adrenal insufficiency) occurs when the adrenal glands (or suprarenal glands) are so severely damaged they can no longer produce hormones. This is mainly caused by an autoimmune response in the body that attacks the adrenal glands. Failure of the adrenal gland to produce sufficient hormones because of a problem elsewhere in the body (such as a tumour on the pituitary) is called 'secondary' adrenal insufficiency.

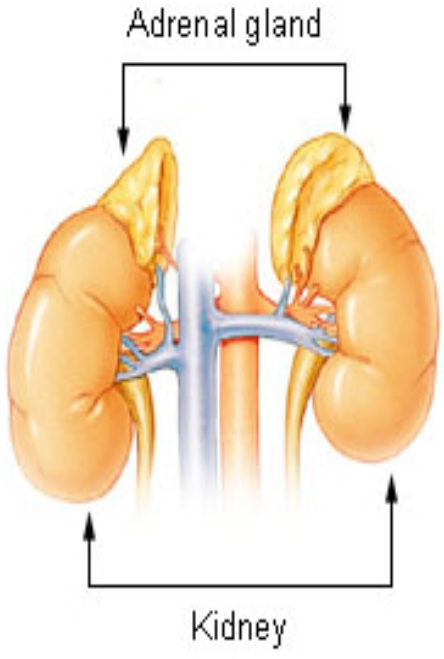
The symptoms for Addison's disease can vary somewhat and will depend on the individual dog. Often the symptoms can appear over the dog's lifetime, each attack becoming more severe as the dog ages until the adrenal gland fails completely. Some of these attacks will not be noticed or will not raise a concern by the pet's owners. Indeed, after the confirmed diagnosis of Addison's and an explanation of the symptoms by the veterinarian, the clues to the progression of the disease may well be realized. As the dog gets older (and sometimes in very young dogs also) the symptoms that develop may include periods of lethargy, lack of appetite, perhaps vomiting and diarrhea. Dark stools may also be noticed. A big clue is weakness and unsteadiness in standing and walking, and dehydration. However, these are often clues to other illnesses such as gastrointestinal upset or gastroenteritis ('stomach flu'). The animal may

even be considered to be depressed. A more serious misdiagnosis can include kidney or liver disease or poisoning. If the animal is taken to the veterinarian, they may prescribe antibiotics and painkillers to treat the symptoms. As often will be the case, in a few days the animal may recover, seemingly confirming the veterinarian's diagnosis. Sometimes there is tenderness in the abdomen or the hindquarters, so the vet may also consider pancreatitis. But these can also be symptoms of Addison's.

The disease progresses until potassium and sodium levels drift too far from normal, leading to low blood volume, a drop in blood pressure, and renal failure. If the condition progresses to this point, the dog's owner will notice that the animal will be completely lethargic, often unable to raise its head but seemingly still watching their owner. They will not eat (and may not have eaten for several days). They will become extremely dehydrated with signs of possible kidney failure. Tremors may also occur. While the symptoms can gradually get worse, it can often appear suddenly as the animal goes into shock. This is an Addisonian crisis (or acute adrenal crisis) and the animal is in grave danger.

Although Addison's is often claimed to be a random disease and not hereditary, it does occur more often in some breeds than others and has a familial predisposition. As mentioned previously, it largely results from an autoimmune response in which the body's immune system attacks the adrenal glands. Autoimmune diseases are likely genetic in nature and therefore can be considered hereditary (in my mind).

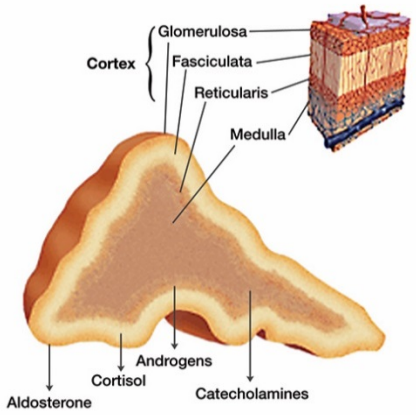
Dogs, in which the vet may suspect Addison's, will be given an intravenous with the appropriate steroids may recover quickly as the body rehydrates and the hormonal steroids stabilize the body functions. But this is only a temporary situation and the animal, without medicinal and hormonal maintenance will quickly deteriorate again.



Dogs suspected of Addison's should be given an ACTH (adrenocorticotropic hormone) stimulation response test to determine if the ailment is Addison's. Cortisol levels are measured in a blood sample taken before the test, the injection of the hormone ACTH is given and the levels of cortisol are measured an hour later. If there is no increase in the levels of cortisol, then the adrenal glands are not functioning and Addison's is confirmed. Other tests may also be useful and necessary.

THE ADRENAL GLANDS

Dogs have two small adrenal glands (one located at the top of each kidney). Oddly enough for a single organ, the adrenal glands are divided into two major sections, which differ entirely in function and structure.



In the centre of the gland is located the adrenal medulla. The medulla actively secretes hormones in times of physical or psychological stress. The most important being epinephrine (adrenaline) that regulates the stress response of 'fight or flight' - readying the body for those activities. It also secretes the hormone norepinephrine (noradrenaline) which increases blood pressure.

Surrounding the medulla is the adrenal cortex. The cortex is divided into the following 3 sections:

Zona Glomerulosa; produces and secretes mineralocorticoids, most importantly aldosterone. Aldosterone affects the movement of sodium and potassium ions across cell walls. It is responsible for the secretion of potassium and helps retain sodium from the kidney (renal) tubules, thus maintaining the body's water balance, while helping control blood pressure. Without mineralocorticoids, the potassium levels increase and sodium decreases. This is the basic definition of Addison's disease and is life threatening.

Zona Fasciculata; secretes glucocorticoid hormones. This is the largest section of the adrenal gland and secretes the hormones cortisol (hydrocortisone) and corticosterone. These hormones regulate the metabolism of carbohydrates, proteins, and lipids. They regulate the production of glucose, control fat production and the breakdown of fatty tissues to use as a source of energy (during times of stress). Glucocorticoids also

suppress inflammatory reactions and regulate the body's immune response.

Zona Reticularis; This section is responsible for secretion of sex hormones, such as androgens.

The loss of the adrenal glands' natural hormone production, essential for healthy body function (namely glucorticoids and mineralocorticoids), must be replaced for life to continue. The vet will prescribe commercially synthesised steroid hormones that can be administered at regularly determined intervals. Testing of the dog to determine the proper dosage is important over time to establish both dose and effects on the animal. Continual testing will also be needed to adjust the dosage as required over time.

The Addisonian patient will need hormonal replacements such as prednisone, prednisolone, and hydrocortisone at regular intervals for the rest of their lives. Although very expensive, a treatment with Percoten, injected every 3 to 4 weeks as determined by the vet will have fewer side effects and better body regulation of electrolytes than other medicines. The biggest disadvantage to Percotin is that regular intake of prednisone is required and may need to be increased in times of stress. This may require doubling the dosage and frequency. The need will be determined by the individual patient. Anything outside of the pet's normal routine such as visitors, kennelling, excessive noise, or trips to the vets can be considered stress. Understanding your dog and implementing long-term stress management is vital to your dog's wellbeing and happiness.

I hope this information can help enlighten you on the effects of Addison's. This is only a summary of the Addison's condition and additional information is available online. The important thing is this: trust your gut feeling. If your pet is not feeling well and some of the symptoms mentioned here are present, then be wary of any prognosis that may dismiss the situation as serious. Remember the past situations when your dog was previously ill, were the symptoms the same; are they getting worse? Have a blood test done to either confirm or dismiss the Addison's condition. Help your vet by suggesting the possibility.

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