

SO CALLED “ALOPECIA-X” OR “WE ALL KNOW IT WHEN WE SEE IT, BUT WHAT IS IT REALLY?”

DERMATOLOGY

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Growth Hormone—Responsive Dermatitis (Adult-Onset Hyposomatotropism, Pseudo-Cushing’s Syndrome)

Etiology

Unknown, possible deficiency in growth hormone that develops after maturity, atrophy of pituitary gland in one case, proposed adrenal sex hormone abnormality.

Breed Predilection

Chow chows, keeshond, pomeranian, miniature poodle.

Age and Sex Predilection

One to three years of age and intact male dogs.

Clinical Features

Bilaterally symmetrical alopecia and hyperpigmentation—primarily *neck*, perineal and genital regions, tail, posterior and medial thighs, ventral abdomen. Excess scaling and dull, dry hair coat, fuzzy hair coat, changes in hair coat color, regrowth of hair in areas of full thickness trauma to the skin. Appears clinically similar to castration-responsive dermatosis.

Diagnosis

Skin biopsy—consistent with endocrinopathy, presence of eosinophilic tricholemmal keratinization (“flame follicles”).

Growth hormone stimulation test—see pituitary dwarfism. Low or normal baseline growth hormone levels with a poor response to stimulation (xylazine) can be normal for pomeranians.

Must differentiate from castration-responsive dermatosis (measure serum estradiol, progesterone, and testosterone) and adrenal sex hormone dermatosis.

Treatment

Growth hormone treatment (bovine)—2.5 units (less than 14 kg)—5.0 units (greater than 14 kg) SQ every other day for 10 injections. Should see response within 3 months. Effective for 6 months to 3 years. Many cases have not responded completely. May induce diabetes mellitus, acromegaly. Hormone is very difficult to obtain. Human growth hormone—0.15 IU/kg SQ twice weekly for 6 weeks.

Castration-Responsive Dermatitis

Etiology

A mild to moderate elevation of serum estradiol in intact male dogs. Histologically normal testicles with normal descent of testicles.

Breed Predisposition

Pomeranian, chow chow, miniature poodle, keeshond.

Sex Predisposition

Intact male dogs.

Clinical Features

Bilaterally symmetrical alopecia and hyperpigmentation: affects the neck, perineal and genital region, tail, posterior and medial thighs, ventral abdomen. Excess scaling and dull, dry hair coat, fuzzy hair coat, changes in hair coat color, regrowth of hair in areas of full thickness trauma to skin. History of normal descent of testicles that palpate normal on physical examination

Diagnosis

History and physical examination.

Reproductive hormones: Mild to moderate elevations in estradiol. Also measure progesterone and testosterone.

GnRH response test—0.1 ug/lb GnRH (Cystorelin) IV, take baseline + 1 and 2 hour post-GnRH samples.

May have multiple endocrine abnormalities revealed on TSH response test, cortisol function test, growth hormone stimulation tests.

Skin biopsy: Consistent with an endocrinopathy, brightly eosinophilic tricholemmal keratinization (“flame follicles”).

Testicular biopsy—normal.

Treatment

Castration—response in 2–3 months.

Adrenal Sex Hormone Dermatitis

Etiology

Defect in adrenal steroidogenesis, a partial 21-hydroxylase enzyme deficiency proposed. Results in increased serum progesterone, 17-hydroxyprogesterone, dehydroepiandrosterone (DHEAS), androstenedione. Elevated basal plasma ACTH.

Breed Predisposition

Pomeranian, chow chow, keeshond, samoyed.

Sex Predisposition

Intact male and female dogs.

Clinical Features

Bilaterally symmetrical alopecia and hyperpigmentation—affects the neck, perineal and genital region, tail, posterior and medial thighs, ventral abdomen. Excess scaling and dull, dry hair coat, fuzzy hair coat, changes in hair coat color, regrowth of hair in areas of full thickness trauma to the skin. Appears clinically similar to Growth Hormone—Responsive Dermatitis and Castration Responsive Dermatitis.

