A case of Sensory Deprivation Syndrome in a mongrel dog

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Abstract: A mongrel dog, 6-year-old, 17 kg neutered female, was evaluated for fearful behavior when exposed to unfamiliar people and dogs as well as novel environments. Vocalization and urination in owner absence were also reported. Throughout the physical examination, the patient appeared extremely frightened, with tail tucked between its hind legs and ears held back. No signs of aggression were shown. Freezing was its only response to fear. Many symptoms and signs observed in the patient can be included in the Sensory Deprivation Syndrome (SDS) diagnosis. Initially, the owner refused the proposed pharmacological treatment; therefore, a sole behavioral treatment, aimed to enhance the dog perception of her own domestic environment, was implemented. A nose-work based program was initiated, inside the house, in order to enhance the patient self-esteem and its perception of the home environment. Relaxation exercises were also performed to reinforce the dog's calm behavior. In addition, Adaptil® diffuser was installed by the doghouse. Counter-conditioning towards people entering the house was also performed. A pharmacological therapy was also added. Selegiline hydrochloride was administered at the dosage of 0.58 mg/kg. Pharmacological administration was suspended after 2 months due to owner's personal reasons (owner and dog moved to another country). After 11 weeks from the beginning of the behavioral therapy the dog appeared very calm, when inside the house, and able to manage stressful stimuli such as unfamiliar people. Starting from the third week after the first administration of Selegiline, weekly sessions with tutor dogs were added to the therapy. At the time of the second session the patient exploratory behavior was greatly improved and she would actively initiate social interactions with tutor dogs.

Key Words: dog, phobia, Sensory Deprivation Syndrome, selegiline.

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Presentation

The dog was evaluated for fearful behavior when exposed to unfamiliar people and dogs as well as novel environments. Vocalization and urination in owner absence were also reported.

The patient was a 6-year-old 17 kg neutered female mongrel.

History and presenting signs

Unfortunately, the patient's history lacks much information. The subject was adopted at around 6 years of age from a rescue shelter in Rome. Volunteers told the new owner the dog had spent the last 2 years at the shelter. She was rescued and seized along with 38 other dogs that were kept in an about 60 sq meter apartment with no outdoor space. According to what the volunteers stated the dog was born inside the apartment and had been living there for 4 years. No further information on her behavior during its stay at the house is available.

At the shelter, she was housed in a kennel alongside with a medium-size female mongrel that she

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already knew. Signs of fear (avoidance behavior, ears held back, tail tucked between legs, increased motor activity, panting) were noticed by the volunteers from the shelter when new people and dogs approached. Since the first encounter the dog showed no sign of fear towards the new owner who remained the only person capable of approaching and touching her without triggering heavy fear responses. At the time of the initial behavioral evaluation, the dog had been living with her new owner for 6 months. She appeared calm when inside the house and when alone with her owner, although she would get startled by sudden movements and close sounds. When visitors entered the house the dog would back up, woof and avoid physical contact. Outside the house, she would show increasing signs of fear (panting, startling to sudden stimuli, escape attempts) when approached by unfamiliar people or dogs and signs of anxiety (hypervigilance, hypermotility, constant whining, pacing, yawning, inhibited exploratory behavior, diarrhea). The dog was usually left alone for 8 to 10 hours a day during working days. The owner reported vocalization and urination in her absence during working hours, and vocalization solely after she closed the dog outside the bedroom door at night.

Physical and laboratory evaluation

Throughout the physical examination, the patient appeared extremely frightened with tail tucked between her hind legs and ears held back. No signs of aggression were shown. Freezing was her only response to fear. As expected, no interest in treats was shown neither during the examination nor afterwards. CBC results reported no altered values. Serum biochemical analyses resulted in a slight increase in CPK (165 IU/L, range 45-155 IU/L) and ALT (66 IU/L, range 10-60 IU/L) liver enzymes and colinesterasis (8706 IU/L, range 3350-6550 IU/L). Urine analysis was unremarkable. Values from measurement of total T4 (thyroxine) were within normal ranges. No parasites in the feces were found.

