



Research

Video analysis of dogs suffering from anxiety when left home alone and treated with clomipramine



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ABSTRACT

This study sought to film dogs with separation anxiety when left home alone while undergoing treatment with clomipramine and to compile objective information on behaviors exhibited. Twenty-three dogs ranging in age from 5 months to 9 years (mean, 3 ± 2 years) were included. The dogs were filmed when left home alone for variable periods ranging from 22 to 90 minutes after owner departure. Owners were required to film their dog on 5 occasions. Film 1 served to confirm a diagnosis of separation anxiety. Medication (clomipramine) was prescribed to all dogs. The owners were then asked to film the dogs on days 7, 14, 28, and 56 of the pharmacological treatment, but only 3 repetitions (days 0, 7, and 14) were used for statistical analysis. The initial dosage of clomipramine was 1 mg/kg twice daily for the first week and was then increased to 2 mg/kg twice daily. Any differences in behavior that occurred after clomipramine administration were evaluated using Friedman and Wilcoxon nonparametric tests. A significant beneficial effect of the dosage of 1 mg/kg every 12 hours of clomipramine in increasing passive behavior and reducing locomotion (pacing), scratching, and whining was demonstrated. A beneficial effect of 2 mg/kg every 12 hours in reducing vocalizations (barking and whining) and further increasing time spent in a passive state (resting or sleeping) was also shown. Some signs of separation anxiety may have improved as a consequence of the basic recommendations provided to the dog owners. This study not only confirms the importance of filming dogs home alone for the diagnosis of separation anxiety but also emphasizes the advantages of filming during the treatment of separation anxiety. Clinical effects can be seen as early as 1 week after starting the medication (clomipramine).

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Introduction

Undesirable behavior problems that occur during owner absence are published under various expressions, such as separation anxiety, separation-related problems, isolation anxiety, separation reactions, separation-related distress, and separation anxiety syndrome. Separation anxiety is defined as problematic behavior associated with anxiety that occurs exclusively in the owner's absence or virtual absence (Overall, 1997; Flannigan and Dodman, 2001; Appleby and Pluijmakers, 2003).

Dogs with separation anxiety often have other concurrent anxieties or phobia and show signs of anxiety even in other contexts.

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Dogs that are fearful may experience the fearful stimulus when left alone and engage in fear-motivated separation-related behaviors that might resemble separation anxiety (Horwitz, 2002). A diagnosis of anxiety when left alone can be made on the basis of a thorough behavioral history and medical evaluation to rule out medical and behavioral differential diagnoses (Sherman and Mills, 2008). The behavioral history is imperative to confirm the diagnosis of anxiety when alone and to rule out other behavioral differential diagnoses. Diagnosis is generally based on indirect evidence, such as elimination, salivation, or destruction during owner absence. Some behavioral signs, such as freezing, pacing, panting, restlessness, trembling, or body language compatible with anxiety (ears pulled back, repeated lip licking, repeated yawning, raised forepaw) can only be identified if a video-recorded film is done during owner absence (Lund and Jørgensen, 1999; Palestini et al., 2010a, b).

In the study by Palestini (2010a, b), films showed that dogs spent most of their time vocalizing and being oriented to the environment. Moreover, dogs also exhibited panting, passive

behavior, and destructive behavior (scratching at the cage, door, environment, and oral destruction of items or cage). No dog played during owner absence, 2 dogs trembled, and 3 dogs eliminated. In the same study, most dogs displayed signs such as vocalizing and/or destroying shortly after the owner's departure.

Two psychotropic medications, clomipramine (Clomicalm) and more recently fluoxetine (Reconcile), have been approved by the US Food and Drug Administration for the treatment of canine separation anxiety (Sherman and Mills, 2008). Clomipramine, a tricyclic antidepressant and potent inhibitor of serotonin reuptake, has been demonstrated to be effective in reducing stereotypic behavior in dogs (Overall, 1994; Hewson et al., 1998; Moon-Fanelli and Dodman, 1998; Overall, 1998a) and has been reported to be useful in the treatment of a number of other canine behavioral disorders, including aggression, anxieties (Frank, 2006), phobias, and separation anxiety (Overall, 1998b; Petit et al., 1999; Seksel and Lindemans, 2001; Lem, 2002; Crowell-Davis et al., 2003; Frank, 2005). To the authors' knowledge, no study has ever reported observations of filmed behaviors exhibited by dogs with anxiety when left alone during pharmacological treatment. The aim of this study was to compile additional objective information on change in behaviors exhibited by dogs suffering from anxiety when left alone during owner absence before and during pharmacological treatment (clomipramine).

Data collection was done by filming dogs with a diagnosis of anxiety when left home alone and by asking owners to complete a questionnaire to obtain direct and indirect evidences of the animal's behavior.

