

# Injuries due to human and animal aggression in humans

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Łabęcka M, Lorkiewicz-Muszyńska DE, Przysańska A, Kondrusiewicz K. Injuries due to human and animal aggression in humans. *Ann Agric Environ Med.* 2013; 20(1): 91-95.

## Abstract

**Introduction.** People breed animals, professionally take care of them, and work with them. To live with animals, however, it is necessary to know their behaviour and habits, as well as fears. Ignorance of this knowledge may lead to tragedy for the victim (a person), as well as for the beast (animal). Then, nobody cares whether the animal behaved itself or not in accordance with its nature.

**Objective.** The aim of the presented study is to compare the rate of animal aggression in relation to cases of documented aggression towards humans. The victims were investigated according to the age, gender and types of injuries caused by animal bites.

**Material and methods.** The protocols of autopsies (2,218) and medical-legal examinations (4,569) performed from 2004-2009 in the Department of Forensic Sciences in Poznań were analyzed. The selected data was studied using Microsoft Office Excel 2007 for Windows.

**Results.** Analysis revealed the presence of animal bite injuries in less than 1% of the deceased victims of aggression. The number of individuals who died as a result of animal bites varied from 1-4 a year, and in all cases these were postmortem injuries. Analysis of injuries among surviving victims of aggression showed animal bite injuries were present in 41 out of 4,569 victims, almost equally among males and females. Moreover, in 25 victims the bite injuries recognized as human were found. The majority of animal bites occurred in adults. The medium injuries were the most frequent in the animal bite victims.

**Conclusions.** Animal aggression is a marginal problem considering all cases of aggression towards humans. In contrast to the aggression of humans towards other humans, this is a very rare cause of human death or even major injury.

## Key words

violence, victim, injuries, animal aggression

## INTRODUCTION

Both, humans and animals belong to the same community. The widespread belief is that human beings are superior in nature, having reached the highest stage of evolution. Humans are integral members of the community of life and should participate in but not dominate in the natural environment. Human lives interact with animal lives, and this rule should not be forgotten.

Every single day, humans become victims of assaults by other humans, incidental accidents or disasters. Every single day, animals die through being struck by vehicles, killed by humans, or other animals. These everyday events are present throughout our lifetime and are most often are passed over unnoticed. What changes how this situation is dealt with is when a human is attacked by an animal. The information is repeated, the media publicizes the facts, and enriches them with presumptions and conclusions, thereby increasing the general hysteria.

A single animal frequently attacks the victims of animal aggression. In the case of the most popular domestic animal, the dog is usually the aggressor.

Animal behavioral studies have proved that the occasional flare of aggression is demonstrated as a natural response to the individual feeling endangered. The sense of security is a basic need in every individual and is essential for psychological and physical balance. This includes food, the sexual partner, territory with a sleeping area, and developmental and survival possibilities. The individual's sense of security is a congenital need independent of the individuals' characteristics [1].

It has to be emphasized that Canidae and Equidae are flight animals that rely on running as their primary defence, which is a natural and instinctive reaction [1].

The different types of aggression represented by a single animal can be distinguished for practical purposes:

1. Competitive aggression (as the result of dominance hierarchy) appears as an attempt to acquire hierarchical privileges, which is characterized by three sequences: a) threat, b) controlled attack, c) appeasement. If a human is the victim, the controlled bites affect the arm, hand, face, lower limbs, and sometimes the posterior neck.
2. Predatory aggression (hunting and capture of prey) is directed towards other unknown animals (rarely towards humans).
3. Self-defence aggression appears as the result of: a) fear – in a physically or mentally inescapable situation, b) irritation provoked by pain, frustration, hunger or isolation, c) territorial defence – to prevent the intrusion of dogs or people into group territory.

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Received: 4 April 2012; accepted: 20 December 2012

4. Maternal aggression – expressed by a lactating female dog taking care of her puppies [1].

The aggression from dogs in a pack is different and follows group behavior instead of individual behaviour. The dogs stimulate and provoke each other, which results in increased aggressive behavior, often inadequate to the conditions [2]. Thus, the behaviour of dogs in a pack can be compared to a gang of hooligans.

Animal aggression is the result of trauma characteristically typical for particular species. Bites are the most frequent injuries observed in the victims of animal aggression. Apart from animal bites, human bites are also observed in victims. The external form of a bite injury is usually the bite mark of the teeth appearing as numerous penetration wounds. In some cases, these wounds are accompanied by lacerations and avulsions. Based on the characteristics of the bite marks, identification of the species or an individual may be performed [3]. Moreover, the typical victim of animal aggression presents with bruises, abrasions, contusions, and claw or feeding marks (in the case of deceased victim). Other clues left by animals, e.g. hair or excrements may also be found.

