FEAR-MOTIVATED AGGRESSION IN DOGS: PATIENT CHARACTERISTICS, DIAGNOSIS AND THERAPY

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Abstract *Animal Welfare 1997, 6:* 9-15

The aim of the study was to characterize dogs in which fear-motivated aggression was diagnosed, to describe the therapy used, and to evaluate the effectiveness of this therapy using a retrospective descriptive study. During the research period 284 dogs were referred for problem behaviour. Fear-motivated aggression was diagnosed in 73 (26%) dogs: intact males (35), castrated males (15), intact females (11) and castrated females (12). The mean age of the animals was 3.4 years ± 2.2 (SD). Mixed-breed dogs were most frequent, followed by Golden Retrievers, Rottweilers and Bernese Mountain Dogs. The majority of the dogs expressed growling, snapping, biting, ears down, tail down and low posture. The aggression occurred mainly inside the house, towards adults or children, and especially when the dog was approached and/or touched. Diagnosis was based on data about the behavioural expressions of the animals, and about owner-dog interactions, obtained from both the owner and our own observation. Treatment consisted of 1) avoiding eliciting stimuli, 2) optimizing owner-dog communication, 3) adaptation of the owner's punishing threats to the dog's response to punishment, and 4) for a certain period fitting the dog with a choker chain connected to a leash during the day. The behaviour of the dogs improved (55; 75%), remained unchanged (13; 18%), or deteriorated (5; 7%). In conclusion: fear-motivated aggression in dogs is likely to be more frequent than generally is assumed. Growling or biting in a low posture towards both adults and children, especially when the animals were approached or touched inside the house, were the main characteristics on which the diagnosis fear-motivated aggression was based. Therapy, mainly based on optimizing communication between owner and dog, proved significantly effective.

Keywords: *animal welfare, diagnosis, dog, fear-motivated aggression, therapy*

Introduction

Aggression has been labelled the most frequent behaviour problem in dogs (Beaver 1983; Hart & Hart 1985; Knol 1987). Fear-induced aggression is one of the aggression types mentioned in reports concerning the classification of aggression (Beaver 1983, 1993; Borchelt 1983). Not many details about the behavioural characteristics of fear-induced aggression have been reported. Diagnosis mainly seems to be based on the dog's display of

submissive body signs (Beaver 1983). Fear-induced aggression appears to be often misinterpreted as protective aggression (Young 1988). Apparently, in many dogs the fear-motivation is not recognized, although the aggression is defensive rather than offensive with the dog defending itself rather than owner, territory or property. Hence, fear-motivated aggression will be more common than is suggested in the literature (Young 1988). Although there are several publications in which fear-motivated aggression is discussed, there have been no reports on clinical trials in which patients, diagnosis and therapy have been described.

The aim of this study was to characterize dogs in which fear-motivated aggression was diagnosed, to describe the therapy used, and to evaluate the effectiveness of this therapy.

Animals and methods

Cases

Dogs referred to the Utrecht University Companion Animal Clinic for behavioural problems between January 1 1991 and January 1 1994 were subjected to a retrospective descriptive study.

History-taking and diagnosis

The procedures of history-taking and diagnosis were carried out according to a standard protocol, which includes assessment of the behavioural problem, the present behaviour, living conditions and history of the dog. This Utrecht approach is aimed at a) reliable and valid assessment of the behavioural characteristics, b) accurate interpretation of the problem behaviour (diagnosis), c) adequate therapy and d) monitoring progress (follow-up) (Knol 1994a, 1995). Diagnosis was based on our own observation of the dog's behaviour and of owner-dog interactions during the consultation, as well as on the owner's description of the dog's behaviour. The behavioural characteristics on which the diagnosis was based are listed in the Results. From the complete set of data of each patient, the following were selected for this study.

Description:

- breed, sex and age.

Behaviour and environment:

- growling, snapping, biting; position of ears and tail (up, down); body posture (high, low).
- aggression directed towards adult people (known [= family member] or unknown [= not family member]), children (known or unknown); when approached or touched; inside or outside the house.
- owner's attitude towards the dog's aggression (punishing, ignoring, withdrawing, quieting).
- fear of noise, people, dogs or punishment.
- owner's opinion about the dog's friendliness, playfulness, nervousness, fearfulness, aggressiveness, attachment.

Therapy

Treatment consisted of 1) avoiding eliciting stimuli, 2) optimizing owner-dog communication, 3) adaptation of the owner's punishing threats to the dog's response to punishment and 4) for one to three weeks, fitting the dog with a choker chain connected to a leash during the day, to be able to handle the dog remotely.

