

HYPERAROUSAL BEHAVIOR IN DOGS

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INTRODUCTION

- Hypersensitivity-Hyperactivity (HSHA) syndrome
 - HSHA named by Pageat in 1998
 - Described as being associated with impulsive, restless, hyperactive/hyperkinetic and inattentive behaviors in dogs (Landsberg, 1997; Overall, 2013; Wright, 2012)
 - Potentially a spontaneous animal model of human ADHD (Lit, 2010; Puurunen, 2016)
 - May be considered as a clinically defined canine version of ADHD
- Owner-based questionnaires measuring attention skills and activity/impulsivity in dogs (Vas et al., 2007; Wright et al., 2011).
- High arousal behaviors may be comorbid with anxiety and aggression in dogs (30%)



INTRODUCTION



Attention-deficit/hyperactivity disorder (ADHD) is an often lifelong and prevalent neurodevelopmental disorder in humans



Behaviors are characterized by developmentally inappropriate inattention, hyperactivity and impulsivity symptoms as well as functional impairment in the academic, occupational, and social domains.



Inattention is defined by a relatively low ability to sustain concentration in tasks, distractibility, forgetfulness, disorganization, avoiding tasks that require sustained effort

INTRODUCTION



Hyperactivity is characterized by an excessive increase in motor activity, often manifesting as persistent restlessness, fidgeting, and difficulty in maintaining stillness.



Impulsivity is characterized by a tendency to act on immediate urges or stimuli without sufficient forethought and conscious judgement compared to individuals with similar levels of knowledge and ability.



It encompasses behaviors marked by a failure of motor inhibition (impulsive action), intolerance of delay to rewards (impulsive choice) in the context of decision-making.



INTRODUCTION

- Domestic dogs are a promising animal model of neurological disorders including autism, Alzheimer's disease and ADHD-like behavior.
- Proposed definition of HSHA covers three main symptoms: hyperactivity, lack of satiety, and shorter sleep duration with normal cycles.
- Although HSHA is often reported by veterinarians as an “ADHD-like syndrome” in dogs or “canine ADHD”, it remains uncertain whether HSHA is a distinct or related condition compared to “ADHD” in dogs (if ADHD exists).

INTRODUCTION

- Several questionnaires have been developed to assess ADHD-related characteristics in dogs with an extended and revised version of the Dog ADHD Rating Scale—Dog ARS32*

*Csibra B, Bunford N, Gácsi M. Evaluating ADHD assessment for dogs: A replication study. *Animals*. 2022;12:807

*Vas J, Topál J, Péch É, Miklósi Á. Measuring attention deficit and activity in dogs: A new application and validation of a human ADHD questionnaire. *Appl. Anim. Behav. Sci.* 2007;103:105–117.

Appendix I

Dog-ADHD RS Owner version questionnaire for attention deficit and activity-impulsivity

Please sign how often the statement is true for your dog!
(If you find it necessary you may add short notes to the items)

Name of owner:

Name and gender of dog:

Date of birth of the dog (year, month):

Breed of dog:

Date:

Items:

Never Sometimes Often Very often

1. Your dog has a difficult time learning, because it is careless or other things can easily attract it's attention.	0	1	2	3
2. It's easy to attract it's attention, but it loses its interest soon.	0	1	2	3
3. It's difficult for it to concentrate on a task or play.	0	1	2	3
4. It leaves from it's place when it should stay.	0	1	2	3
5. It can not be quiet, it can not be easily calmed.	0	1	2	3
6. It fidgets all the time.	0	1	2	3
7. It seems that it doesn't listen even if it knows that someone is speaking to it.	0	1	2	3
8. It is excessive, difficult to control, if it lunges it is hard to hold back.	0	1	2	3
9. It would always play and run.	0	1	2	3
10. It solves simple tasks easily, but it often has difficulties with complicate tasks, even if it knows them and has practiced them often.	0	1	2	3
11. It is likely to react hastily and that's why it is failing tasks.	0	1	2	3
12. It's attention can be easily distracted.	0	1	2	3
13. It can not wait as in it has no self-control.	0	1	2	3

Training qualification the dog has had:

