Stress in aggressive dogs towards people: behavioral analysis during consultation

Angelo Gazzano[1,*], Silvia Migoni[2], Giovanna Guardini[2], Jon Bowen[3], Jaume Fatjò[4], Chiara Mariti[1]

[1] *Dipartimento di Scienze Veterinarie, Università di Pisa - Italy*
[2] *External collaborator*
[3] *Royal Veterinary College, North Mymms - UK*
[4] *Chair of Affinity Foundation Animals and Health, Department of Psychiatry and Forensic Medicine, Universitat Autònoma de Barcelona - Spain*

Abstract: Canine aggression, especially directed toward people, is one of the most severe behavioral problem referred to specialist clinics. The aim of this study was to analyze the behavior of aggressive dogs toward people in the clinic and to compare it with the behavior of dogs affected by other behavioral disorders. For the present study 26 cases were analyzed, divided into 2 groups: the aggression group (AG) consisted of 13 dogs with aggression toward people and the non-aggression group (NAG) included 13 subjects with behavioral problems other than aggression toward people. The AG group was further divided into dogs that were aggressive toward strangers (AGS; n=6), and dogs that were aggressive toward familiar people (AGF; n=7). All dogs were subjected to a behavioral consultation; the first consultation of each dog was videoed and then analyzed to measure the duration (in seconds) of social and non-social behaviors. Three focal periods of each video, totaling thirty minutes, were examined: T1 recorded minutes 0 to 10, T2 from 25' to 35', and T3 from 50' to 60'. Comparing these three periods, a statistically significant difference was found only for exploratory behavior; for both AG (χ^2=14.00; p=0.001) and NAG (χ^2=10.51; p=0.005), exploratory behavior was higher during T1 than during T2 and T3.

A statistically significant difference was found between groups for the total amount of stress behavior (SB) during the three periods, with AG showing higher amounts than NAG (U=39.5; p=0.019).

Statistically significant differences were found for the total amount of two social behaviors: attention seeking from the owner (AG *vs* NAG, U=45.55; p=0.044) and sniffing the owner (AG *vs* NAG; U=42.5; p=0.029).

Compared with the NAG group, the AGS dogs displayed significantly longer durations of: attention-seeking from the owner (U=9.500; p=0.003), sniffing the owner (U=13.000; p=0.011), and primary proximity to the owner (U=9.000; p=0.009).

AGF dogs showed a higher level of behavioral signs of stress (U=21.000; p=0.052), a longer duration of autogrooming (U=20.000; p=0.046), and a higher attention-seeking from the owner (U=23.500; p=0.032), compared to NAG.

Interesting results emerged when comparing dogs that were aggressive toward strangers or toward familiar people. These findings suggest that through the systematic analysis of dog behavior during a consultation it is possible to observe different patterns of dogs' behavior according to the kind of diagnosis. Namely, during the behavioral consultations, dogs that are aggressive towards strangers showed more seeking behaviors towards the owners, whilst dogs that were aggressive towards family members showed more signs of stress. In conclusion, a careful observation of the behavior of dogs during a consultation could provide additional valuable support in the diagnostic process, and consequently in the risk assessment and in prescribing the therapy to dogs aggressive towards people. Moreover these results suggest that the aggressive dogs toward people should be treated not only for their dangerousness, but also for the impact that underlying stress and emotional aspects of the problem might have on the welfare of the dog, and highlighting how urgent its treatment should be.

It is therefore important that this problem is treated with rapid and effective treatment, both pharmacological and/or behavioral, and with an extensive collaboration between veterinary behaviorists and dog trainers

Key Words: aggressive dog; stress; behavioral consultation.

* *Corresponding Author*: angelo.gazzano@unipi.it

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Introduction

Human-directed aggression by dogs has a substantial impact on public safety and damages the relationship between owners and their dogs. In fact, approximately 4.5 millions dog bites occur each year in the United States alone, and almost 1 in 5 bites becomes infected (Lynn & Malamed, 2014). Moreover, aggression is one of the most frequent reasons for relinquishing dogs to shelters; Salman and colleagues (1998) found that almost half of dogs were relinquished to shelters due to behavior problems reported by the relinquisher and 12% of those dog has bitten a person. These cases are a real challenge for veterinary behaviorists, who must safeguard the relationship between dogs and owners in addition to protecting the public. The owner-dog relationship, being based on an attachment bond (Mariti et al., 2013a), may be undermined or broken by aggressive episodes, opening the way for the dog to be relinquished to the shelter. Aggression towards people is also both evidence of stress and a source of stress for dogs. The difficulty of a balanced relationship with the human being, with whom the dog has shared a long evolutionary path, can lead to a state of stress manifested by recognizable behaviors (Mariti et al., 2012). Such stress is often worsened by the use of positive punishment by the owner.