Diagnosis

Signs such as panting, pacing, barking, ears held back, tail tucked between legs, dilated pupils, avoidance behavior, and emotional anticipation showed by the patient in presence, or even probable presence, of other dogs led to the diagnosis of phobia of unfamiliar dogs. When exposed to unfamiliar people, signs of fear were less intense and only ears back, tail back and avoidance behavior were observable. Therefore, a diagnosis of fear of unfamiliar people was made.

On the other hand, since the patient's fear response towards environmental stimuli was excessive and abnormal, with no clear attempts of removing or moving away from the fearful stimulus, again, a diagnosis of phobia of environmental stimuli was made (Rogerson, 1997). Increased motor activity, hypervigilance, constant whining and frequent displacement behaviors when outside the house were considered signs of anxiety (Overall, 1997; Landsberg et al., 2013). Results from medical examinations ruled out chronic pain as cause for avoidance behavior and metabolic diseases as cause of anxiety and fearful behavior.

In the French classification of behavioral disorders, many symptoms and signs observed in the patient can be included in the Sensory Deprivation Syndrome (SDS) diagnosis (Mège, 2003). Phobic responses to identifiable stimuli and strong tendency to anticipation are described among the SDS stage 1 diagnosis criteria. On the other hand, inhibited exploratory behavior with static exploration and expectation postures are almost pathognomonic postural signs of SDS stage 2 (Landsberg et al., 2013). Regardless the type of classification used, intra-specific hyperstimulation and the impossibility to avoid and retreat from negative social interactions during socialization period were most likely the cause of the patient's attitude towards conspecifics. On the opposite, an inadequate socialization with humans may be identified as the primary cause for its fearful behavior when

approached by unfamiliar people. Separation anxiety caused by hyperattachment was also included in the diagnoses, as vocalization and urination occurred in owner absence (Sherman & Mills, 2008). Differential diagnoses with other types of separation anxiety were considered, but ruled out after assessing the condition of symptom appearance.

Treatment

Initially, the owner refused the proposed pharmacological treatment; therefore, a sole behavioral treatment aimed to enhance the dog perception of her own domestic environment was implemented. The final purpose was to improve the patient overall quality of life and create a safe place were further behavior modification techniques could be started. A nose-work based program was initiated inside the house to enhance the patient self-esteem and its perception of the home environment. During this phase the owner was instructed to provide the dog with free access to a doghouse purposely bought and placed in a corner of the living room (in substitution of a dog basket that the dog did not often use) and associate it with positive stimuli by means of classical conditioning. Relaxation exercises were also performed to reinforce the dog's calm behavior by rewarding her every time she lay down, sat, or rested inside the doghouse and anywhere around the house (Sherman, 2008). In addition, Adaptil® diffuser was installed by the doghouse (Gaultier et al., 2005; Kim et al., 2010). To reduce exposure to frightening stimuli the owner was instructed not to walk the dog outside during rush hours or in crowded places but exclusively around the area nearby her house where the possibility to encounter other people and dogs was lower and urban stimuli further. Furthermore, she was instructed not to force the dog to stay close to unfamiliar people inside the house and let her freely choose to pull back to the doghouse.

Counter-conditioning towards people entering the house was also performed. The owner was asked to place a basket full of palatable treats outside the door and advise guests to drop some treats on the floor as soon as they stepped into the house. No other attempts to interact with the dog had to be made. At a later time, exercises to focus the dog attention towards the owner were first performed inside the house, then on the terrace and finally outside. Nose-work games were also brought outdoor. The owner was also instructed how to desensitize and counter-condition her dog perception of unfamiliar people and dogs (Haug, 2008) during routine walks, by using treats and praises. Simultaneously, weekly sessions with tutor dogs were carried out. At this stage a pharmacological therapy was also added. Selegiline hydrochloride was administered at the dosage of 0.58 mg/kg (Cromwell-Davis & Murray, 2008). Pharmacological administration was suspended after 2 months due to owner's personal reasons (owner and dog moved to another country).