(Please indicate whether the dog passed an exam or just participated in training)

obedience
trained at home

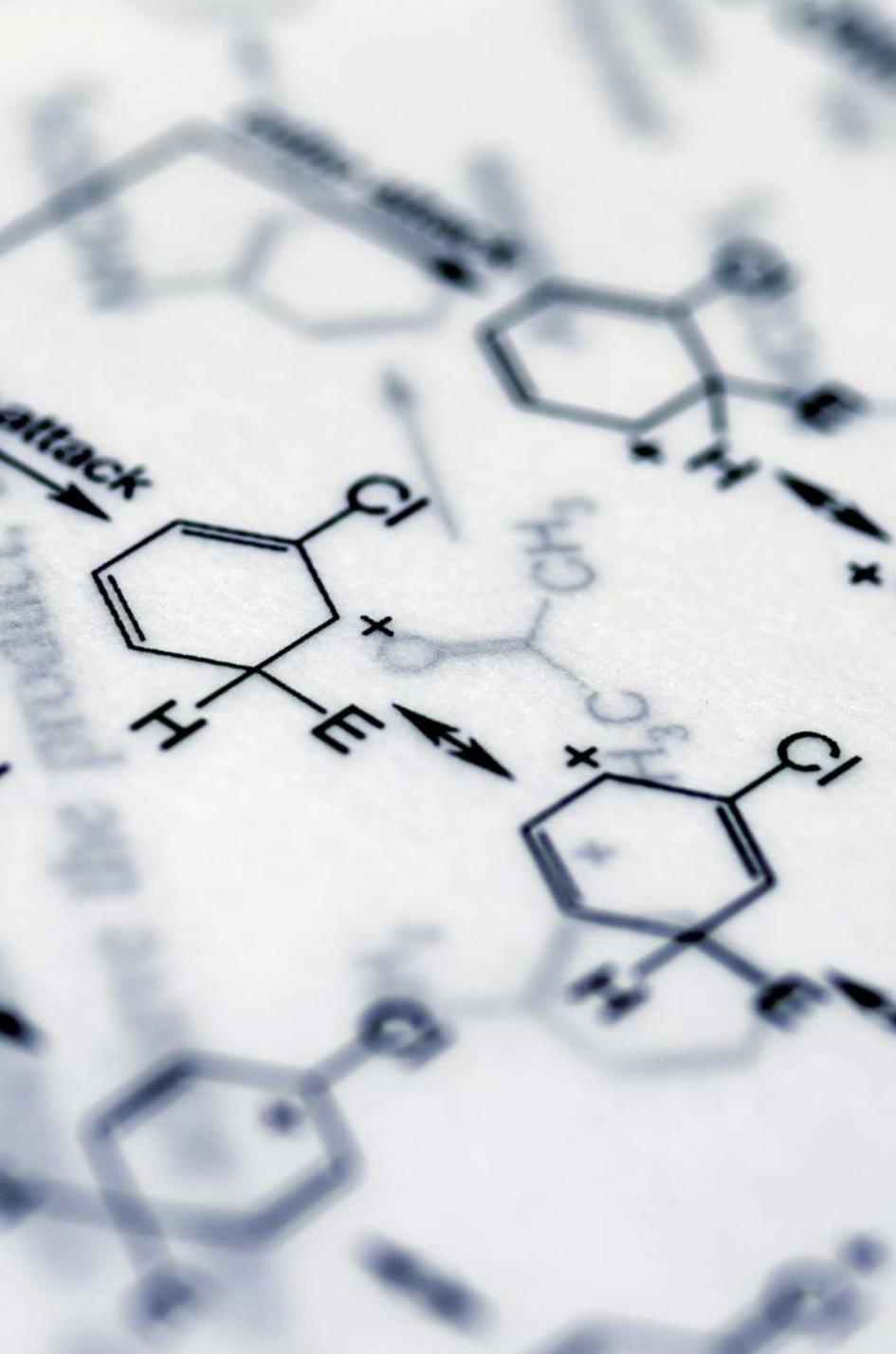
Schutzhund
no training

agility
something else, like:.....

hunting

BACKGROUND

- Methylphenidate was the first-choice treatment for ADHD in humans, research initially focused on dopamine receptors
- Psychostimulant calming effect in dopamine transporter knock-out mice mediated by the serotonergic system (Gainetdinov et al., 1999)
- More results using rodent models provided strong evidence to support the importance of serotonin in behavioral impulse control (Fonseca et al., 2015)
- ADHD pathophysiology is complex, and many neurotransmitters are likely involved



BACKGROUND



Methylphenidate is thought to block the reuptake of norepinephrine and dopamine into the presynaptic neuron and increase the release of these monoamines into the extraneuronal space.