The aim of this research was to analyze the behavior of dogs aggressive towards people in a clinic environment and to compare it with the behavior of dogs affected by other behavioral disorders, in order to highlight differences especially concerning the emission of stress signals.

Subjects, materials and methods

For the present study, 26 cases were analyzed, divided into 2 groups: group AG consisted of 13 dogs showing aggression towards people, while group NAG included 13 dogs with behavioral problems other than aggression towards people. Eighty four point five percent of AG (n=11) and 53.8% NAG dogs (n=7) were males. In AG, a subgroup of 7 subjects (53.8%) showed aggression toward family members (AGF), while the remaining dogs (n=6; 46.2%) were aggressive towards strangers (AGS). In NAG, 77.0% (n=10) had phobias of various types, 15.4% (n=2) showed aggression toward co-specifics, and 7.6% (n=1) were overly excitable. In both the AG and NAG groups, the proportion of dogs that were pure bred was 53.8% (n=7).

All dogs underwent behavioral consultations at the Department of Veterinary Sciences, University of Pisa (Italy); the first consultation of each dog was videoed for later analysis. Behavioral consultations were carried out in a room that was unfamiliar to the animals, with dogs off-leash and without any restraint, in the presence of the owners and, sometimes, of a dog trainer.

For each video, 30 minutes were examined by a trained person as follows: T1 from 0 to 10 minutes; T2 from 25' to 35'; T3 from 50' to 60'. The observer was blind to the group each dog belonged to.

The behavioral analysis consisted in measuring the duration (in seconds) of the behaviors listed in an ethogram (Tables 1 and 2).

Table 1. Non social behaviors analyzed.

Behavior	Definition	References
Exploration	Activities directed toward objects in the room. Sniffing, visual inspection from distance (staring or scanning), close visual inspection, licking.	Prato Previde et al., 2003; Mariti et al., 2013a
Static exploration	The dog is exploring the surrounding environment from a static position (standing, sitting or lying down).	Present study

Behavior	Definition	References
Stretching	The dog stretches the body and legs.	Beerda et al., 1998
Locomotion	Motor activity other than exploring, playing and following.	Mariti et al., 2014, modified from Prato Previde et al., 2003
Sitting	The dog has its rump on the floor while the front legs are stretched out and the chest does not touch the floor.	Mills et al., 2014
Standing	The dog is standing with all four paws touching the floor.	Mills et al., 2014; Schipper et al., 2008
Lying down	The dog rests its chest on the floor but is still attentive to his surroundings.	Mills et al., 2014
Sleeping	The dog lies down with closed eyes.	Modified from Graham et al., 2005
Orienting towards the door	Staring at the door.	Prato Previde et al., 2003; Mariti et al., 2013b; Ricci et al., 2011; Mariti et al., 2014
Behaviors towards the door	Activities directed towards the door: scratching, digging, pushing the nose.	Prato Previde et al., 2003; Mariti et al., 2013a; Ricci et al., 2011; Mariti et al., 2014
Resting near the door	Time spent near the door (<1 m) with or without the nose facing the exit.	Mariti et al., 2013b; Ricci et al., 2011; Mariti et al., 2014
Barking	Dog vocalization.	Cafazzo et al. 2014; Prato-Previde et al., 2003
Yelping	Acute vocalization.	Prato Previde et al., 2003
Growling	Low, guttural, menacing sound.	Prato Previde et al., 2003
Nose licking	The dog licks the upper part of its muzzle.	Beerda et al., 1998; Tod et al., 2005; Rooney et al., 2007; Rooney et al., 2009
Individual play	Activities directed towards a toy, without social interactions; it includes chewing, biting, rolling or chasing a toy.	Prato Previde et al., 2003
Yawning	The dog opens its mouth, breathing in and out in quick succession.	Cafazzo et al., 2014
Shaking	The dog shakes its body.	Beerda et al., 1998; Schipper et al., 2008
Scratching	The dog scratches its body vigorously with the aid of a hind leg.	Cafazzo et al., 2014
Autogrooming	Whilst sitting or standing, the dog chews/licks its fur or body parts.	Schipper et al., 2008
Trembling	Tremors and shaky movements of the body or head.	Beerda et al., 1998
Urination	The dog urinates	Beerda et al., 1998; Casey, 2014; Tod et al., 2005
Drinking	The dog drinks water from the bowl.	Schipper et al., 2008
Marking	Activities such as urinating, defecating or activities not previously included.	Prato-Previde et al., 2003