The most common bite injuries are dog bites, followed by cat bites and then human bites [4].

## OBJECTIVE

The aims of the study were as follows:

- 1) to evaluate the number of animal aggressions, including cases of death;
- 2) to investigate the prevalence of animal aggression in relation to the different kinds of aggression evaluated;
- 3) to analyze the victims of aggression according to gender, age, and types of injuries;
- 4) to compare the total number of animal versus human bite victims.

## MATERIAL AND METHODS

The analysis consisted of 2,218 autopsy protocols and 4,569 protocols of medico-legal examinations performed in the Department of Forensic Medicine at the University of Medical Sciences in Poznań from 2004-2009. Cases with animal bite injuries were selected from the protocols. Data was analyzed according to particular categories (type and severity of bite, gender and age of the victim) using Microsoft Office Excel 2007, and shown in Tables and Graphs.

It must be emphasized that the information collected was based on the cases reported or submitted to the department, either directly by a victim or legally by law enforcement officials. Overall, the occurrence of animal aggression is probably more frequent and includes cases never reported for medico-legal examination.

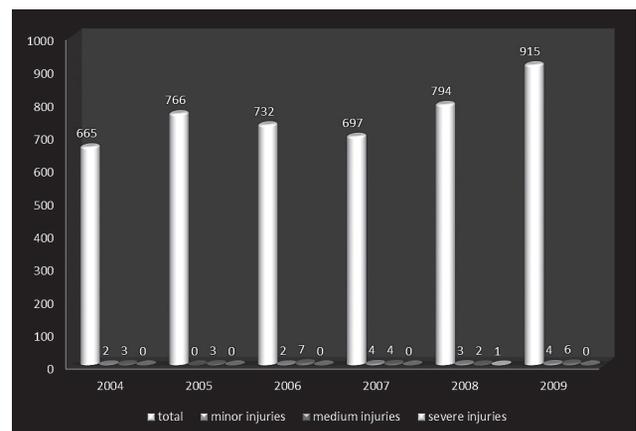
## RESULTS

During the study period (2004-2009) in the Department of Forensic Medicine in Poznań, 2,218 autopsies were performed. Analysis revealed the presence of animal bite

injuries in 18 of all the victims of aggression (0.81%) (Tab. 1). All the bite marks found were of the postmortem type. The characteristics of the bite marks showed that the dogs or small rodents had bitten the bodies. During the study period, no deaths occurred due to animal aggression. The number of deceased people with animal bites found during autopsy in particular years was comparable and did not exceed 4 cases in a year (Fig. 1).

**Table 1.** A total number of autopsies in years 2004-2009 and number of deceased with animal bite injuries

Year	Number of autopsies			
	Total		with animal bite injuries	
	n	%	n	%
2004	379	100	4	1.05
2005	395	100	4	1.01
2006	392	100	0	0
2007	297	100	2	0.67
2008	389	100	4	1.02
2009	366	100	4	1.09
Total	2218	100	18	0.81



**Figure 1.** A total number of autopsies in years 2004-2009 and number of deceased with animal bite injuries

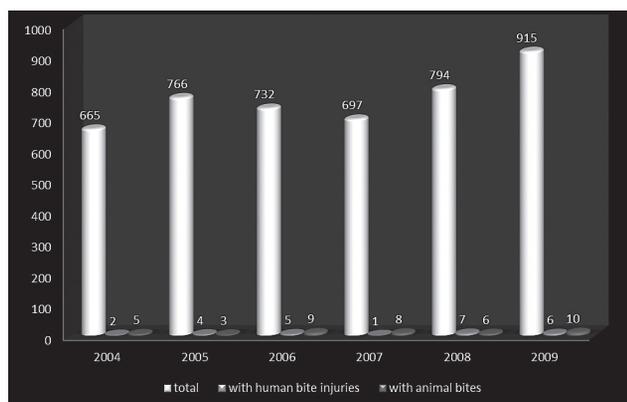
During the investigated period (2004-2009) in the Department of Forensic Medicine in Poznań, 4,569 medico-legal examinations were performed. The protocols documented the presence of animal bite injuries in 41 (0.89%) victims. The number of victims with animal bite injuries varied from 3-10, but never exceeded 1.5% of all cases (Tab. 2). Apart from the animal bites injuries, the investigation showed the presence of human bite injuries. Human bites were found in 25 (0.54%) victims (Tab. 2).

Analysis of the victims according to gender showed that the number of female and male victims of animal aggression was comparable and reached 21 (51.22%) cases and 20 (48.78%) cases, respectively (Tab. 3).