Methylphenidate reported as possible treatment of HSHA in dogs (Piturru, 2014)

Methylphenidate is a Schedule 2 drug

Lacks consistency in clinical response; sometimes associated with increased agitation and hyperarousal in dogs (Sackman clinical observation)



Serotonergic involvement in hyperactivity /impulsivity behavior control would indicate that an SSRI may be effective



Fluoxetine reported to be helpful in HSHA dogs (Masson, 2018; Bleuer-Elsner, 2021)



BACKGROUND

- Pharmacological management of attention-deficit hyperactivity disorder (ADHD) has expanded beyond stimulant medications to include alpha 2 adrenergic agonists
- Norepinephrine serves multiple brain functions, including arousal, attention, mood, learning, memory and stress response
- Alpha-2 adrenergic drugs activate pre-synaptic autoreceptors that dampen adrenergic tone
- Clonidine , through down-regulation of NE release from the locus ceruleus, has been helpful in management of ADHD symptoms, as well as other neuropsychiatric symptoms such as motor and vocal tics, aggression, opiate withdrawal, and insomnia



PURPOSE

- Evaluate the benefit and untoward effects of the use of clonidine in combination with SSRIs in treating dogs who present with high arousal behaviors

METHODOLOGY



Clinical data were evaluated from the medical and behavior records of a Dipl ACVB (Sackman) and from records of a CPDT-KA trainer whose practice focuses on behavior problems in companion dogs (Gavin)



Data was collected from the electronic medical records of dogs treated between March 1, 2021, to March 30, 2022



Behaviors consistent with HSHA were identified by the Dipl ACVB (Sackman) and/or trainer (Gavin) in consultation with the veterinary behaviorist using consistent criteria

METHODOLOGY



All dogs were given behavior modification and safety plans in addition to medication and had at least one follow-up examination within 6 months of the initial treatment date



Behavioral medications were prescribed by Dr. Sackman or referring veterinarians



Drug(s) prescribed, compliance to administration, change in behavior and any untoward effects were collected for all dogs

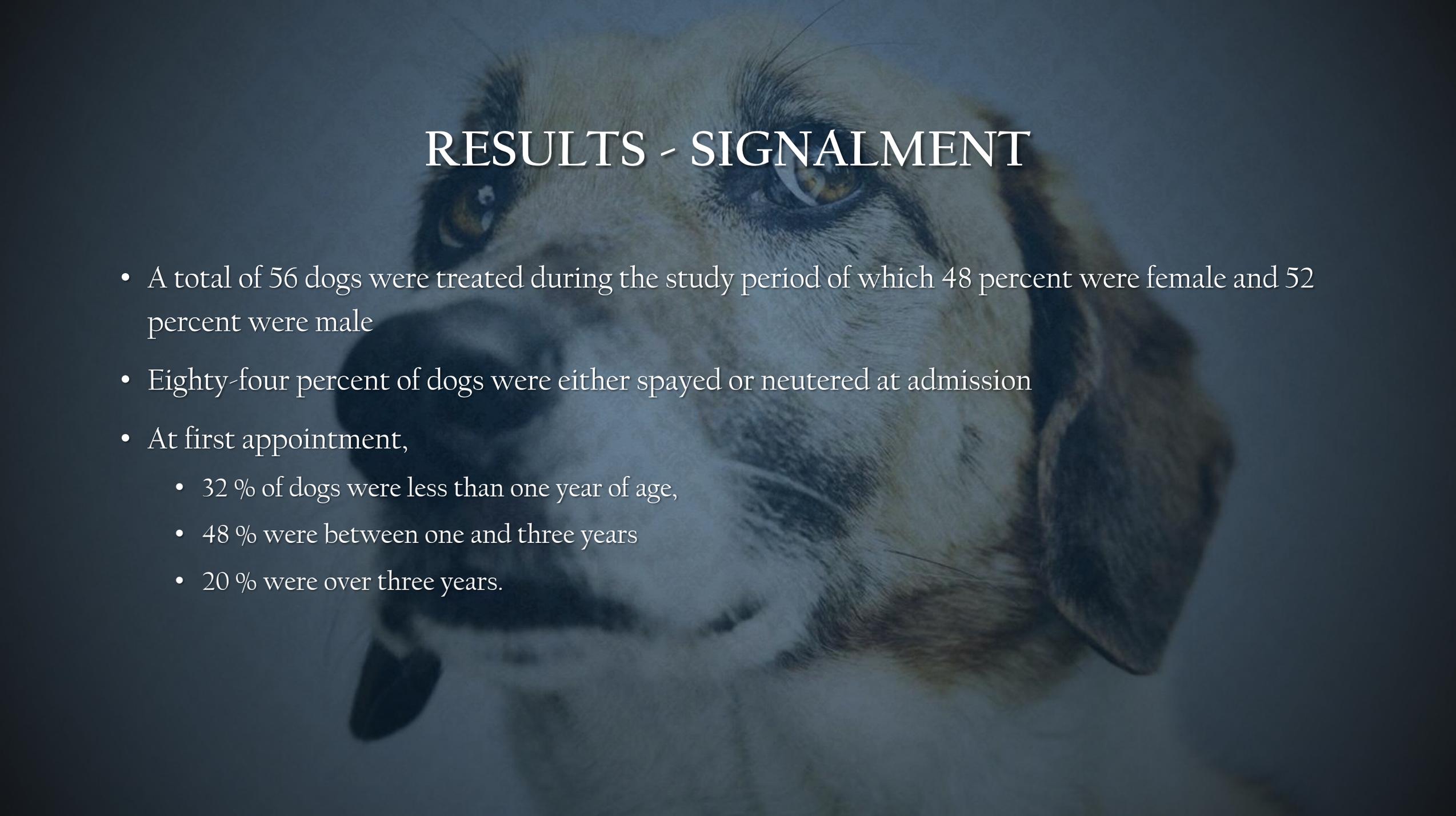
Example of replacement behavior training