Table 2. Social behaviors analyzed.

Behavior	Definition	References
Attention seeking	Request of play, attention and contact (stroking) from a person.	Mariti et al., 2014; Ricci et al., 2011, modified from De Palma et al., 2009
Physical contact	Any physical contact with the owner. Primary: the dog looks for the owner. Secondary: the owner looks for the dog.	Modified from Mariti et al., 2014; Modified from Mariti et al., 2013a
Following	Following a person or another dog in the room.	Mariti et al., 2014, modified from Prato Previde et al., 2003; Mariti et al., 2013b; Ricci et al., 2011
Proximity	Proximity (but not touch) for at least 3 seconds; between the dog and the owner there is a distance of less than 1.5 times the length of the dog. Primary: dog looks for the owner. Secondary: the owner looks for the dog.	Mariti et al., 2014, modified from Mariti et al., 2013a; Ricci et al., 2011
Approach	Approach with clear visual orientation toward the owner or other people in the room.	Mariti et al., 2014; Mariti et al., 2013a, modified from Prato Previde et al., 2003
Visual orientation	Directing the gaze to the owner or one of the persons in the room (for at least 0.5 seconds), regardless of the distance that separates the dog from the person.	Mariti et al., 2014, modified from Mariti et al., 2013a; Ricci et al., 2011, modified from Prato Previde et al., 2003
Social play	The dog plays with another dog or person.	Spangenberg et al., 2006
Sniffing	Search for a particular smell of dogs and/or people.	Present study
Avoiding	Turning the head, or anything else put in place to avoid contact with another dog or a stranger.	Mariti et al., 2014

According to the results of Shapiro-Wilk test ($p<0.05$), data was not normally distributed and therefore analyzed using a non-parametric statistics. The statistical analysis was performed using the Friedman and Wilcoxon tests ($p<0.05$) to highlight any differences within groups among the three analyzed time periods.

The Mann Whitney test ($p<0.05$) was then used to compare the social and non-social behaviors displayed by the two groups.

Social behaviors were recorded for dogs towards each person present in the consultation room, e.g. the veterinary behaviorist, the owner/owners (1 to 4) and, when present, the dog trainer. When more owners were present, the mean of each social behavior towards all owners was calculated and used for statistical analysis.

Results

As regards the nonsocial behaviors expressed by the dogs in the three analyzed time periods, a statistically significant difference was only found between the three periods for exploratory behavior; this difference was observed in both the AG ($\chi^2=14.00$; $p=0.001$) and the NAG ($\chi^2=10.51$; $p=0.005$). AG dogs carried out more exploratory behavior especially in T1 compared to T2 ($Z=-2.75$; $p=0.006$) and T3 ($Z=-2.98$; $p=0.003$). The same pattern was also observed in the NAG, with