The main eliciting stimuli to be avoided by the owner were: approach, touch and inadequate punishing threats. Optimizing the owner-dog communication included the following: a) The owner reinforces desirable behaviour of the dog intermittently but frequently with praise, non-threatening touch of the ventral neck or sternal region, or food rewards. b) The owner punishes undesirable behaviour of the dog consistently and unambiguously. To punish, the owner says a threatening 'no' together with one of the following actions. The owner gives a jerk on the leash which is connected to a choker chain, or shakes the dog by the scruff while pressing the animal down, or puts pressure with one or both hands around the muzzle of the dog. c) The owner is friendly towards the dog when rewarding, neutral when giving commands, and threatening when punishing, to enable the dog to differentiate between these important stimulus situations. d) The owner stops petting except after the dog has performed a command obediently. e) The owner ignores attention-drawing behaviour. f) The owner carries out obedience training indoors (up to 50 times/day: come, sit, free) and outdoors (2–3 times/day for 5–10min: come, heel, sit, down, stay, free). 'Free' means that the dog is no longer under command and is allowed to move around freely. g) The owner effectuates an adequate response by the dog to each command and to each punishment by applying the measures a) to f) appropriately.

Follow-up

Owners were telephoned routinely one and two weeks after the consultation to monitor the development of the dog's behaviour from the beginning of therapy. Thereafter, the frequency of follow-up calls depended on the progress made. The follow-up period was at least three months. During this period the owner was advised to adapt treatment to the progress made. This means that the execution of therapeutic measures was gradually reduced to an effective minimum level of intensity. The results of therapy were scored as improved, unchanged or deteriorated according to the owner's opinion.

Statistical analysis

The Fisher's exact test was used to determine the significance of the difference between the numbers of intact and castrated males below two years of age. In other cases the Sign test was applied. The level of significance was $P \leq 0.05$.

Results

During the research period 284 dogs were referred for behavioural problems. In 73 (26%) of these cases, fear-motivated aggression was diagnosed. Patients were intact males (35; 48%), castrated males (15), intact females (11) and castrated females (12). The numbers of intact and castrated males differed significantly. There were significantly more intact (9/35) than castrated (1/15) males below two years of age. The mean age of patients when presented was 3.4 years ± 2.2 (SD). Mixed-breed dogs were most frequent (18; 25%), followed by Golden Retrievers (9), Rottweilers (6) and Bernese Mountain Dogs (4).

The dogs expressed growling (64), snapping (31), biting (50); ears down (56), tail down (42), low posture (51); ears up (8), tail up (17) and/or high posture (11). The aggression occurred inside (68) or outside (49) the house; towards unknown (54) or known (53) adults; towards unknown (47) or known (45) children; especially when the dog was approached (58) or touched (43). Owners punished their aggressive dog using both voice and some physical

method (63), or ignored (16), quieted (13) or withdrew (17). Patients displayed fear of people (29), of noise (27), of dogs (5) or when punished (35). Owners considered their dog attached (67), playful (61), friendly (56), fearful (45), nervous (44) and/or aggressive (36). There were significantly more owners that considered their dog attached, or playful, or friendly than owners considering their dog not attached, or not playful, or not friendly.

The behaviour of the dogs improved (55; 75%), remained unchanged (13; 18%) or deteriorated (5; 7%). Two dogs of the last category were euthanased. Therapy proved to be significantly effective.

Discussion

The results indicate that fear-motivated aggression is diagnosed more often in the Utrecht Clinic (26% of aggression diagnoses) than has been reported elsewhere (± 10% of aggression diagnoses) (Beaver 1983, 1993). This could support the assumption that the fear motivation in this type of aggression is not always recognized, and hence fear-motivated aggression is more frequent than is generally assumed (Young 1988). The problem with recognition of fear characteristics is probably due to the fact that veterinarians are rarely able to see the dog displaying problem behaviour as most animals only show it at home. The veterinary practitioner receives most of the behavioural information from the owner. Because most owners are not skilled in observing behaviour, they may misinform the veterinarian. This problem could be tackled if the owner brought in a video recording of the dog displaying the problem behaviour at home, to be studied before or during the consultation. In the Utrecht approach this step has been recently integrated.

The finding that intact males showed significantly more fear-motivated aggression than did castrates confirms other results (Borchelt 1983) and suggests that castration could be an effective therapy. The latter, however, has not been reported (Hopkins *et al* 1976). A positive correlation between plasma testosterone concentrations and aggression has been found in rodents, cats, horses and cattle (Hart & Hart 1985; Knol & Egberink-Alink 1989), but not in dogs (LeBoeuf 1970). This could explain the lack of therapeutic effect of castration, but certainly not the occurrence of fear-motivated aggression more often in intact than in castrated males.

The mean age of these fear-motivated aggressive dogs was 3.4 years. This was similar to that of all dogs presented for aggression elsewhere (Beaver 1993). This advanced age suggests that learning is an important developmental factor in dogs with aggression problems, fear-motivated or not, for if aggression were mainly genetically determined, a mean age lower than 3.4 years might be expected. Apparently the dogs need some years to learn how to use aggression as an instrument to reach their goals (Knol 1994b). This might imply that the age of onset of aggression problems depends on the genetically determined height of the aggression threshold in an individual dog.