Follow-up

After 4 weeks from the behavioral evaluation the owner reported that dog went to the doghouse without verbal cues, both when she was busy at doing housework and in presence of visitors. Furthermore, she noticed that since the last week the dog started to retire before she closed the bedroom door to go to sleep, in contrast with what she used to do before: she used to wait for the bedroom door to be closed, whine for a few minutes and then retreat to the doghouse. Lastly, the dog seemed to stop vocalizing and urinating in owner absence. On the other hand, she started to show excitement urination when the owner returned from work (Overall, 1997). Since the problem of excitement urination might have been exacerbated by the long period of time (8 to 10 hours) spent by the dog alone in the house without being able to satisfy her physiological needs, the owner was instructed to work on self-control exercises (a simple "sit" verbal cue in progressively arousing situations), reducing greeting rituals and quickly take her for a walk. Specifically, before each walk outside,

she was asked to put the dog to sit in front of the door to put on the harness. Hence, she was asked to repeat the exercise as soon as she entered the house and then take the dog outside. Since the first phase of therapy was focused on reducing exposure to frightening stimuli, counter-conditioning towards unfamiliar people and dogs outside was performed with a very low frequency and no improvements in the dog behavior were reported.

After 6 weeks from the behavioral evaluation the dog did not have excitement urination problems anymore and also the owner did not have to take her out immediately after she entered the house. A slight improvement in the dog attitude towards people and dogs outside was noticed (she would sometimes ignore them), although it was neither constant nor satisfying: she would still bark, panting, pacing and pull on the leash most of the times she spotted another dog.

After 11 weeks from the beginning of the behavioral therapy the dog appeared very calm when inside the house and able to manage stressful stimuli such as unfamiliar people. The owner noticed an increasing interest in the latter (she would get close and sniff them), even though she would still retreat from being touched or petted. Further improvements were also reported as for her behavior towards dogs and unfamiliar people outside the house. However, since they were not satisfying, the owner accepted to begin a pharmacological therapy. Selegiline was administered daily at a dosage equal to 0.58 mg/kg/die, mainly to reduce the patient's fear-induced behavioral inhibition (Landsberg et al., 2013). Two weeks after the beginning of the drug therapy no difference in the rate of improvement was noticed. Starting from the third week after the first administration of Selegiline, weekly sessions with tutor dogs were added to the therapy. At the time of the second session the patient exploratory behavior was greatly improved and it would actively initiate social interactions with tutor dogs. To facilitate the positive evolution of the patient behavior, tutor dogs with increasingly extrovert personalities were used as the therapy progressed.

At the time of the fifth and last session the dog could normally interact, and even roughly play, with tutor dogs, with some dogs she used to meet at the dog park and with the dogs of the dog-sitter she was left with twice during this time. However, she would still show signs of fear when exuberant unfamiliar dogs approached. This is the reason why the owner was instructed to carefully select those dogs to possibly approach. Although the drug administration was interrupted earlier than expected (the owner and her dog moved to another country) six months after the end of the therapy signs of anxiety such as hypervigilance, pacing, panting and whining when exposed to novel environments had drastically decreased. Patient's resilience after the exposure to stressful stimuli was greatly improved. Fear of unfamiliar people had also decreased to the level that she would let itself be touched and petted by anyone who approached in the correct manner (Ricci & Carlone, 2016). Its attitude towards unfamiliar dogs neither improved nor worsened since the end of the therapy.

Discussion

Both the anamnesis and the behavioral evaluation supported the diagnosis of fear of unfamiliar people, phobia of unfamiliar dogs, phobia of environmental stimuli, anxiety and separation anxiety. Although, there is not one common definition of the terms "fear" and "phobia" in veterinary literature, fear behavior has been considered here as an adaptive response towards a specific stimulus perceived as an actual or potential danger. On the contrary, phobia is referred to as a fear response which is extreme, long-lasting and /or elicited by low level of stimulus (Blackwell et al., 2013), and non-adaptive. Therefore, fear and phobia are here differentiated only by their impact on the subject's quality of life, in contrast with the human psychiatric classification where phobia is also defined as an "irrational fear". However, this definition based on a "rationality/irrationality" model of fears and phobias cannot be transferred to veterinary medicine as the validity of the fear response is difficult to assess in dogs, as the same stimulus is perceived differently by different species. Anxiety, or anxious state, as described by Mège et al. (2003), is a pathological condition