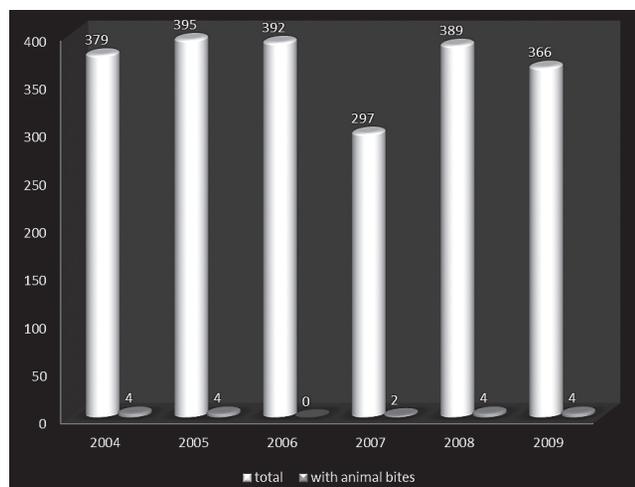
The majority of animal bites occurred in adults (30 cases), in contrast to only 11 in children. Analysis of the severity of injuries showed that the total number of minor injuries caused by animal bites was 15. In 25 cases, medium injuries were found, whereas only one case had major injuries (Tab. 4).

**Table 2.** The comparison of number of victims with human bite injuries and animal bite injuries

Year	Number of the medical-legal examinations					
	Total		With human bites		With animal bites	
	n	%	n	%	n	%
2004	665	100	2	0.30	5	0.75
2005	766	100	4	0.52	3	0.39
2006	732	100	5	0.68	9	1.23
2007	697	100	1	0.01	8	1.15
2008	794	100	7	0.88	6	0.76
2009	915	100	6	0.65	10	1.09
Total	4569	100	25	0.54	41	0.89

**Figure 2.** The comparison of the number of victims with the human bite injuries and animal bite injuries**Table 3.** The relation of the number of animal bite injuries and the sex of the victim

Year	Number of the medical-legal examinations	Male	Female	Number of victims	%
2004	665	1	4	5	0.75
2005	766	3	0	3	0.39
2006	732	5	4	9	1.23
2007	697	3	5	8	1.15
2008	794	4	2	6	0.76
2009	915	4	6	10	1.09
Total	4569	20	21	41	0.89

**Figure 3.** The subdivision of animal bites injuries according to the classification of injuries' types in accordance to the Criminal Code**Table 4.** Subdivision of animal bites injuries according to classification of types of injuries in accordance with the Criminal Code

Year	No. of medico-legal examinations	Minor injuries	Medium injuries	Severe injuries
2004	665	2 0,30%	3 0,45%	- -
2005	766	- -	3 0,39%	- -
2006	732	2 0,27%	7 0,95%	- -
2007	697	4 0,57%	4 0,57%	- -
2008	794	3 0,37%	2 0,25%	1 0,12%
2009	915	4 0,43%	6 0,65%	- -
Total	4,569	15 0,32%	25 0,54%	1 0,02%

## DISCUSSION

The presented study was inspired by an accident that occurred in Poznań in 2003. A several-months-old female infant was left outside in the yard and was bitten by a Rottweiler. While the child was crying, the dog emerged from an unsecured dog pen, and with the child held in its jaws, took the crying child from the yard. The infant died because of severe craniocerebral injuries. The dog, recognized as an aggressor, was put down humanely.

Similar cases were examined in the Department of Forensic Science in Kraków. The first to be investigated was that of a 68-day-old male infant whose dead body was found in a yard. A sleeping bag and a diaper were stained with blood. During postmortem examination, a wide bruise over the left knee joint, superficial bruises of upper extremities and the left side of the head were found. The parents admitted to drinking alcohol during the day of the incident. The infant had been left in the yard at 21:00 and been found dead at midnight.

The next case was that of a 20-days-old male infant who had been left asleep at home by his mother for 20 minutes. The infant was in the company of three female adult German Shepherds (a mother and two daughters). Upon her return, the mother found the body of her child lying on the floor and being mauled by her dogs. The dogs were chased away without showing any aggression towards the owner. The dogs, recognized to be aggressors, were put down humanely [5].

All cases of tragic dog attacks on children have highlighted the problem of human directed aggression in dogs. Every single manifestation of dog aggression appears to increase the fear among the population, escalated by the media creating the image of pet dogs as 'beasts'. As the population of both humans and dogs increases, understanding why dogs attack is important considering how many millions of dogs live among people.

However, in the above-cited cases, pet behaviorists can easily explain the 'aggression' of the dogs. The 'aggression of the mother' was the reason for the Rottweiler attacking the infant. The dog had moved the child as a canine mother moves its puppy. That was not aggression. It was the natural instinct of a mother to care for an offspring in need. The third case is an example of 'catching aggression' among dogs acting in a pack to devour their prey [1]. Thus, in the opinion of the authors of the presented study, the humane putting down of dogs demonstrating their natural behavior was unjustified. The parents of the children are the ones who should be severely punished for creating the circumstances which ended in tragedy. In all cases, the court sentenced

the parent's judgments. These were people who showed woefully inadequate knowledge of animal behaviour, and who themselves created the dangerous situations resulting in deaths of children.