Diagnosis

History and physical exam.

ACTH stimulation test—Reproductive hormone panel: baseline EDTA and clot tube samples, give 0.5 IU/kg ACTH (Cosyntropin) IV, collect 1 hour post-ACTH samples. Samples measured for cortisol, 11-deoxycortisol, DHEAS, androstenedione, 17-hydroxyprogesterone, progesterone, testosterone, and estradiol.

Growth hormone stimulation test—may have concurrent poor responsiveness to xylazine stimulation.

Skin biopsy—consistent with an endocrinopathy, presence of eosinophilic tricholemmal keratinization (“flame follicles”).

Treatment

o.p’-DDD (Lysodren)—15–25 mg/kg, SID for 5 days, then q 7–14 days as maintenance. Monitor cortisol function with ACTH response test.

Ketoconazole (Nizoral)—30 mg/kg, divided BID-TID. Decreases cholesterol synthesis, decreases serum basal cortisol and testosterone. Increases serum basal progesterone and 17-hydroxyprogesterone.

Growth hormone treatment.

Methyltestosterone—0.5 mg/lb q 48 h (maximum dose of 30 mg/dog) x 30-60 days, then 1-2x weekly.

Melatonin—3-6 mg/dog TID.

Trilostane—5-10 mg/kg/day.

Alopecia X—Latest Theories

Follicular growth dysfunction of plush-coated breeds with a primary hair follicle receptor defect.

Abnormal receptor response to a normal hormone signal—similar to male pattern baldness.

Genetically determined disease—Multi-genetic trait, pomeranians as the prototype, may be similar in the chow chow, keeshond, samoyed, Siberian husky, Alaskan malamute.

Selective breeding for the trait neotony—retention of the juvenile prototype; retention of the “puppy coat” (plush coat).

Mild but prolonged increase in basal cortisol—normal ACTH response tests; increased urinary cortisol/creatinine ratio; slightly enlarged adrenals on abdominal ultrasound.

Alopecia X—Treatment Approach

Castration or OHE—Treatment of choice if intact.

Melatonin—alters sex hormone levels, increase in growth hormone factors. Dosage of 1-6 mg/dog TID; potential side effects of lethargy and insulin resistance.

Benign neglect—only an aesthetic disease—“Buy the dog a sweater.”

Testosterone—0.5 mg/lb q48h (max dose of 30 mg/dog) x 30-60 days, then 1-2 x weekly; potentially hepatotoxic.

Finasteride (Propecia®, Proscar®)—5 alpha-reductase inhibitor, blocks DHT production: 5 mg/dog—SID.

Leuprolid acetate (Lupron®)—Synthetic analog of GnRH; causes decreased endogenous GnRH production, decreased FSH and LH, decreased sex hormones: 100 ug/kg IM for q 4-8 weeks. Side effects include panting, anxiety—“hot flashes.”

Topical Cyproterone—blocks DHT receptors.

Mitotane (Lysodren®)—15-25 mg/kg—SID x 5 days, then q 7-14 days as maintenance; hypoadrenocorticism potential.

Trilostane (Vetoryl®, Modrenal®)—5-10 mg/kg SID, dogs with cardiac disease at risk; hypoadrenocorticism potential.

Cyclosporine (Atopica®)—5 mg/kg SID, vomiting/diarrhea. gradually increase dosage. IF vomiting persists can use:

Metoclopramide (Reglan®)—0.2-0.5 mg/kg TID concurrently. Side effects include psoriasiform-lichenoid drug eruption, gingival hyperplasia, hypertrichosis, increased risk of neoplasia—lymphosarcoma?

Dermal abrasion—based on observation of r-growth of hair at sites of full thickness skin trauma (skin biopsies and incision sites); use of a dishwashing “Scotch pad!”