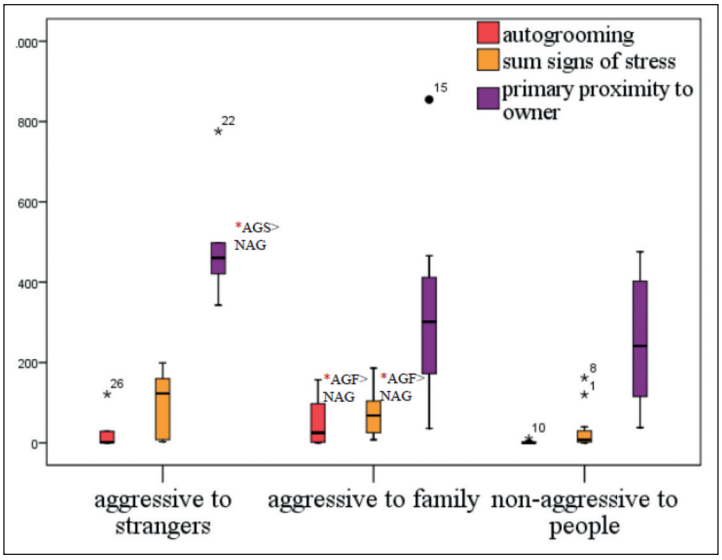

Fig. 1. Time spent (s) in primary proximity to the owner, signs of stress and autogrooming in the three groups of dogs analyzed: AGS = dogs aggressive towards strangers. AGF = dogs aggressive towards familiar people. NAG = dogs non aggressive towards people. For each box, the bottom and top horizontal lines represent the lowest and highest values, the lowest and top edge of the tinted box represent the lower and upper quartile, the horizontal line within the tinted box represents the median, the small circles represent the outliers, and the stars represent the extreme outliers.

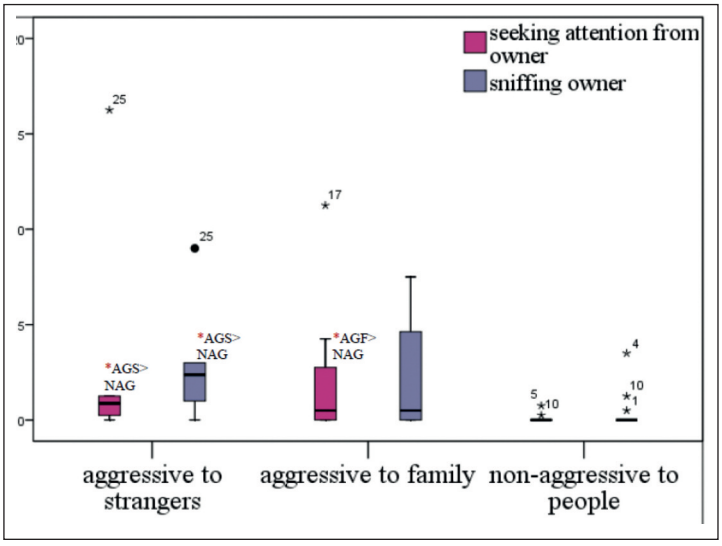

Fig. 2. Time spent (s) in sniffing the owner and attention seeking from the owner in the three groups of dogs analyzed: AGS = dogs aggressive towards strangers. AGF = dogs aggressive towards familiar people. NAG = dogs non aggressive towards people. For each box, the bottom and top horizontal lines represent the lowest and highest values, the lowest and top edge of the tinted box represent the lower and upper quartile, the horizontal line within the tinted box represents the median, the small circles represent the outliers, and the stars represent the extreme outliers.

exploratory behavior being greater in T1 than in T2 (Z=-2.9; p=0.004) and T3 (Z=-2.43; p=0.015). Since no other differences were found for social or non-social behaviour between the three time periods, the three focal periods were summed and then analyzed as a single period of 30 minutes of observation.

Among the non-social behaviors, those recognized as indicators of stress (SB: licking lips, yawning, scratching, shaking, trembling, autogrooming and whining) were summed to obtain an overall measure of stress.

A statistically significant difference was found for the sum of SB in the three periods, with the value being higher in the AG than in the NAG (U=39.5; p=0.019).

With respect to social behaviors, significant differences were found for two social behaviors: attention seeking from the owner (AG *vs* NAG, U=45.55; p=0.044) and sniffing the owner (AG *vs* NAG; U=42.5; p=0.029).

Compared with the NAG group, the AGS dogs displayed significantly longer durations of: sniffing the owner (U=13.000; p=0.011), primary proximity to the owner (U=9.000; p=0.009), and attention-seeking from the owner (U=9.500; p=0.003) (Figs. 1 and 2).

AGF dogs, compared to NAG, showed a statistically longer attention-seeking from the owner (U=23.500; p=0.032), a strong tendency for a higher level of behavioral signs of stress (U=21.000; p=0.052), and a statistically longer duration of autogrooming (U=20.000; p=0.046), (Fig. 1 and 2). No difference was found between AGF and AGS groups.

Discussion

Even taking into account limitations due to the small number of cases examined, this research provides valuable insights for a better understanding of canine aggressive behaviors.

