The Veterinary Journal 206 (2015) 284–288

Contents lists available at ScienceDirect

The Veterinary Journal

journal homepage: www.elsevier.com/locate/tvjl

Human behavior preceding dog bites to the face

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ARTICLE INFO

Article history:
Accepted 6 October 2015

Keywords:
Behavior
Dog
Bites to the face
Facial injury
Human

ABSTRACT

Facial injuries caused by dog bites pose a serious problem. The aims of this study were to determine human behavior immediately preceding a dog bite to the face and to assess the effects of victim age and gender and dog sex and size on the location of the bite to the face and the need for medical treatment. Complete data on 132 incidents of bites to the face were analysed.

A human bending over a dog, putting the face close to the dog's face, and gazing between victim and dog closely preceded a dog bite to the face in 76%, 19% and 5% of cases, respectively. More than half of the bites were directed towards the central area of the victim's face (nose, lips). More than two thirds of the victims were children, none of the victims was an adult dog owner and only adult dogs bit the face. Victim's age and gender and dog's sex and size did not affect the location of the bite on the face. People who were bitten by large dogs sought medical treatment more often than people who were bitten by small dogs ($P < 0.01$). Risk factors such as bending over the dog, putting the face close to the dog's face and gazing between human and dog should be avoided, and children should be carefully and constantly supervised when in the presence of dogs.

Introduction

The mutually beneficial relationship between humans and dogs is sometimes overshadowed by bites. Possible injuries range from minor lacerations to fatal wounds (Horswell and Chahine, 2011). Epidemiological studies indicate that the most common victims of dog bite injuries are children (Wright, 1991; Overall and Love, 2001; Ozanne-Smith et al., 2001) and most dogs that bite are familiar with their victims (Gershman et al., 1994; Brogan et al., 1995; Bernardo et al., 2002; Kaye et al., 2009). Among the more serious dog bite injuries are those that occur on the face (Tu et al., 2002). The most serious cases can have cosmetic and functional consequences (Mcheik et al., 2000). The incidence of bites to the face is associated with victim's age; children are mostly bitten on the face, whereas adults are usually bitten on the limbs (Morgan and Palmer, 2007).

In order to develop an effective preventative program, it is necessary to recognise which interactions between humans and dogs are likely to result in a bite injury (Mathews and Lattal, 1994; Mills and De Keuster, 2009). Although the literature on dog bites to humans is extensive, little or no research has been conducted on the behavior of both human and dog during most incidents (Love and Overall, 2001; Reisner et al., 2007). Similarly, we are poorly equipped to draw any conclusions about what triggers bites to the face (De Keuster and Overall, 2011). The objectives of the present study were to determine human behavior immediately preceding a dog bite to the face when other parts of the body were not bitten and to identify the location of the bite on the face. The effect of victim's age and gender and dog's sex and size on the location of the bite on the face and whether medical treatment was sought were assessed simultaneously.

Materials and methods

Data collection

Participants were recruited via fliers that were posted in local veterinary practices and dog shows in Moravia (Czech Republic). All cases where dogs only bit the face but not other parts of the body were included in the study. Data on dog bites to the face were collected from January 2012 to June 2014 from dog owners, children's parents, and victims who voluntarily contacted our department seeking an explanation for this undesirable behavior. At the time of the dog bite consultation, all participants were asked to complete a questionnaire that was divided into two sections: (1) victim and dog characteristics, and (2) victim and dog behavior. The questionnaire was pre-tested with 12 subjects not included in this study, and after a few minor modifications, was explained to the participants. At the time of the consultation, every participant had completed the questionnaire. An experienced interviewer assessed the completed questionnaire. Direct enquiries were made to the participants when data were missing. Fourteen questionnaires were excluded because of incomplete data.

Victim and dog characteristics

For each incident of a bite to the face, gender of victim (male, female), age of victim (child, <18 years; adult, ≥18 years), breed of dog (specific breed, cross-breed), age of dog, sex of dog (male, female), size of dog (small, medium, large), familiarity between victim and dog, location of the incident, presence of the child's parent and dog owner, location of the bite on the face (nose, upper lip, lower lip,

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http://dx.doi.org/10.1016/j.tvjl.2015.10.021
1090-0233/

chin, cheek, forehead, eye area), whether medical treatment was sought and whether only the soft tissue of the face was injured were recorded. Four male dogs and one female dog were neutered.

Dogs were classified as pure breeds based on the Fédération Cynologique Internationale (FCI) breed standards categories. Pure breeds were identified based on a photo that was shown by the interviewer to the victim/owner, who chose the breed. The remaining dogs were classified as crossbreeds. Dogs were classified as small (<30 cm), medium (30–50 cm) and large (>50 cm) based on the height at the withers as specified in the FCI breed standards. In breeds for which the height at the withers was not specified in the FCI breed standards and in crossbreeds, the size was classified subjectively based on the description of the dog. Adult dogs were >9 months of age in small breeds, >12 months of age in medium breeds, and >16 months of age in large breeds (Pineda and Dooley, 2003).

Bites were divided by familiarity of the victim with the dog into three groups: (1) familiar people who lived permanently with the dog for at least the preceding month (owners and other members of the household where the dog lived); (2) familiar people who did not live permanently with the dog, but came into contact with the dog at least once weekly for at least the preceding month; and (3) other people who were classified as unfamiliar. Bites were categorised by location into two groups: (1) in the dog's home, yard, garden and surrounding area, or (2) outside those places. The location of the bite on the face was classified into two groups: (1) on the central area on the face (nose, upper lip, lower lip), or (2) external area on the face (chin, cheek, forehead, eye area). Victims were also categorised into two groups based on whether they sought medical treatment or not.

