



## Research

# Canine aggression toward family members in Spain: Clinical presentations and related factors



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## ABSTRACT

Canine aggression toward family members represents a potential hazard for the owner's health and can severely compromise the welfare of the affected dogs. The aim of this retrospective study was to investigate the main features of canine aggression toward family members using cases from a referral practice. The cases were examined with respect to behavioral and environmental factors that may be related to this problem. Forty-three cases of canine aggression toward family members seen at the Animal Behavior Clinic (Barcelona School of Veterinary Medicine) were analyzed and compared with 50 canine cases with no such history. A logistic regression model was applied to identify environmental and behavioral factors that may be related to aggression toward family members. Dogs adopted before 7 weeks of age and those receiving treats from the table were more likely to present aggression toward family members. Dogs presenting an underlying painful condition were also more likely to be aggressive toward family members. According to the owner's description, most of the dogs showed an ambivalent posture during the aggressive events. These findings provide an insight into some of the factors related to canine aggression toward family members and may help to develop more effective preventive and treatment strategies. Even if causative links cannot be made, our findings certainly provide direction for further investigation.

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## Introduction

Canine aggression is the most common complaint in veterinary behavior referral practice (Bamberger and Houpt, 2006; Borchelt, 1983; Fatjó et al., 2006; Fatjó et al., 2007). The family members are the most common targets of the aggression (Fatjó et al., 2007). Statistical studies of dog bites to humans indicate that in most cases people are victims of their own dog or of a dog they know (Guy et al., 2001a; Rosado et al., 2009; Wright, 1990). Canine aggression can also severely compromise the welfare of the dog, itself, as most cases of aggression result from a negative emotional state and are often related to a stress response (Kurk et al., 2004). Furthermore, dogs presenting aggression are at a higher risk of being abandoned (Salman et al., 1998, 2000) or even euthanized because of the aggression (Overall, 2013).

Aggression can be influenced by genetics and environmental factors. Evidence of genetic effects on aggressive behavior has suggested that there may be breed effects (Amat et al., 2009; Duffy et al., 2008; Hart and Hart, 1985; Liinamo et al., 2007; Pérez-Guisado et al., 2006; Scott and Fuller, 1965). However, many studies have shown a large individual variation in behavior within breeds (Hart and Hart, 1985; Scott and Fuller, 1965; Wilsson and Sundgren, 1998) which indicates that preventive programs should be based on individuals rather than breed, itself.

Environmental and management factors have also been found to influence aggressive behavior (Arhant et al., 2010; Bennet and Rohlf, 2007; Casey et al., 2014; Guy et al. 2001b; Hiby et al., 2004; Jagoe and Serpell, 1996; O'Sullivan et al., 2008; Podberseck and Serpell, 1997; Schoning and Bradshaw, 2005; Tami et al., 2008; Voith et al., 1992); however, there is considerable variation in the results of different studies. Such variation may be related to the differences between the populations studied, the different methods used for evaluating the behavior, and the terminology used by the different authors. For instance, in a study performed in 100 dogs reported for biting a person, O'Sullivan et al. (2008) found a significant association between feeding the dog from the table during

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the 2 months before the bite incident and a history of biting a person. Jagoe and Serpell (1996), on the other hand, used a retrospective data from 737 dogs recruited from 4 different sources, and found that dogs allowed to sleep in the owner's bedroom had a higher prevalence of what they called competitive aggression (aggression toward people when attention is paid to others and to other dogs in the household) than dogs which slept elsewhere. Having slept on someone's bed in the first 2 months of ownership was found to be a risk factor for biting owners in a study performed by a telephone interview to the owners of 227 biting and 126 nonbiting dogs (Guy et al., 2001b). In contrast, Voith et al. (1992) analyzed 711 questionnaires that were available for the owners in the waiting room of a veterinary hospital and failed to find a relationship between sleeping in the owner's bed and other so-called anthropomorphic activities and the prevalence of behavior problems in general, including aggression.

Additional factors have been found to have an influence on the presentation of aggressive behavior. For instance, Podberseck and Serpell (1997) compared 2 groups of English Cocker Spaniel with different levels of aggression and found that dogs in the "high-aggression group" were given less time for exercise. Jagoe and Serpell (1996) found a lower prevalence of dominance aggression and possessive aggression in dogs chosen primarily for exercise. Using a questionnaire directed to dog's owners, Casey et al. (2014) found that the origin of the dog was a risk factor for aggression to household members. They also observed a relationship between the owner's age and family directed aggression and aggression toward unfamiliar people. The size of the dog was also found to be related to aggression. Thus, smaller dogs were found to have a higher risk of biting the owners in the study of Guy et al. (2001b), and in a study comparing the owner's behavior of smaller and larger dogs, smaller dogs were seen as more aggressive than larger ones (Arhant et al., 2010).