Aggression is one of the problems that most affects the social relationship between dogs and owners. This is especially true for aggression toward people, but it also occurs when aggressive behavior is manifested against co-specifics, because owners of the aggressor or attacked dog are often victims of redirected aggression. The alteration of dog-human relationship is particularly serious for social species showing reconciliation after aggression, a phenomenon described in canine and other animal species (Gansloßer, 2009; Cozzi et al., 2010).

As regards the results obtained, we found that during the first 10 minutes of the behavioral consultation, both aggressive and non-aggressive dogs had a marked level of exploratory activity, which was significantly greater than that expressed in the other two analyzed periods. This is consistent with previous research, such as Prato-Previde (2003) and Palmer & Custance (2008), who found that dogs explore an unknown room significantly more during the earlier stages of an Ainsworth's Strange Situation test. Probably the exploratory activity decreases over time because of a diminished curiosity of the subject toward the environment, as the individual has already collected all the information that it requires.

The most interesting findings emerged when comparing dogs that were aggressive toward strangers with those that were aggressive toward familiar people. These findings suggest that through the systematic analysis of dog behavior during a consultation it is possible to observe different patterns of dogs' behavior according to the kind of diagnosis. Namely, during the behavioral consultations, dogs that were aggressive towards strangers showed more seeking behaviors towards the owners, whilst dogs that were aggressive towards family members showed more signs of stress.

It may be hypothesized that the higher level of social, affiliative behaviors displayed by AGS dogs towards their owners were signs of fear, namely fear of a stranger, due to the presence of an unfamiliar person (the behaviorist and, possibly, the dog trainer). It is likely (even considering the behavioral report of the veterinary behaviorist) that these dogs showed an aggression towards strangers which was fear-related, and in the context of the consultations they might seek for a secure base; this was expressed as an increase in the social behaviors towards the owner (Mariti et al., 2013a).

The stress displayed by AGF dogs was probably related to a state of anxiety, originating in inconsistency and conflict in the dog-owner relationship, and in the use of punishment by the owners (as also described in the behavioral report of the veterinary behaviorist), who were present and therefore caused anxiety in the dogs of this group. In fact, it is common that dogs showing aggression towards their owners are punished for this behavior, thus developing (or increasing) the level of anxiety of these dogs (Luescher & Reisner, 2008). In addition, irrespective of the presence of unfamiliar people and the fear that this might evoke in the AGD dogs, both AGF and AGS dogs were in an unfamiliar environment in which they might feel insecure and inclined to seek a secure base. The past stressful relationship between AGF dogs and their owners means that the owner, although present, was not a reliable and unequivocal source of security in the face of an unfamiliar and stressful situation. The presence of a high level of attention-seeking from the owner seems to be in disagreement with such statements. However, due to the method of analysis carried out in the current study, it is not possible to understand whether the dogs were seeking attention from the owner they were aggressive to (and potentially the person who punished the dog) or to another member of the family. More research is needed to clarify this point.

Conclusions

In conclusion, a careful observation of the behavior of dogs during a consultation could provide additional valuable support in the diagnostic process, and consequently in the risk assessment and in prescribing the therapy to dogs aggressive towards people. Moreover these results suggest that the aggressive dogs toward people should be treated not only for their dangerousness, but also for the impact that underlying stress and emotional aspects of the problem might have on the welfare of the dog, and highlighting how urgent its treatment should be.

It is therefore important that this problem is treated with rapid and effective treatment, both pharmacological and/or behavioral, and with an extensive collaboration between veterinary behaviorists and dog trainers (Mariti et al., 2010).

References

Beerda B., Schilder M.B.H, van Hooff J.A.R.A.M., de Vries H.W., Mol J.A. Behavioural, saliva cortisol and heart rate responses to different types of stimuli in dogs. Appl. Anim. Behav. Sci. 1998; 58: 365-38.

Cafazzo S., Maragliano L., Bonanni R., Scholl F., Guarducci M., Scarcella R., Di Paolo M., Pontier D., Lai O., Carlevaro F., Bucci E., Cerini N., Carlevaro L., Alfieri L., Fantini C., Natoli E. Efficacy of dog appeasing pheromone in reducing stress and fear related behaviour in shelterdogs. Physiology & Behavior 2014; 133: 223-229.

Casey A.R., Loftus B., Bolster C., Richards J.G., Blackwell J.E., Human directed aggression in domestic dogs (*Canis familiaris*): Occurrence in different contexts and risk factors. Appl. Anim. Behav. Sci. 2014; 152: 52-63.

