



DIETARY HYPERTHYROIDISM IN DOGS FROM DR. JEAN DODDS' PET HEALTH RESEARCH BLOG

This important study about canine hyperthyroidism - which is rare - comes from my colleague, Dr. Mark Peterson, with whom I have worked on feline hyperthyroidism issues. Recently, I had such a referral case myself of a healthy 3 year old mixed breed dog that suddenly tested as hyperthyroid after eating raw beef treats for a month; thyroid scintigraphy was normal.

from: B. Köhler B, C. Stengel, and R. Neiger; J Sm An Pract 2012; 53 (3), 182-184

Background

While hypothyroidism is a common endocrine disorder in dogs, canine hyperthyroidism is rare. Like cats with hyperthyroidism, most dogs with naturally occurring hyperthyroidism have a functional thyroid tumor (1, 2). However, unlike the situation in hyperthyroid cats, where most thyroid tumors are benign, almost all of these hyperthyroid dogs will have thyroid carcinoma. Therefore, the prognosis is generally guarded to poor.

Exogenous hyperthyroidism, a result of excessive intake of thyroid hormones, is rarely recognized but generally results from excessive administration of L-T4 for treatment of hypothyroidism (1, 2). In humans, however, excessive consumption of meat contaminated with thyroid tissue has resulted in exogenous hyperthyroidism (3,4). This report by Köhler et al (5) is the first to report this syndrome of dietary hyperthyroidism in dogs.

Objectives

To evaluate hyperthyroid dogs with high plasma thyroxine (T4) concentrations fed raw food, before and after changing the diet.

Methods

Between 2006 and 2011, 12 dogs presented with an high plasma T4 concentration and a dietary

history of feeding raw food.

Plasma concentrations of T4 and thyroid-stimulating hormone (TSH) concentrations were measured initially and after changing the diet.

Results

Twelve dogs were presented with a median age of five years. The median plasma T4 concentration was very high at 156 nmol/L ($\approx 12 \mu\text{g}/\text{dl}$). In six dogs, thyroid-stimulating hormone concentration was measured and was low in five dogs and normal in one. Six dogs showed clinical signs consistent with hyperthyroidism, such as weight loss, aggressiveness, tachycardia, panting and restlessness; the other six dogs had no clinical signs. After changing the diet, eight dogs were reexamined and serum T4 concentrations normalized in all dogs, with resolution of all clinical signs of hyperthyroidism.

Conclusions

Dietary hyperthyroidism can be seen in dogs on a raw meat diet or fed fresh or dried gullets (which include thyroid tissue). High circulating T4 concentration in a dog, either with or without signs of hyperthyroidism, should prompt the veterinarian to obtain a thorough dietary history.

Dr. Peterson's "Bottom Line":

In man, community-wide outbreaks of

“hamburger thyrotoxicosis,” resulting from inadvertent consumption of ground beef contaminated with bovine thyroid gland, have been previously reported (3,4). **These outbreaks resulted in the banning of “gullet trimming,” in which meat in the neck region of slaughtered animals is ground into hamburger. Because thyroid tissue is similar in color to muscle meat, it is possible for gullet trimmers to include the thyroid gland when meat is ground into hamburger or sausage. People, and presumably pets, that eat such contaminated hamburger or gullet tissue can ingest doses of thyroid hormone sufficient to induce disease.**

Since none of the dogs in this report were being supplemented with L-thyroxine, the most likely cause of their high T4 concentrations and clinical signs of thyrotoxicosis was the feeding of a meat diet that had been contaminated with thyroid tissue. The fact that all dogs improved after stopping the diet is also in agreement with that premise.

The rationale behind the concept of BARF (an acronym for Biologically Appropriate Raw Food) is that this is the type of diets dogs were programmed to eat during their evolutionary development (6). Therefore, the BARF diet represents a biologically-appropriate food for dogs, rather than cooked or processed foods. With a BARF diet, the perfect meal would contain muscle meat, bone, fat, organ meats, vegetable and fruit materials combined in precisely the correct balance, just as nature intended.

In the dogs of this report, it is obvious that the correct balance was not maintained and a very large amount

of raw thyroid gland tissue ended up in their raw meat diet. As is the case with the exogenous L-T4, these natural thyroid hormones are not destroyed by gastric acid and can then be absorbed, leading to high concentration of circulating T4 and clinical sign of hyperthyroidism.

References:

1. Peterson ME, Ferguson DC: Thyroid diseases, In: Ettinger SJ (ed): Textbook of Veterinary Internal Medicine: Diseases of the Dog and Cat (Third Edition). Philadelphia, WB Saunders Co., 1989;1632-1675.
2. Peterson ME: Hyperthyroidism and thyroid tumor in dogs. In: Melian C, Perez Alenza MD, Peterson ME, Diaz M, Kooistra H (eds): Manual de Endocrinología en Pequeños Animales (Manual of Small Animal Endocrinology). Multimedia, Barcelona, Spain, 2008;113-125.
3. Hedberg CW, Fishbein DB, Janssen RS, et al. An outbreak of thyrotoxicosis caused by the consumption of bovine thyroid in ground beef. *New England Journal of Medicine* 1987;316:993-998.
4. Kinney JS, Hurwitz ES, Fishbein DB, et al. Community outbreak of thyrotoxicosis: epidemiology, immunogenetic characteristics, and long-term outcome. *American Journal of Medicine* 1988;84:10-18.
5. Köhler B, C. Stengel C, Neiger R. Dietary hyperthyroidism in dogs. *Journal of Small Animal Practice* 2012; 53, 182-184.
6. Billinghurst I. *The Barf Diet: Raw Feeding for Dogs and Cats using Evolutionary Principles*. 2001. W. Jean Dodds, DVM Hemopet / NutriScan 11561 Salinaz Avenue Garden Grove, CA 92843