



Canine Compulsive Behavior: An Overview and Phenotypic Description of Tail Chasing in Bull Terriers

Alice Moon-Fanelli, PhD
Tufts University

Summary:

Recent estimates indicate that between six and fifteen million dogs and cats are euthanized each year in the United States at shelters alone, with less than five percent due to medical reasons. Studies investigating owner's reasons for placing their pets in shelters reveal that most pets are relinquished for behavioral problems. These statistics indicate an urgent need to educate owners and breeders on the necessity of providing a suitable environment for pets and appropriate management practices for breed specific proclivities to reduce anxiety. One of the most important hurdles is the need to inform breeders about breeding practices to prevent behavioral problems. In order to accomplish this goal, we need to provide concrete evidence that a number of behavior problems have a genetic basis.

Over five years ago, Dr. Nicholas Dodman and I joined forces to identify behavioral phenotypes and pursue the genetic bases of repetitive behavior patterns in dogs. Historically, repetitive behavior in animals has been considered little more than a motoric pattern that has become established in response to a suboptimal environment. Such dysfunctional behaviors displayed by animals have been categorized as stereotypes whereas similar patterns exhibited by humans have been referred to as compulsions. Recently, similarities in the clinical signs, development, and response to pharmacological treatment of repetitive behavior patterns in companion animals and humans have been recognized. This has led some researchers, including ourselves, to view animal "stereotypies" as potential models for the human psychiatric condition of obsessive compulsive disorder (OCD). Repetitive behaviors that have been considered as canine models of human OCD include acral lick dermatitis (ALD), light/shadow chasing, fly-snapping, flank sucking, and tail chasing.

Specific types of compulsive behavior are reported more frequently in certain breeds suggesting a genetic predisposition. For example, tail chasing occurs in a variety of breeds, but is most commonly observed in terrier and herding breeds particularly Bull Terriers and German Shepherds. Compulsive tail chasing in

dogs is a debilitating condition and many dogs have been euthanized for this behavioral disorder.

Tail chasing is the most common form of compulsive disorder expressed by Bull Terriers. Within our preliminary study population of 250 Bull Terriers, 86 had expressed some degree of tail chasing during their lives. This percentage (34 percent) is an overestimate for the entire breed population since the data were solicited from first degree relatives of affected dogs and affected dogs presenting at the Tufts University School of Veterinary Medicine behavior clinic. Nevertheless, the data suggest that tail chasing is represented in the gene pool to a marked degree since it is coming to phenotypic expression with a significant frequency within our study population.

Tail chasing is a repetitive behavior that is expressed as slow to rapid circling with the dog's attention directed toward its tail or rapid spinning in tight circles with no apparent focus on the tail. Within the same dog, these two forms of expression (slow, focused; rapid, unfocused) are typically expressed interchangeably. The development of tail chasing behavior differs among individuals varying from a sudden to a gradual onset. For some dogs, the onset of tail chasing behavior occurs suddenly with no apparent trigger. For other dogs, the onset is sudden but coincides with exposure to identifiable yet relatively benign psychological, physiological or environmental triggers that are interpreted as increasing anxiety. Other dogs show a gradual onset typically associated with identifiable eliciting parameters. These dogs show occasional, mild tail chasing that gradually escalates to daily bouts of tail chasing at clinical proportions. The onset of tail chasing typically occurs between 6-16 months of age, although it may present at any age. The range of age of onset we have observed is three months to ten years of age. Treatment of tail chasing consists of changes in management and pharmacological therapy. Serotonin re-uptake inhibitors (clomipramine, fluoxetine) used to treat people with OCD have been the most effective drug therapy for tail chasing in Bull Terriers.

Pedigree data for a large Bull Terrier family affected with tail chasing indicate the disorder has a heritable component in this breed. Two subsets of tail chasing behavior that differ in the degree (frequency, duration, and intensity) of expression in the Bull Terrier population have been observed. For genetic analyses, the degrees of manifestation have been separated into two threshold categories; clinical and sub-clinical. Review of the pedigree data indicates that "subclinical" tail chasers have produced clinically affected tail chasing offspring and vice versa. In addition, some sub-clinical tail chasers develop the full blown "clinical" tail chasing condition in response to changes in their environment. Based on the segregation of the phenotype within litters and between various matings, tail chasing is most likely transmitted as a polygenic disorder, possibly involving a small number of genes.

The American Kennel Club Canine Health Foundation has sponsored a study to collect blood samples from Bull Terrier families with compulsive tail chasing behavior. Our goal is to establish a DNA bank for subsequent research intended to identify genetic markers that are linked to the gene(s) for compulsive tail chasing in this breed. Dr. Elaine Ostrander and her team will conduct the molecular aspects of this work. Considering the robust nature of the phenotype, its familial basis, and the current status of the canine genome map, gene mapping studies constitute an appropriate approach towards reducing the frequency of occurrence of compulsive tail chasing in the Bull Terrier breed. Based on clinical experience the clinical signs, developmental expression and response to treatment show considerable conformity in the nature of tail chasing between breeds. Genetic information gleaned from this investigation could be beneficial for all breeds exhibiting tail chasing behavior and may be applicable to other forms of compulsive behavior as well. If genes are ultimately identified and the function of the gene(s) in other species is known, this may facilitate identifying the actual underlying physiological mechanism that has so far eluded researchers.

Dr. Moon-Fanelli's work is being supported by the following grant from the AKC Canine Health Foundation:

No. 1871: Bull Terrier Families Affected With Compulsive Tail Chasing Behavior: Behavioral Diagnosis, Pedigree Collection and DNA Isolation for Future Genetic Mapping Studies (Sponsored in part by the Bull Terrier Club of America Welfare Foundation)

Biographical Profile

Alice Moon-Fanelli, PhD, is a behavior geneticist and consultant on companion animal behavior at Tufts University School of Veterinary Medicine (TUSVM). She received her MS and PhD from the University of Connecticut in etiology and canine behavior genetics and completed a postdoctoral fellowship at TUSVM researching animal models of obsessive compulsive disorder. She is currently employed as a clinical assistant professor at TUSVM and is actively involved in research, behavior consultations and teaching. Her research efforts focus on the inheritance of behavioral disorders in companion animals, with a current emphasis on the inheritance of compulsive tail chasing in Bull Terriers.