Cozzi A., Sighieri C., Gazzano A., Nicol C.J., Baragli P. Post-conflict friendly reunion in a permanent group of horses (*Equus caballus*). Behav. Processes. 2010; 85: 185-190.

De Palma C. The temperament of shelter dogs. J.V.B. Clin. Appl. Res. 2009; 4: 83-84.

Gansloßer U. Dynamics of conflict management in canines: Preliminary results. J.V.B. Clin. Appl. Res. 2009; 4: 10.

Graham L., Wells D.L., Hepper P.G. The influence of olfactory stimulation on the behaviour of dogs housed in a rescue shelter. Appl. Anim. Behav. Sci. 2005; 91: 143-153.

Luescher A.U., Reisner I.R. Canine aggression toward familiar people: a new look at an old problem.Vet. Clin. North Am. Small Anim. Pract. 2008; 38: 1107-30.

Lynn K., Malamed R. Canine aggression toward people: a guide for practioners. Vet. Clin. Small Anim. 2014; 44: 599-628.

Mariti C., Papi F., Mengoli M., Zilocchi M., Giambanco P., Gazzano A. Analysis of the cooperation between veterinary behaviorists and dog trainers in resolving canine behavioral problems. J.V.B. Clin. Appl. Res. 2010; 5: 24-25.

Mariti C., Gazzano A., Lansdown Moore J., Baragli P., Chelli L., Sighieri C. Perception of dogs's stress by their owners. J.V.B. Clin. Appl. Res. 2012; 7: 213-219.

Mariti C., Ricci E., Zilocchi M., Gazzano A. Owners as a secure base for their dogs. Behaviour 2013a; 150: 1275-1294.

Mariti C., Ricci E., Carlone B., Moore J. L., Sighieri C., Gazzano A. Dog attachment to man: A comparison between pet and working dogs. J.V.B. Clin. Appl. Res. 2013b; 8: 135-145.

Mariti C., Carlone B., Ricci E., Sighieri C., Gazzano A. Intraspecific attachment in adult domestic dogs (Canis familiaris): Preliminary results. Appl. Anim. Behav. Sci. 2014; 152: 64-72.

Mills D., Karagiannis C., Zulch E. Stress - Its Effects on Health and Behavior: A Guide for Practitioners. Vet. Clin. North Am.: Small Anim. Practice 2014; 44: 525-541.

Palmer R., Custance D. A counterbalanced version of Ainsworth's Strange Situation Procedure reveals secure-base effects in dog-human relationships. Appl. Anim. Behav. Sci. 2008; 109: 306-319.

Prato-Previde E., Custance M.D., Spiezio C., Sabatini F. Is the dog-human relationship an attachment bond? An observational study using ainsworth's strange situation.Behav. 2003; 140: 225-254.

Ricci E., Mariti C., Carlone B., Borgognini-Tarli S., Sighieri C., Gazzano A. Does the breed influence dog's attachment to man? a preliminary study. J.V.B. Clin. Appl. Res. 2011; 6: 91.

Rooney N., Gaines S., Bradshaw J.W.S. Behavioural and physiological indicators of shelter dogs' welfare: Reflections on the no-kill policy on free-ranging dogs in Italy revisited on the basis of 15 years of implementation. Physiology & Behavior 2007; 92: 847-854.

Rooney N., Gaines S., Hiby E. Behavioural and glucocorticoid responses of dogs (Canis familiaris) to kennelling: Investigating mitigation of stress by prior habituation. A practitioner's guide to working dog welfare. J.V.B. Clin. Appl. Res. 2009; 4: 127-134.

Salman M.D., New J.G., Scarlett J. M., Kass P.H., Ruch-Gallie R., Hetts S. Human and animal factors related to the relinquishment of dogs and cats in 12 selected animal shelters in the United States. J. Appl. Anim. Welf. Sci. 1998; 1: 207-226.

Schipper L.L., Vinke C.M., Schilder M.B.H., Spruijt B.M. The Effect of Feeding Enrichment Toys on the Behaviour of Kennelled Dogs (*Canis Familiaris*). Appl. Anim.Behav. Sci. 2008; 114: 182-195.