Example of Zen hands with a child



Notice in this example, I start with classical conditioning, marking and treating for even noticing a stationary child. We often use gates for protective contact as well.



RESULTS - SIGNALMENT

- A total of 56 dogs were treated during the study period of which 48 percent were female and 52 percent were male
- Eighty-four percent of dogs were either spayed or neutered at admission
- At first appointment,
 - 32 % of dogs were less than one year of age,
 - 48 % were between one and three years
 - 20 % were over three years.

RESULTS - BEHAVIORS

- Primary behavioral problems the dogs presented for was consistent with high arousal including:
 - 1) Jumping and grabbing hands and arms with hard biting (biting with bruising and breaking the skin and biting and holding);
 - 2) Grabbing and tearing clothing;
 - 3) Jumping, lunging and barking, and knocking people over all with limited environmental stimulation;
 - 4) Difficulty sleeping and resting (seemed in perpetual motion);
 - 5) Some, but not all had lack of satiety

RESULTS - BEHAVIORS

- Behaviors were recognized in all dogs starting at or under four months of age.
- Comorbid behaviors included 50 % with fear-based anxiety and aggression, 41 % resource guarding aggression, 27 % territorial aggression, 18 % conflict aggression and under 10 % noise phobia, separation anxiety, generalized anxiety and compulsive behaviors.