Materials and methods

Subjects

Twenty-three dogs (4 intact and 13 spayed females, 4 neutered and 2 intact males) ranging in age from 5 months to 9 years (mean, 3 ± 2 years) were included between spring 2008 and summer 2010. Dogs were recruited among patients presented for separation-related problems to 2 behavior clinics once the diagnosis of separation anxiety was confirmed by filming the dog's behavior home alone. Breeds included 1 cocker spaniel, 1 Rhodesian ridgeback, 1 Shetland sheepdog, 2 dachshunds, 1 Chihuahua, 2 poodles, 1 whippet, 1 miniature pinscher, 2 Boston terriers, 2 boxers, 1 border collie, 1 beagle, as well as 7 mixed breeds. Inclusion criteria stipulated that dogs were younger than 9 years and showed at least 2 signs of anxiety among those listed in Table 1 with the exception of vocalization and destruction. Vocalization for at least 15 minutes and destruction of exits were considered sufficient for inclusion as solitary signs. If included in the study, all dogs underwent a physical examination, complete blood cell count, and a biochemistry panel. Exclusion criteria included dogs older than 9 years and an absence of anxiety signs on video.

Dogs were also excluded if they were receiving psychoactive medications as well as had abnormal blood results or any medical condition precluding use of clomipramine. None of the owners were using pheromones in their home at the time of inclusion or during the course of the study. Concurrent treatment with nonpsychoactive medications or vaccination was not a cause for exclusion.

Data collection

The owners were asked to fill out a multiple-choice questionnaire including information on the dog's characteristics and history as well as on the physical and social environments of the dog. Questions touched on home environment, management, age (current and age at acquisition), sex, reproductive status (entire or

Table 1

List of signs compatible with separation anxiety (inclusion criteria)

Panting
Vocalization for more than 15 minutes if is the only sign ^a
Urination/defecation
Salivation
Gastrointestinal signs: vomiting, diarrhea
Destruction of the "exits": scratching or chewing at barriers/escaping/jumping through windows ^a
Restlessness/increased motor activity
Hiding/trembling/jimmobility
Self-trauma/licking behavior
Body language (ears back, tail down, raised forelimb, etc.)

^a Only 1 sign necessary for inclusion in the study in the case of vocalization for more than 15 minutes or destruction of the exits.

neutered/spayed), breed, number of adults and children in the household (children older than 18 years were considered adults), source of dog (breeder, pet store, shelter, rescue, family, friends, or stray), and number of dogs and cats in the household. Questions about the presence of the dog's anxiety-related behavior during owner absence (i.e., house soiling, destruction, and vocalization) and owner expectation were also compiled. Finally, questions about signs compatible with fear or anxiety presented by the dog during thunderstorms, fireworks, day to day in the home environment as well as during predeparture or owner return were compiled.

A video camera was installed in the room in which the dog usually stayed during owner absence. If the dog was allowed to roam freely, the camera was installed where the dog was believed to spend most of its time. The owners were asked to start the camera immediately before their departure from home. The dogs were filmed when left home alone for variable periods ranging from 22 to 90 minutes depending on the owner's schedule.

Dogs were filmed under routine conditions normally adopted by the owners. Fifteen dogs were allowed to run freely in the home, and 8 dogs were kept in a cage.

Owners were required to film their dog on 5 occasions. Film 1 served to confirm a diagnosis of anxiety when home alone. The remaining 4 films were taken on days 7, 14, 28, and 56 of the pharmacological treatment. The initial dosage of clomipramine was 1 mg/kg twice daily for the first week and was then increased to 2 mg/kg twice daily. If there was insufficient clinical improvement by day 28 (vocalization persisting for more than 15 minutes), dosage was increased to 3 mg/kg twice daily. Only 3 repetitions of videos (days 0, 7, 14) were analyzed because several dogs ($n = 5$) were not filmed after the third video and 3 needed an increased dosage of 3 mg/kg.

For treatment to be successful, it is essential to stay within the owner's range of possibilities both in terms of time and commitment load, thus it must not require overly strict or unnatural rules for the owner–animal relationship (Palestrini, 2009). Behavior modification was limited to clarifying owner–animal communication by teaching the client to correctly read their pet's body language (recognize signs compatible with anxiety), by asking the dog to sit before every interaction (e.g., for food, play, attention, putting on the leash, removing the leash, going out, or coming in, etc.) and by rewarding desirable behavior rather than focusing on correcting undesirable ones. Owners were therefore asked to reward desirable behavior offered spontaneously by the dog and were told to have the dog sit before any interaction with them, not as an obedience exercise but rather as a method to teach the dog an appropriate way to ask for something. The dog also learned that sitting was always followed by neutral or positive consequences, such as food, water, play, attention, or walks. Over time, saying "sit" would become a way for the owners to communicate to the dog that everything is fine. Owners were instructed that undesirable behaviors were either ignored, pre-empted, or interrupted and followed with clear

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