Finally, the influence of training was evaluated in various studies. Jagoe and Serpell (1996) found that obedience training was related to a reduced incidence of competitive aggression. Lack of obedience training was also associated with aggression (Schöning and Bradshaw, 2005) and other undesirable behaviors (Bennett and Rohlf, 2007). The use of punishment has been found to be associated with increased aggression (Arhant et al., 2010, Casey et al., 2014; Herron et al., 2009; Tami et al., 2008) and other behavioral problems (Hiby et al., 2004). Yet, as for earlier cited studies, the methodology of these studies differed a lot, so the results may not be applicable to all populations, and comparisons are difficult.

The effect of sex hormones was also considered a factor related to aggressive behavior in dogs. Some studies have found that males are overrepresented in the population of aggressive dogs (Amat et al., 2009; Borchelt, 1983; Fatjó et al., 2007; Reisner et al., 2005). Testosterone seems to act as a behavior modulator that allows the dog to react more quickly and intensely and for a prolonged period of time (Overall, 2013), and this may explain why male dogs are overrepresented in some studies of aggression. The influence of testosterone seems to be especially important in aggression to other dogs as castration decrease the aggression in 60% of cases (Hopkins et al., 1976). In females, on the other hand, spaying can increase the signs of impulse-control aggression in bitches that were already showing signs of aggression as puppies (O'Farrell and Peachey, 1990).

The description and evaluation of the behavior of the dog during the aggressive episodes can be important to understand the problem and implement successful and safe treatment. The influence of anxiety and conflicting motivations in aggressive problems has been recognized in the last few years (Leuscher and Reisner, 2008; Reisner, 2003). The term impulse-control aggression (Landsberg

and Denenberg, 2015; Overall, 2013) has been used to describe most cases of canine aggression toward family members. Impulse-control aggression can be defined as an abnormal, inappropriate, out-of-context aggression consistently exhibited by dogs toward people under any circumstance involving passive or active control of the dog's behavior or the dog's access to the behavior (Overall, 2013). This kind of aggression can be related to fearful or defensive behaviors, resource guarding, redirected behavior, or situations of conflict (Landsberg and Denenberg, 2015).

The aim of this retrospective study was to further investigate the main features of cases of canine aggression toward family members in a referral practice in Spain, and to identify behavioral and environmental factors that may be related to this problem. The information available in the literature about canine aggression toward family members varies substantially and so our findings may not be applicable to all populations. There is a need for more information, and more standardized information collection, so that factors related to canine aggression toward family members can be identified and understood.

## Materials and methods

### Sample

The 93 dogs that participated in this study were evaluated by 2 veterinarians specialized in behavioral medicine from 2011 through 2013 at the behavioral service of the Veterinary Hospital of the Autonomous University of Barcelona, Spain. A behavioral clinical diagnosis made for, and a physical and neurologic examination performed for all dogs. Information was collected from the medical records of these cases, and the independent variables considered are summarized in Table.

Aggression can be defined as an appropriate or inappropriate threat or challenge that is ultimately resolved by combat or deference (Overall, 2013). It can include behaviors such as barking, snarling or lip lifting, growling, snapping, or biting. Based on the target of the aggression, the cases in this study were categorized into 2 groups "aggressive toward family members" (AGR;  $n = 43$ ) and "non aggressive toward family members" (non-AGR;  $n = 50$ ). Dogs were classified as aggressive when they showed any sign of aggression toward the owners. The selection of the cases was random.

The control group (non-AGR) was composed of dogs that, according to the evaluation made by the clinicians, had behavioral problems other than aggression toward owners. The fact that these dogs were also seen and evaluated at the behavioral service allowed us to compare one part of the population seeking help from the clinic to another with different diagnoses and ensure that they were in different behavioral groups by diagnosis. It is often seen that many owners of aggressive dogs do not consider them as such; especially when the signs of aggression are subtle (Beaver, 2009). The behavioral problems of non-AGR dogs were aggression toward dogs ( $n = 15$ ), fear-related problems ( $n = 13$ ), aggression toward unknown people ( $n = 8$ ), separation anxiety ( $n = 7$ ), house soiling ( $n = 7$ ), destructive behavior ( $n = 5$ ), lack of obedience ( $n = 4$ ), cognitive dysfunction syndrome ( $n = 2$ ), excessive vocalization ( $n = 2$ ), coprophagia ( $n = 1$ ), and attention-seeking behavior ( $n = 1$ ). Aggressive dogs were grouped according to the target (familiar people, unknown people, or other dogs) independently of the behavioral diagnosis. The fact that the control dogs also have behavioral problems may affect the interpretation of the results.

To evaluate the aggressive behavior, the context in which aggression occurs and the postures of the dogs in the AGR group were taken into account. Such information was obtained from the owner's descriptions of the aggressive events ( $n = 43$ ) and in some

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