Victim and dog behavior

The part of the questionnaire that covered the behavior of victims immediately preceding the bite was developed from 2007 to 2011 based on discussions with dog owners who witnessed a dog bite to the face. Preliminary analysis suggested that a human bending over a dog, putting the face close to the dog's face, or gazing between dog and human might trigger a dog bite to the face. In addition, some behaviors reported in published studies of dog bites (Reisner et al., 2007; Cornelissen and Hopster, 2010) were included in the questionnaire. This list of additional circumstances in which dogs might bite was from a clinical canine patient population where dogs were presented for an aggression complaint. For each incident, one of the last behaviors displayed by a victim immediately before a dog bite to the face was indicated, i.e. bending over a dog, putting the face close to the dog's face, gazing between dog and victim, stepping on a dog, pulling the dog's hair or body, falling on a dog, punishment by hitting, scolding a dog, or trimming the dog's nails.

Displaying one of the following signs was classified as a threat: growling, curling the lips, baring the canine teeth, or snarling (Rezac et al., 2011). For each incident, participants were asked to indicate whether the dog showed a threat immediately before the bite to the face.

Statistical analysis

Statistical evaluation of the data was performed using the SAS software (SAS Institute). Complete data on 132 incidents of bites to the face were used for analysis. Frequencies of occurrence of particular characteristics and behavior were expressed as percentages. The effect of the victim's age and gender and dog's sex and size on the location of the bite on the face and whether medical treatment was sought was analysed using the chi-square test. Results were considered to be statistically significant at $P < 0.05$.

Results

A human bending over a dog, putting the face close to the dog's face and gazing between human and dog immediately preceded a dog bite to the face in 76%, 19% and 5% of all cases ($n = 132$), respectively (Table 1). Victims did not step on the dog, pull the dog's hair or body, fall on the dog, punish the dog, scold the dog, or trim the dog's nails immediately before any of the incidents of bites to the face. The proportion of male and female victims was 40% and 60%, respectively. The mean age (±standard error, SE) of the victims was 15.4 ± 1.2 years. Children and adults were bitten in 70% and 30% of cases, respectively. Eighty-four percent of all bitten children were <12 years old. The children were bitten on the face in the presence of their parent in 43% of cases and in the presence of the dog owner in 62% of cases. Familiar people who did not live permanently with the dog were bitten in 40% of cases. Household members were bitten by their dog in 39% of cases. None of the victims was an adult dog owner.

Table 1
Data collected for 132 dog bites to the face.

Data	*n* (%)
Victim behavior preceding dog bite	
Bending over a dog	100 (76)
Putting face close to dog's face	25 (19)
Gazing between human and dog	7 (5)
Victim's gender	
Male	53 (40)
Female	79 (60)
Victim age	
Child (<18 years)	92 (70)
Adult (≥18 years)	40 (30)
Presence of parent with child	
Present	40 (43)
Not present	52 (57)
Presence of dog owner with child	
Present	57 (62)
Not present	35 (38)
Familiarity between victim and dog	
Familiar people who lived permanently with the dog	51 (39)
Familiar people who did not live permanently with the dog	53 (40)
Unfamiliar people	28 (21)
Dog's sex	
Male	90 (68)
Female	42 (32)
Dog size	
Small	43 (33)
Medium	25 (19)
Large	64 (48)
Location of incident	
Dog owner's home, yard and garden	105 (80)
Public areas	27 (20)
Location of bite on face	
Central area on face (nose, lips)	70 (53)
External area on face (chin, cheek, forehead, eye area)	62 (47)
Sought medical treatment	
Sought treatment	65 (49)
Did not seek treatment	67 (51)

Male and female dogs caused 68% ($n = 90$) and 32% ($n = 42$) of the bites to the face, respectively. In all cases, only adult dogs bit the face. The mean age (±SE) of dogs was 5.9 ± 0.2 years. Small, medium and large dogs bit the face in 33%, 19% and 48% of cases, respectively. Dachshunds and German shepherds bit the face in 15% and 11% of the cases in this study, respectively. These two breeds are also two of the most common in Moravia (Czech Republic). No other breeds were responsible for >4% of the bites to the face. Dogs that bit were on or off a leash in 5% and 95% of cases, respectively. Bites to the face occurred in the home, yard and garden where dogs lived in 80% of cases. People reported that dogs displayed one of the threats listed prior to the bite to the face in 6% of cases.

Victims were bitten on the central area of the face (nose, lips) and external area of the face (chin, cheek, forehead, eye area) in 53% and 47% of cases, respectively. Victim's age and gender and dog's sex and size did not affect the occurrence of central and external bites on the face (Table 2). People who were bitten had soft tissue injuries to the face.

Victims sought medical treatment in 49% of all cases. People who were medically treated had a puncture wound, laceration and tissue avulsion in 17%, 60% and 23% of cases, respectively. People who were not medically treated had a bruise, puncture wound and laceration in 30%, 33% and 21% of cases, respectively; the remaining 16% of people who were not medically treated were uninjured. The size of the dog was associated with whether the victim sought medical treatment (Table 3); people who were bitten by large dogs sought medical treatment more often than people who were bitten by small dogs ($P < 0.01$). The victim's age and gender and dog's sex did not affect whether the victim sought medical treatment.