



The Golden Retriever Club of America, Inc.

Hypothyroidism in Golden Retrievers

Ann F. Hubbs DVM, PhD

The thyroid gland is a small gland located near around the voice box, or larynx, in the neck. Hormones from the thyroid gland affect the rate of metabolism and temperature control, among other functions. Hypothyroidism, or low concentrations of thyroid hormones, is the most common endocrine disease of dogs, and breeders rate it as one of the most important health conditions of purebred dogs. While published data indicate a prevalence ranging from 1 in 156 dogs to 1 in 500 dogs (Schaer, 2000), it is much more common in some breeds, including Golden Retrievers. GRCA's first breed health survey indicated that over the course of their lives, approximately one in four of our members' Golden Retrievers develop hypothyroidism (Glickman et al., 1998-1999).

Signs and Symptoms

Dogs affected with hypothyroidism can show a number of signs associated with the decrease in thyroid hormones. The most severe cases exhibit a potentially fatal condition known as myxedema coma, with very low body temperature, severe metabolic and heart disturbances, and coma (Henik and Dixon, 2000). However, most cases of hypothyroidism are much more subtle, which can actually delay diagnosis because the signs can be similar to those of several other conditions. Affected dogs often gain weight, and in some cases, the coat may become thin and brittle. The tail is commonly affected and the thinning of tail feathers may replace a Golden Retriever's magnificent plume-like tail with an almost bald tail, a condition commonly called "rat tail". As the disease progresses, the skin tends to accumulate fluid, making it thick; and when the face is affected, dogs can develop a "tragic expression."

Behavior can also be affected. Body temperature may drop causing the dog to seek a warm place to lie down; and in many cases, hypothyroid dogs will be less active than usual. In addition, trainers have reported decreased trainability. In a few cases, dogs have developed sudden behavioral changes, such as becoming "grumpy." In some instances, when hypothyroidism was diagnosed and treated, behavior also improved (Beaver and Huag, 2003).

Dogs with hypothyroidism are also more likely to have other health conditions. Some of these are clearly caused by the lack of thyroid hormone while in other cases the relationship between the different conditions is not as clear (Panciera, 2001). For example, atherosclerosis, which is common in humans, is really pretty rare in dogs. Hypothyroidism changes that - a dog with atherosclerosis is extremely likely to be hypothyroid (Hess ET AL., 2003). Indeed, a high blood cholesterol concentration is one of the most common changes seen in the blood of hypothyroid dogs (Dixon et al., 1999).

Cause and Prevention

Most cases of canine hypothyroidism appear to be caused by infiltrating cells from the immune system -- lymphocytes that enter the thyroid gland in a condition called lymphocytic thyroiditis or autoimmune thyroiditis (Graham et al., 2001). In other cases, there is a loss of functional thyroid tissue for unknown reasons, a condition known as idiopathic thyroid atrophy (Gosselin et al., 1981). Rarely, hypothyroidism can result from a failure of the pituitary, the central gland controlling endocrine function. Inherited errors of metabolism are another rare cause of hypothyroidism (Chastaine et al, 1983; Fyfe et al, 2003). Short term studies indicate that several factors appear to potentially affect thyroid function in dogs, but it is still not clear, which, if any, of these factors, can cause long-term hypothyroidism. For example, while it is well established that many serious diseases of humans and dogs cause lowering of thyroid hormone levels, the thyroid function typically returns to normal once the underlying disease is controlled (deGroot, 1999; Nelson et al., 2001). This is called "nonthyroidal illness syndrome" or "euthyroid sick syndrome," and has no known relationship to the development of clinical hypothyroidism in dogs.

However, some recent studies suggest that certain environmental exposures and genetic predispositions can have a more direct effect on the thyroid gland. For example, at least one study indicates that vaccination increases antibodies against the thyroid hormone precursor, thyroglobulin, in dogs (Scott-Moncrieff et al., 2002). Obviously vaccination is essential for canine and public safety, but additional studies are needed to determine if over-vaccination can contribute to hypothyroidism in susceptible dogs. In addition, there is increasing evidence that neutered dogs and bitches are at increased risk for hypothyroidism (Panciera DL, 1994; Glickman et al., 1998-1999), as compared to intact animals.

In Beagles, the tendency to develop hypothyroidism is largely inherited (Benjamin et al., 1996). In Doberman Pinschers, a genetically-determined variant in one of the genes affecting the immune system (MHC class II), increases the risk of hypothyroidism (Kennedy et al., 2006). That particular high risk variant is not seen in Golden Retrievers, but the association between the genes of the immune system and hypothyroidism is incompletely investigated in Golden Retrievers. While we do not yet know definitive breeding schemes that are effective in preventing hypothyroidism, the genetic basis in several breeds suggests that the use of affected dogs should be minimized in breeding programs.

Diagnosis and Treatment

The diagnosis of hypothyroidism usually involves a panel of blood tests. Interpretation of these tests can really be quite complex and should be done by a veterinarian, sometimes in consultation with an endocrinologist. The Orthopedic Foundation for Animals issues certificates for dogs with normal thyroid function as determined by approved labs following thyroid testing procedures. (More information about these procedures is available online at <http://www.offa.org/thyproc.html>) However, test results represent only a specific moment in time, and hypothyroidism can develop months or years after a previous normal test. In addition, the AKC Canine Health Foundation is funding several ongoing research studies designed to improve the diagnosis of hypothyroidism. More information about these procedures is available

online.

Fortunately, most cases of canine hypothyroidism are easily treated, provided the diagnosis is made before the development of secondary conditions such as atherosclerosis. Treatment usually involves daily supplementation with levothyroxine (Soloxine) pills for the life of the dog (Schaer, 2000). Because there are potentially serious consequences to prolonged low or high levels of thyroid hormones, treatment for hypothyroidism should be done under veterinary supervision. The very good news though, is that almost all dogs with hypothyroidism can be successfully treated and remain as treasured companions for a full canine lifespan.

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