Purpose. To describe the clinical and laboratory findings, hormone replacement therapy and outcome of three dogs with Sudden Acquired Retinal Degeneration (SARD). Methods. Data were collected retrospectively from the general practice charts of one female and two male dogs (all castrated) with persistent signs of PU, PP, lethargy, confusion, agitation/panting, aggression and obesity. Mean age = 11 years. An endocrine/immune (E&I) panel (National Veterinary Diagnostic Services, Quail Valley, CA) was performed for all dogs. Mean time interval from SARD onset = 4.58 months. Range = 4.0–5.75 months. Initial E&I panels identified low levels of immunoglobulins (IgA, IgG and IgM), low cortisol and elevated estrogen in all dogs. T3 and T4 fell within the bottom 28% of normal range. General practice veterinarians initiated hormone replacement with triamcinolone acetonide injectable glucocorticoid (Fort Dodge Laboratories, Overland Park, KS or Bristol-Myers Squibb, Princeton, NJ) followed by low-dose oral methylprednisolone (Vintage Pharmaceuticals, Charlotte, NC or Pharmacia, Kalamazoo, MI) and oral levothyroxine (Lloyd, Inc., Shenandoah, IA). E&I panels were repeated between 1.0–5.5 months. Mean interval = 3.5 months. Results. All dogs demonstrated a shift toward normal immunoglobulin, estrogen and cortisol levels. T3 and T4 rose toward the mid-normal range in all dogs. Clients reported full resolution in 43% (mean) of clinical signs and “some improvement” in 36% (mean).

Conclusion. These dogs demonstrated concurrent levels of elevated estrogen and low cortisol—a pathological pattern of steroidogenesis described as adrenal exhaustion. Clinical signs were associated with hyperestrogenism rather than hypercortisolism. Low-dose glucocorticoid and thyroid hormone replacement had a positive effect on both clinical presentation and laboratory findings. Supported by Lantern Publications. None.
SARD, adrenal activity, and hormone replacement — retrospective study

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PURPOSE

Describe the clinical and laboratory findings, hormone replacement therapy, and outcome of four dogs with Addisonian Acquired Retinal Degeneration (SARD).

ANIMALS STUDIED

- 4-6 months post-SARD onset
- Male = 2, female = 1, mean age = 11 years
- Diagnostic staging:
  - Elevated estrogen
  - Low cortisol
  - Low-normal T3, T4
  - Immune bulblul

METHODS

General practice veterinarians initiated hormone replacement therapy to augment low cortisol and low-normal thyroid levels:

- Prednisolone PO single dose
- Thyroxine PO bid
- 0.13 mg/day
- 0.09 mg/day
- Endocrine & immunology panels were repeated. Range: 1.0-5.5 months.

RESULTS

- All dogs demonstrated a shift toward normal estrogen, cortisol, thyroid, and immune bulblul levels.
- Owners reported complete resolution in 43% (mean) of adrenal signs and "signing improvement" in 36% (mean).

DISCUSSION

Clinical signs of hypoadrenalinism are a common feature of SARD. Early on, researchers speculated that this was the physiological response to stress. Elevated adrenal sex hormones have also been reported within the first year of SARD. One interpretation for this pattern is Selye's model of stress adaptation which describes the progression from adrenal gland hypertrophy (hypoadrenalinism) to adrenal gland exhaustion (hypoadrenalinism).

The stress response:

- Alarm phase — normal response to stressors — HPA axis activation
- Resistance phase — follows a prolonged period of stress. Cortisol production is slightly elevated, desensitizing the HPA feedback loop. Cortisol production continues unabated.
- Exhaustion phase — cortisol production falls. Prenocorticoids accumulate and shift to sex-hormone production. The dogs described here developed adrenal exhaustion within 4-6 months of blindness.

Adrenal sex-hormone production during exhaustion phase

- Elevated estrogen mimics clinical signs of elevated cortisol including: puDDle, lethargy, depression, confusion, agitation, seizures, hemo, marrow and immunoglobulin suppression, thyroid binding, estrus, and a 17-OH progesterone.
- Elevated progesterone and estradiol result in polyphagia, heat intolerance, diarrhea, obesity, and hypoadrenalinism.
- Severe hypoadrenalinism causes anorexia, vomiting, diarrhea, weakness, organ failure, and death.

CONCLUSION

These dogs demonstrated serious levels of elevated estrogen and low cortisol — a pattern of signs/gremitism described as adrenal exhaustion. Clinical signs were the result of hyperestrogenism rather than hypoadrenalinism. Low-dose glucocorticoid and thyroid hormone replacement had a positive effect on clinical presentation and laboratory findings. Owners should be encouraged to pursue adrenal testing and hormone replacement therapy for signs of adrenal exhaustion.

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