Mixed-breed dogs were found to be the major group in several aggression studies (Borchelt 1983; Wright 1991; Beaver 1993). This result will merely reflect the proportion of mixed-breed dogs in the total population. Further consideration of this point was not possible because reliable figures about mixed-breed dog numbers in The Netherlands are lacking. The main pure breeds involved in fear-motivated aggression in our study (Golden Retriever, Rottweiler and Bernese Mountain Dog) belong to the ten most frequent dog breeds in The Netherlands (Ubbink G J personal communication 1995). All three of them have or

had an aggression problem which was recognized by their breeding associations (Van der Velden *et al* 1976). Both factors, which will reflect national population characteristics, will have added to our results. This may explain the difference from other results revealing German Shepherd, English Cocker Spaniel and Miniature Poodle as the most frequent fear-motivated aggressive breeds (Borchelt 1983).

Dogs with fear-motivated aggression might be expected to direct their aggression mainly towards people not belonging to the family (unknown adults and children). Our results reveal, however, that these dogs also threaten or attack family members (known adults and children). This may indicate that the dogs have generalized their aggression from unfamiliar to familiar people (McFarland 1993). Eighty-six per cent of the owners punished aggressive behaviour in their dogs. As the dogs did not respond by reducing the frequency of the behaviour, it can be concluded that this punishment is ineffective. In fear-motivated aggression, this can be either due to the owner threatening too much or too little. In either case, however, the aggression of the dog will be reinforced. Hence, the generalization of aggression will be stimulated. This effect will have been strengthened by those owners who responded to the aggression by ignoring, quieting or withdrawal. Thus the dog's fear-motivated aggressive behaviour may be shaped by owner-related operant learning as is indicated above (McFarland 1993).

Some dogs in which fear-motivated aggression was diagnosed seemed to express postures consistent with dominance. On the one hand this may reflect insufficient observational skills of owners. On the other hand it might explain that clinicians diagnose aggression problems differently. In either case the need for improved observational methods, for example by video recording, is emphasized (Young 1988; Beaver 1993). Additionally, it must be stressed that dogs showing aggression, including fear-motivated aggression, will often induce flight behaviour in the owner. This reinforcement of the aggression may lead to a certain degree of ambivalence in the dog: the frequency and/or intensity of aggression will increase, but the motivation for the threats or attacks remains fear. Data on whether or not repeated reinforcement of fear-motivated aggression can induce changes in the dog's posture during the attacks have not been found. It seems plausible, however, that owners who feel seriously threatened by their dog will not be able to objectively observe the posture of the dog during the threat. The mechanisms mentioned in this and the preceding paragraph, in part explain the apparent contradiction in diagnosis and posture of some of the dogs.

Nearly all owners considered their dogs to be attached. This has been found earlier for dogs referred to the Utrecht Clinic for both behavioural and somatic problems (Knol B W, Kroezen D and Nannes E M Separation-related behaviour problems in dogs: animal characteristics and therapy. Submitted.) It is even more remarkable that the number of owners considering their aggressive dog to be friendly, was significantly greater than the number of owners saying that their dog was not friendly. This result suggests a low frequency and a low level of danger of the aggressive behaviour and seems to be consistent with the high level of attachment found. Many owners interact with their dogs as if they were children and hence induce communication errors. These will eventually lead to a reversed dominance relationship in some cases. The therapeutic measures used in this study are aimed at improving the communication between owner and dog and, implicitly, at re-establishing a proper hierarchy between owner and dog. By demonstrating leadership, the

owner will decrease the dog's fear motivation, and hence decrease its fear-motivated aggression (Knol 1994b).

In the majority of patients, the behaviour improved within 3 months after the consultation. The four-track therapy proved to be significantly effective. It cannot be determined which of the four components of therapy added most to the improved behaviour. However, because communication errors are very common in owner-dog interactions, it is plausible to consider the optimized owner-dog communication a major behaviour-improving factor (Althaus 1987).

It is concluded that fear-motivated aggression is likely to be more frequent in dogs than is generally assumed, and that growling or biting in a low posture towards both adults and children, especially when the animals are approached or touched inside the house, are the main characteristics on which the diagnosis fear-motivated aggression was based. Therapy, mainly based on optimizing owner-dog communication, proved significantly effective.

Animal welfare implications

The welfare of the dogs in which fear-motivated aggression was diagnosed hardly seemed to be affected. This is in line with the view that these dogs learned to use the fear-aggression to reach certain goals. Nevertheless many of these dogs were at risk, because several owners considered euthanasia for their dogs in case the aggressive behaviour could not be changed sufficiently.

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