Rx: Lupron Depot for Ferret Adrenal Disease

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Lupron®, or leuprolide acetate, is a drug that is used to treat adrenal disease in ferrets. "Depot" refers to how it works - it releases the entire dosage over a set period of time. Lupron is a synthetic agonist version of GnRH (gonadotropin releasing hormone), but what does that mean? How does it work to treat the symptoms of adrenal disease? There is a lot of information available, but much of it is written in rather confusing medical terms. This article will attempt to break the available information down into a more understandable explanation of the medical benefits of Lupron for ferrets.

What happens in an adrenal ferret?

In a normal, neutered or spayed ferret, the hypothalamus controls the pituitary gland, which controls the adrenal glands.

Hypothalamus **Pituitary Gland** **Adrenal Glands**

The hypothalamus releases GnRH in short bursts or pulses, not steadily. In response to the GnRH, the pituitary gland releases two hormones called "luteinizing hormone" (LH) and "follicle-stimulating hormone" (FSH). These hormones travel via the bloodstream to the gonads (ovaries and testicles) and adrenal glands in an intact ferret, or to the adrenal glands in a spayed or neutered ferret. Both the gonads and the adrenal glands then produce other hormones, including hormones responsible for reproduction, such as estrogens (female hormones) and androgens (male hormones). These are often termed "sex hormones."

So, the process (in a neutered or spayed ferret) looks something like this:

Hypothalamus produces GnRH **Pituitary Gland produces LH and FSH** **Adrenal Glands produce sex hormones**

When a ferret has adrenal disease, the following happens:

- The hypothalamus secretes too much GnRH - a steady stream rather than the short bursts it is supposed to
- The pituitary is over-stimulated by the GnRH, causing excessive production of LH and FSH
- The adrenal glands are over-stimulated by the LH and FSH
- Sex hormones are overproduced by the adrenal glands and released into the body
- The ferret starts showing signs of adrenal disease

This is what the process in a ferret with adrenal disease looks like:

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Hypothalamus overproduces GnRH

Pituitary Gland is over-stimulated and produces LH and FSH

Adrenal Glands are over-stimulated by Pituitary Gland and overproduces sex hormones

The most common treatment used to be surgery, but medical treatment using Lupron is becoming more prevalent for a variety of reasons, including the comparative success rates of surgery vs medication, cost, and veterinary preferences.

What does Luprolide (Lupron) do?

As mentioned above, Lupron actually inhibits the actions and effects of GnRH. When a ferret is given Lupron, it initially causes an increase in the pituitary's production of LH and FSH. This causes a spike in the production of sex hormones by the adrenal gland. After a few weeks of continuous exposure to Lupron, this spike causes the pituitary gland to stop responding to both the Lupron and the GnRH, even though both are present. As a result, little or no LH or FSH are produced, which leads to a decrease in the production of female and male sex hormones.

Lupron

Little or no LH or FSH is produced

Little or no production of sex hormones

hypothalamus GnRH →

Pituitary

Adrenal Glands

In most cases, symptoms of adrenal disease will start to disappear within two to four weeks. For those ferrets who have significant hair loss, the hair may or may not grow back, but it can often take up to four to five months.

It is important to note that the decreased production of LH and FSH is reversible. This means that if the Lupron therapy is discontinued, the pituitary gland will start to produce LH and FSH again, and the adrenal glands will once again be over-stimulated. To achieve the desired affect, Lupron must be administered for the rest of the ferret's life. There is also a chance that the dosage may need to be increased because the ferret stops responding to it.

How effective is Lupron?

Figures show that about 80% of ferrets will react positively to Lupron Depot. There are three types of adrenal tumors: hyperplasia, adenomas, and carcinomas. Lupron is not very effective in cases of carcinoma, but in that case, surgery is frequently ineffective as well. How long your ferret will benefit from Lupron is impossible to quantify, but some ferrets have survived as long as two years on Lupron Depot injections.

Note: Lupron is a treatment, not a cure! It can reverse many symptoms, including hair loss, sexual aggression, and swollen vulvas. However, in most cases, it will not shrink the tumor, and it will never eliminate the disease. The only thing that may cure the disease is surgery, but even surgery is not 100% effective. Many ferrets that have surgery will develop further tumors, and require additional surgery or Lupron therapy.

What kind of Lupron is used in ferrets?

There are three kinds of Lupron Depot that may be prescribed for ferrets - 1 month, 3 month, and 4 month. Most studies and experience have been with the once-a-month product. Discuss with your veterinarian which would be best for your ferret and what dosage is appropriate. Make sure you are aware of which kind you are using so you can schedule veterinary visits accordingly and avoid accidentally missing a dosage.

The 24 hour Lupron is not used in ferrets. It would need to be administered every day to be effective, which is not cost effective. Additionally, giving your ferret a daily injection of Lupron will result in multiple bursts of heightened activity in the pituitary with only brief periods of inactivity (remember, there is an initial flare of LH and FSH production before the pituitary is desensitized), so it could actually have a negative effect on your ferret.

Is Lupron right for your ferret?

This is something that you will need to discuss with your veterinarian. In many cases, ferrets with adrenal disease are treated with Lupron rather than surgery because they have medical problems that preclude surgical procedures. However, the use of Lupron is becoming more common, and it's something that you and your veterinarian will have to decide on a case by case basis.

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