found in several behavioral disorders. Nevertheless, Overall (1997) stresses the need of limiting a diagnosis of anxiety to a specific condition, which, as in this case, is characterized by persistent autonomous nervous system hyperreactivity, increased motor activity and hypervigilance that interfere with normal social interactions. The patient history also led to the diagnosis of separation anxiety, but surprisingly did not show any signs of fear of thunderstorm or other loud noises, which often co-occur with this diagnosis (Overall et al., 1997). Absence of signs of fear of loud noises or storm phobia excluded the patient from sub-class C of separation classification proposed by Sherman (2008). Its anamnesis revealed behaviors compatible with hyperattachment or sub-class B separation-related disorder diagnosis.

Italian owners often are worried using psychotropic drugs on their pets. In this specific case, since the owner initially refused to administer the recommended drug, a behavioral therapy alone was prescribed. This option was considered feasible thanks to the fact that the patient appeared calmer in her domestic environment. This condition rendered the first part of the behavioral therapy very effective and prepared the ground for its successive phases. However, after 11 weeks from the beginning of the behavioral therapy, as improvements with fear behavior towards unfamiliar people and dogs outdoor were inconsistent, the owner accepted to use the prescribed drug.

Several drugs have been used to treat fears, phobias and anxiety in dogs. In this specific case, Selegiline hydrochloride was chosen for its action on the dopaminergic system (Mills & Ledger, 2001). Indeed, symptoms and signs ascribable to a dopaminergic dysfunction, such as pacing, diarrhea, increased motor activity, hypervigilance, emotional anticipation, were the more evident and intense among those displayed by the patient. Selegiline has also been proposed for the treatment of fearful dogs, especially those showing a high degree of behavioral inhibition (Landsberg et al., 2013). Indeed, Selegiline was very effective at making exploratory as well as play behavior emerge. Fortunately, although both behavioral and pharmacological therapy had to be unexpectedly interrupted due to motivations unrelated to the medical case, the rehabilitation process was sufficiently strengthened not to determine symptom flare-ups.

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Un caso di sindrome da privazione sensoriale in un cane meticcio

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Sintesi

Un cane meticcio, femmina, dell'età di 6 anni e del peso di 17 kg è stato portato alla consulenza comportamentale in quanto pauroso quando esposto a persone e cani sconosciuti e in un ambiente nuovo. Il cane vocalizzava ed eliminava in modo inappropriato in assenza del proprietario. Durante la consulenza il cane era estremamente spaventato, con la coda in mezzo alle zampe posteriori e le orecchie abbassate, senza mostrare segni di aggressività ma solo di freezing. Molti dei sintomi e comportamenti osservati erano riconducibili alla Sindrome da Privazione Sensoriale (SDS). Il proprietario inizialmente rifiutò un trattamento farmacologico e perciò fu intrapreso il solo trattamento comportamentale per migliorare la percezione dell'ambiente domestico da parte dell'animale.

Fu consigliato inoltre di compiere con il cane esercizi di ricerca olfattiva, per aumentare la sua autostima e per migliorare, in modo positivo, la conoscenza dell'ambiente, oltre a esercizi di rilassamento per rinforzare i comportamenti di calma del cane. Inoltre fu consigliato di collocare i feromoni di appagamento (Adaptil®) attraverso un diffusore ambientale e di effettuare un programma di controcondizionamento nei confronti degli estranei che entravano in casa.

Dopo una resistenza iniziale, il proprietario accettò di sottoporre l'animale ad una terapia farmacologica con Selegilina (0,58 mg/kg/die) che fu sospesa dopo due mesi poiché il proprietario si trasferì con il cane in un'altra nazione.

Dopo 11 settimane dall'inizio della terapia comportamentale il cane era molto più tranquillo all'interno dell'abitazione ed in grado di sopportare stimoli precedentemente stressogeni come le persone sconosciute.

Dalla terza settimana seguente l'inizio della somministrazione della Selegilina, il cane fu sottoposto ad incontri con cani tutor. Dopo la seconda sessione di incontri, il cane mostrò un notevole incremento del comportamento esplorativo ed inizio attivamente le interazioni sociali con il cane tutor.

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