INTRODUCTION

Most studies on dog bite incidents are carried out in the United States where dog bite injuries are the childhood public health problem most frequently reported [1]. Injuries from dog bites may cause a number of physical problems (e.g. eyesight, breathing, nutrition) and psychological problems due to the physical scars resulting from such injuries [2]. Dog bites cost over $1 billion a year, with insurance companies paying out $250 million in liability claims as well as the cost of euthanasia of dogs that have been given up to shelters or abandoned because of biting accidents. In addition the emotional consequences of pet loss following such incidents should not be underestimated.

VICTIMS

Review of publications

Studies carried in different countries report that children are the most frequent victims of dog bites. A number of studies agree that children between 5 and 9 years of age are the most frequent victims [2, 3, 4], although some report that the highest rate of serious injury from dog bites is to children under 5 years of age [2, 5, 6]. Boys are more frequent victims compared to girls with the most frequently injured areas being the face and legs. Dog owners are more at risk of being bitten [5, 7].

Review of data provided by different European National Databases

The Health and Consumer Protection Directorate General of the European Commission introduced The European Home and Leisure Accident Surveillance System (EHLASS) in 1986 to foster a consumer protection and product safety policy. This provides information about victims of home and leisure accidents treated at emergency departments of hospitals in different European countries. The data presented here represents the year 1998 as it is the only year in which all the following countries provided data on injuries related to dogs: Austria (AT), Belgium (BE) Denmark (DK), Spain (ES), Finland (FI), France (FR), Ireland (IE), Italy (IT), Portugal (PT), Sweden (SE) and United Kingdom (UK).

Children under 14 years of age are the most frequent victims of accidents caused by dogs (Figure 1).

Fig 1: Percentage of victims of injured caused by dogs in 1998, sum of data from 11 countries

Under 45 years of age, males seem to be slightly most at risk but females over 65 are more likely to have an accident caused by a dog than males. This could be due to the fact that after reaching 65, women are more likely to own dogs than men.

The location of the injuries varies depending on the age of the victim. Children under 14 are injured mainly on the head and face followed by arms/hands and legs/feet. Victims over 14 are injured mainly on their arms/hands followed by legs/feet and head/face (Figure 2). For all ages the trunk is the least exposed to injury.
There are an estimated 6.5 million dogs in the UK. By dividing the number of dog bite accidents in the UK by the number of pet dogs it appears that one dog out of one hundred has been involved in a biting incident. This figure does not take into account the fact that one dog may have been involved in more than one incident. If we compare this number to other accidents we see that the chance of being bitten by a dog is only 10 times less than having a car accident in the UK [8].

**Limitations**

The main aim of the European EHLASS was to create a common database with quality data collected using a common classification and comparable methods. However they have not yet succeeded as each country has a different method of collecting the data and a standard method of collecting information on this type of injury in Europe would be very useful to compare the trends in the different countries. It would be useful if each country had a method for recovering the necessary information on accidents caused by dogs as currently each country collects different types of information but none has a fully effective database on these injuries with a sufficient number of hospitals to collect the data. Such a database should include the calculation of national estimates and the collection of all the following data: age of victim, body part injured, circumstances of the accident (e.g. location, known/own dog), type of treatment, time spent in hospital, and the distinction between accidents caused by a dog biting a person and other types of accidents caused by dogs. When looking at this type of data one must always take into consideration the differences in the methods of collection to avoid confusion. Such differences can result into the total number of victims being up to 10 times higher depending on the source of the data.

However, independent of the method of collection, the majority of sources agree that young children are more at risk and are bitten on the face/head in a familiar environment.