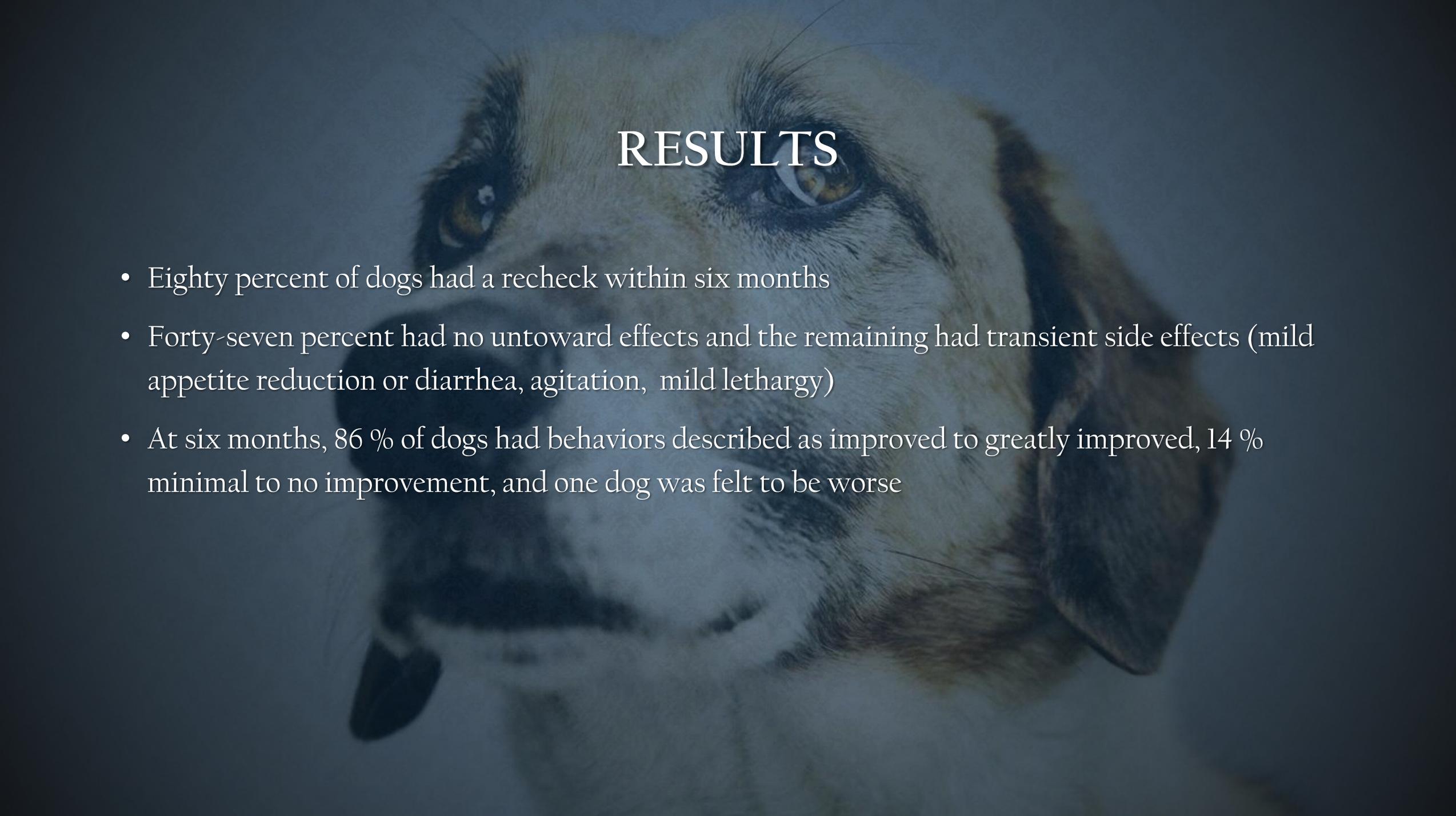


PURPOSE

- Evaluate the benefit and untoward effects of the use of clonidine in combination with SSRIs in treating dogs who present with high arousal behaviors

RESULTS - MEDICATIONS

- At presentation 45 % of dogs had not been on any behavioral medication, 11 % had been on fluoxetine alone, 13 % trazodone alone; the remaining dogs were on a combination of SSRIs with and without trazodone and other supplements
- Less than 5 % of dogs had been on a variety of nonprescription products
- After admission 13 % of dogs were started on fluoxetine alone, 55 % on fluoxetine and clonidine together and the remaining patients were started on clonidine in addition to another SSRI
 - Fluoxetine dose ranged between 1 mg/kg daily to 1.5 mg/kg daily
 - Clonidine dose ranged between 0.015 mg/kg – 0.03 mg/kg q 6-8 hours
 - To evaluate response to SSRI alone only dogs with significant hard grabbing and biting were started on clonidine and SSRI at the first visit



RESULTS

- Eighty percent of dogs had a recheck within six months
- Forty-seven percent had no untoward effects and the remaining had transient side effects (mild appetite reduction or diarrhea, agitation, mild lethargy)
- At six months, 86 % of dogs had behaviors described as improved to greatly improved, 14 % minimal to no improvement, and one dog was felt to be worse



CONCLUSIONS

- Preliminary results indicate SSRIs and clonidine is highly effective for treating high arousal behaviors and have minimal untoward effects
- Most clients noticed a significant improvement allowing the dog to stay successfully in the home

ANY QUESTIONS?