Many authors have discussed the real causes behind dog aggression, and have studied the influence of age, gender, reproductive status and breed on the aggressive behaviour of dogs kept as household pets [6, 7]. The term 'behavior problem', is used to describe any behaviour shown by an animal which is unacceptable to the owner [8, 9]. In this task, behaviour problems are common in the domestic dog population. The main behaviour problems reported by owners was excessive activity, inappropriate elimination, fearfulness, aggression towards strangers, and destructiveness [10]. A wide variety of reasons, including, for instance, genetic predisposition, negative previous experiences and dietary protein content [11] are reported as reasons for excessive activity in dogs. Analysis of the predictors have revealed their significant influence for aggressive behaviour. It is believed that dog behaviour is partly the result of its innate qualities, but more importantly the training provided by the owner. The owner tolerance of significant degrees of aggressive behaviour, inadequate or ineffective obedience training, and biting of adult household members can influence the behaviour of a dog [12].

One study [13] showed that the connection between lunar cycles and changes in animal behaviour, and the propensity for animals to bite humans accelerates sharply during the full moon. It has been estimated that the risk of being bitten also varies with the age of the human victim. Bites are more frequent in people aged between the years of 2-19 [14]. Children have the highest risk of death. Provocation of dogs by teasing or by unintentionally threatening behavior by children was suggested as a precipitating factor in many attacks [14]. Dog bites most often affect the extremities [15, 16, 17, 18], and young children most often sustain bites from their family dog in their own homes. Injuries typically involve severe facial lacerations. It is reported that prevention strategies for young children, including close supervision of child-dog interactions are recommended [19]. Educating children about dog bite prevention successfully teaches children the safe behaviour of a dog [20].

Evidence suggests that most incidences of human directed aggression in dogs occur within the home environment and towards family members or those known to the dog [21]. For example, 62% of bite incidents in a survey in the Netherlands took place in non-public areas [22].

The performed study estimated that the majority of dog bite victims included people unfamiliar to the dog, most often occasional passerby. According to Polish law, dog leads are mandatory for walks (Art. 77 of the Petty Offences Code) [23]. The victims were bitten by dogs running free in close proximity to the owners, or by dogs that escaped from inadequately protected properties. In some cases, the dog's aggression was induced by the owner's command to attack the person passing by.

It is welcome and possible to reduce the number of incidents of animal aggression. If a person complies with the rules and regulations and is made aware of just the minimum knowledge about animal behaviour, then dangerous situations could be avoided. Animal aggression against people could be eliminated, thereby contributing to a significant decrease in the overall number of individuals bitten. Additionally, irresponsible dog owners should be punished accordingly.

It is estimated that a half of all Americans will be bitten by either an animal or another human being during their lifetime [24]. Human bites are the third most common type of mammalian bite, accounting for up to one quarter of bite wounds examined by urban physicians [25, 26, 27]. Most human bites result from overtly aggressive behaviour. However, accidental bites associated with sports, school-related activities and sexual activity also occur [24, 25]. Male victims are most often bitten on the hand, arm, and shoulder. Female victims are most often bitten on the breast, genitalia, legs, and arms [24, 28].

Despite an attempt to compare the number of animal and human bite victims in other Polish cities, the statistical data for analysis were not obtained. Unlike many countries (Netherlands, Germany, USA, and Canada), Poland suffers from a lack of studies of victims of bite marks, followed by statistical analysis. The only place in Poland collecting data of this type is the University of Medical Sciences in Poznań. The Department of Forensic Medicine registers the victims, but there is a need for a common database or a national reporting system to fully monitor the number of fatalities. The risk factors surrounding the attack should be considered and analyzed in order to contribute to the implementation of effective prevention.

## CONCLUSIONS

The analysis confirmed the observation that animal aggression is marginal, especially when compared to the aggression of a human against another human. In addition, the investigated protocols showed no deaths due to aggressive animals. In 18 deceased individuals, only postmortem animal bite injuries were found.

Each of the 111 people examined in the Department of Forensic Sciences reported because of injuries caused by animal bites. The total number of examined victims of animal aggression was 41 (0.89%). There were no significant differences between victims based on gender. Adults are more likely to be attacked by animals than children.

In accordance with Article 157 § 1 and 2 of the Penal Code, the majority of injuries due to animal aggression were classified as medium and minor. In contrast to the aggression between human and human, animal aggression is a very rare cause of human death, or even of major injury.

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