**WHY CHILDREN**

One step to reduce dog bite incidents is to try to understand why these accidents happen. It is generally suggested that dog bites are a result of people’s misinterpretation, or lack of understanding, of dog’s communicative signs. For example, when a dog presses its paws on human’s shoulders people often anthropomorphically call this a hug, however in communication between dogs such behaviours are often challenges (Figure 3). Few studies have been done to assess people’s understanding of dog behaviour. Millot and Filatre (1986) [9] analysed videos of spontaneous actions between children (2-5 years) and their pet dog. They found that the children were the ones taking the initiative for most of the interactions. There also seems to be a difference between the type of interaction children between 2-3 years of age have with a dog, essentially agonistic type interactions, and children between 3-4 years who show more appeasing and linking behaviour and children between 4-5 years, who also show more non-agonistic body contacts with the dog [10].

**How do children interpret dog behaviour?**

To answer this question the following study was carried as part of PhD thesis. The aim was to assess the understanding of children with respect to certain dog behaviours. This study involved interviewing 430 schools children between 4 and 10 years of age in Italy, Spain and Scotland. Each child was individually shown short videos of dogs of different breeds depicting various body postures to investigate how they interpret the behaviour of the various dogs and what they look at to make their decision.

The results showed that children under 4 years of age were less good at interpreting the behaviour of the dog, especially for friendly and fearfull dogs. They looked more at the face of the dog in order to make their decisions and less at the movements and postures of the dogs. Older children did the...
opposite and the tendency to look more at the movements and less at the face increased gradually as children got older.

The body language of dogs is not the same as humans, facial expression is not an important part as it is in humans. By looking more at the face of the dog rather than at its posture children can easily be misunderstand what the dog is trying to communicate to them. This is particularly dangerous when a child is confronted with a fearful dog: the child sees a nice looking dog and wants to hug or pet it, but the dog is scared or anxious and might respond by biting as a defence mechanism.

Approximately 10% of these 430 school children had been bitten by a dog and most of them had the accident between the age of 3 and 5 years old. Most of the victims were bitten by a familiar dog, which again supports the findings cited above.

PREVENTION PROGRAMMES

In 2000 two studies tested a bite prevention programme, one in the USA [11] and another in Australia [12]. The study in the USA tested second to fourth grade primary school students (7-9 years old) with the BARK (Be Aware, Responsible, and Kind) Dog Bite Prevention Programme was based on written educational materials, video and questionnaires. This programme appeared to be highly effective in helping children understand how to prevent or avoid potentially threatening situations involving dogs.

The study in Australia consisted in a 30 minute intervention by a dog handler and a dog demonstrating to 7-8 years children how to behave around dogs, such as how to recognise friendly, angry, or frightened dogs. Seven to ten days after participating in the programme, children were let out to play unsupervised in the school grounds, where a docile Labrador dog was tethered. Children who had received the intervention displayed appreciably greater precautionary behaviour than children who had not received any intervention.

In 2003 another prevention programme tested in Australia [13] investigated parents’ beliefs about their children’s behaviour around familiar and strange dogs, and evaluated the impact of a brief educational dog safety programme on kindergarten children. The data revealed that many children engage in unsafe behaviours around dogs and that parents are largely unaware of the dangers associated with such behaviours. The dog safety programme resulted in a significant increase in the ability of children to identify high risk situations for up to eight weeks, with the benefits being even greater in those children whose parents were also given information regarding safe behaviours around dogs.

CONCLUSION

Various sources have shown children are more likely to be bitten and suffer from more serious injuries. In addition younger children are less good at reading and understanding the behaviour of dogs. All these factors indicate that children, especially younger ones, need to be educated on how to behave in the presence of dogs. The earlier a person learns how to behave around dogs, the less he/she will be likely to be bitten.

ACKNOWLEDGMENTS

N.L was funded by the Veterinary Faculty of Milan University.

Grateful thanks to:
All the schools in Scotland, Italy and Spain.
Dr Xavier Manteca, Dr Nuria Calzada and Mrs Xesca Grau who helped me in Barcelona.
Dr Gwyneth Doherty-Snaeddon for her advice on child psychology.

All the behaviourists who had a look at the videos at the locations indicated in the paper.

And last but not least the FECAVA and particularly Dr Tiny De Keuster for inviting Nelly Lakestani to the FECAVA Symposium.

REFERENCES