Spangenberg E.M.F., Björklund L., Dahlborn K. Outdoor housing of laboratory dogs: Effects on activity, behaviour and physiology Appl. Anim. Behav. Sci. 2006; 98: 260-276.

Tod E., Brander D., Waran N. The effect of feeding enrichment toys on the behaviour of kennelled dogs (*Canis familiaris*) Appl. Anim. Behav. Sci. 2005; 93: 295-308.

Stress in cani aggressivi verso le persone: analisi comportamentale durante la consulenza

Angelo Gazzano[1], Silvia Migoni[2], Giovanna Guardini[2], Jon Bowen[3], Jaume Fatjò[4], Chiara Mariti[1]

[1] *Dipartimento di Scienze Veterinarie, Università of Pisa - Italia*
[2] *Collaboratore esterno*
[3] *Royal Veterinary College, North Mymms - UK*
[4] *Chair of Affinity Foundation Animals and Health, Department of Psychiatry and Forensic Medicine, Universitat Autònoma de Barcelona - Spagna*

Sintesi

L'aggressività canina, soprattutto quella rivolta alle persone, è uno dei più gravi problemi comportamentali riferiti ai comportamentalisti.

Lo scopo di questo studio è stato quello di analizzare il comportamento di cani aggressivi verso le persone durante la consulenza clinica e di confrontarlo con quello di cani affetti da altre problematiche comportamentali.

Per il presente studio sono stati analizzati 26 casi clinici, divisi in due gruppi. Un gruppo di cani aggressivi (AG), costituito da 13 cani aggressivi nei confronti delle persone, ed un gruppo di cani non aggressivi (NAG), formato da 13 soggetti con altri problemi comportamentali. Il gruppo AG è stato ulteriormente diviso in altri due sottogruppi: il gruppo dei cani aggressivi verso persone estranee (AGS; n=6) ed un gruppo di cani aggressivi verso persone familiari (AGF; n=7).

Tutti i cani sono stati sottoposti a consulenza comportamentale che è stata videoregistrata per essere in seguito analizzata in modo da misurare la durata (in secondi) dei comportamenti sociali e non sociali.

Di ogni videoregistrazione sono stati esaminati 3 periodi per un totale di 30 minuti: T1 da 0 a 10 minuti, T2 da 25 a 35 minuti e T3 da 50 a 60 minuti.

Confrontando i comportamenti emessi nei tre periodi considerati, una differenza statisticamente significativa è stata rinvenuta solo per il comportamento esplorativo: in entrambi i gruppi, AG e NAG, questo comportamento è stato manifestato maggiormente in T1 che in T2 e T3.

Una differenza statisticamente significativa è emersa tra i gruppi per quanto riguarda la quantità totale dei comportamenti di stress (SB) durante i 3 periodi, con i cani del gruppo AG che mostravano un maggior livello di stress rispetto a NAG.

Un'altra differenza statisticamente significativa è quella rinvenuta a carico di due comportamenti sociali: la ricerca delle attenzioni del proprietario (AG *vs* NAG, U=45,55; p=0,044) ed annusare il proprietario (AG *vs* NAG; U=42,5; p=0,029).

In confronto a NAG, i cani del gruppo AGS hanno mostrato una più prolungata ricerca delle attenzioni del proprietario (U=9,500; p=0,003), l'annusare il proprietario (U=13.000; p=0.011) e la prossimità al proprietario (U=9,000; p=0,009).

I cani del gruppo AGF hanno inoltre mostrato un livello più alto di comportamenti di stress (U=21,000; p=0,052), una maggior durata dell'autogrooming (U=20,000; p=0,046) e di ricerca di attenzioni dal proprietario (U=23,500; p=0,032) in confronto al gruppo NAG.

In conclusione, un'attenta osservazione del comportamento dei cani durante la consulenza può fornire un addizionale utile supporto nel processo diagnostico e conseguentemente nella valutazione del rischio e nella prescrizione della terapia. Inoltre, questi risultati suggeriscono che i cani aggressivi verso le persone dovrebbero essere trattati non solo per la loro pericolosità ma anche per l'impatto che lo stress e gli aspetti emozionali del problema possono avere sul benessere dell'animale.

È perciò importante che questo problema sia affrontato con un trattamento rapido ed efficace, farmacologico e/o comportamentale, e con un'intensa collaborazione tra comportamentalisti ed istruttori cinofili.