

Survey of knowledge of school children towards the prevalence, severity, management of maxillofacial injuries, and rescue skills in the event of a dog bite

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ABSTRACT

Background: Maxillofacial injuries are reported commonly in children encountering animal/dog attack. The level of knowledge of children on such events can form a sound basis for the prevention of maxillofacial injuries resulting from dog bites/attacks. **Aim:** This study aims to assess the knowledge of children on maxillofacial injuries resulting from dog bites, their management, and rescue skills to be used during the event of a dog attack. **Settings and Design:** The study is a cross-sectional questionnaire survey. **Material and Methods:** Seven hundred children aged 7–12 years participated in the study. A questionnaire consisting of 21 questions assessed the common site and management of injury resulting from dog bites, the source of exposure, and the knowledge of children on rescue skills to be used in the event of dog attack. This was followed by an awareness program to educate the children on rescue skills and management of dog bite injuries. **Statistical Analysis:** Descriptive statistics were calculated for all the variables. **Results:** A significant percentage of dog bite injuries occurred on the face and hands in children. Boys were more common victims. Familiar dogs inflicted injuries to the children commonly than stray dogs. The children lacked knowledge on the management of dog bite injuries; however, they were aware of rabies and its prevention. The children were not well aware of rescue skills to be used in the event of a dog attack. **Conclusion:** Children are innocent and behavior of dogs are unpredictable hence they become victims of the dog attacks. Educating children on safe animal behavior can prove vital in reducing gruesome maxillofacial injuries resulting from dog attacks.

KEYWORDS: Children, dog bite, maxillofacial injuries, rescue skills

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Introduction

Maxillofacial injuries from dog bites can vary from simple abrasions to tear or avulsion of a portion of soft tissue or sometimes even facial fractures.^[1,2] The prevalence of dog bite injuries in children may vary from 13.8% to 68% in urban, suburban, and rural areas.^[3,4] Some countries are unable to project an annual incidence of dog bite record due to the absence

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of a standardized national reporting system. The most common area to be inflicted by dog attacks in children is the face as it is at the same level as the mouth of the dogs.^[5,6] The location of injury depends on the accessibility and height of the child, as the child grows the accessibility to a bite injury shifts from head to face, neck, and to extremities.^[7,8]

A literature review of risk population by various authors in the past reported that schoolchildren were at a higher risk for dog attacks.^[4,9,10] Children become easy victims of animal attack due to lack of knowledge of animal behavior as well as the lack of knowledge about rescue skills. Hence, this study was conducted to assess the knowledge of schoolchildren toward the prevalence, severity, management of maxillofacial injuries, and rescue skills in the event of a dog bite.

Materials and Methods

We conducted a cross-sectional self-reported questionnaire study. A total of 700, 7-12-year-old children, in and around Udupi district participated in the study. A total of six (three government and three private schools) were selected. Prior permission to conduct this study and demonstration was obtained from school authorities. All the children present on the day of survey were invited to participate in the study and demonstration. As this study involved a training session, all the students in the schools were included to make up this convenient sample.

All the children were given a 21-item self-administered close-ended questionnaire to assess their awareness and experience of dog attacks and dog bite injuries [Figure 1]. It had questions aspects, namely, common site of injury from a dog bite, the source of dog bite exposure, attempt and success of any rescue skills used, and management of injuries after an event of a dog attack. Information on age and gender was calculated from all the children.

This was followed by an awareness program which had safe child-dog relationship, management of dog bite injuries, and rescue skills to be used in the event of dog attack. The children were educated with the help of posters that illustrated dog bite injuries, management of these injuries, and rescue skills.

The children were also trained to perform the rescue skills through demonstration and practice session. The rescue skill comprised of two sectors, one "being tree" model to deal with a chasing dog and "curl up into a ball" posture that prevents the dog biting the face, neck, thorax, and abdomen when the child is knocked down [Figures 2 and 3].

Statistical analysis was performed using SPSS version 18, (SPSS Inc, Illinois, Chicago, USA). Descriptive statistics were calculated for all the variables.

1. Do you like animals?
2. What are pet animals?
3. Do you have pet animal/animals at your home?
4. Do you like to play with your pet animal?
5. Do you like to play with pet animals of other owners?
6. Do you take permission of the owner before playing with their pet animal?
7. Do you interact with animals on the street?
8. Can you name some unattended animals on the street that you have seen?
9. Do you know animals can attack you?
10. Can you identify an attacking animal?
11. How do you think an attacking animal can hurt you?
12. Have you been attacked by any animal before?
13. Have you been bitten by any animal?
14. Which animal has bitten you?
15. Where has it bitten you?
16. What did you do when the animal bit you?
17. What did you do the bite wound?
18. Do you know what to do when a dog chases you?
19. Do you know what to do if a dog/animal bites you?
20. Do you know about diseases caused by dog bites?
21. Which disease can occur if a dog bites?

Figure 1: Questionnaire that was given to children to assess their knowledge of animal attack and management of facial injuries

Results

The questionnaire was designed such that the first eight questions were aimed to evaluate the willingness of the children to interact with the animal to evaluate the child-animal relationship. They simultaneously assessed the source and probability of exposure to animal attacks. The ninth and tenth question assessed the awareness of children toward animal attack. The question numbers 12 and 13 evaluated the nature of animal attack whether the child experienced a scratch or bite by the animal that attacked. Question number 14 evaluated the most common type of animal inflicting attacks on children and 15 analyzed the location of injury from dog attacks. While question 16 allowed the children to explain the measures taken after being injured by dog attacks, the question 17 analyzed the management of wound. Question 18 analyzed the knowledge of rescue skills. Question number 19 assessed the knowledge of unexposed children toward the management of wounds and prevention of infectious disease resulting from dog attacks. The awareness of children toward Rabies was evaluated by the questions 20 and 21. The gender of children was identified by the basic information given by the participant in the questionnaire.

Of the 700 children, 72.5% liked animals and 54.8% interacted with dogs more commonly than



Figure 2: Children demonstrating “being a tree” during the practice session at school

other domesticated animals. Although 66.7% of the children had dogs as their pet animal, the children interacted with animals including dogs other than their own pets, which included stray dogs. Of the unattended/stray animals that were found around the children, stray dogs were the most common ones. Most of the children (89.7%) who participated in the study were aware of the capability of the animal/dogs to attack humans. A total of 61.4% of them were able to identify an attacking animal, but 77.3% of them were partly aware of rescue skills.

The study identified that 15.4% of the children were attacked by dogs and 7.3% had sustained bite injuries. Our study revealed that parts of the body that were affected by bite in the order of hand (10.7%), face (4%), neck (0.9%), back (0.4%), chest (1.4%), and shoulder (1.4%).

A total of 74.2% of the children who were victimized by dog attack were given medical care at hospitals. Nearly, two-thirds (62.1%) of the children victimized by dog attack were aware of rabies as an infectious disease inflicted by a dog bite. Although 67.8% of the children were aware of rabies vaccine, only 1.1% were aware of care for wounds caused by dog bites. Hence, emphasizing the need for awareness toward the appropriate management of maxillofacial wounds caused by dog attacks.

Discussion

Animals have been an acceptable part of our social living. Most children appreciate social behavior through interaction with animals too. Animals by virtue of their nature are aggressive and can inflict harm to children, hence safe animal relationship should be nurtured in them.

Our study suggested that dogs were the most common animals to attack children. The most common source of exposure in children is through their own pet dogs, while less commonly also through the dogs from their



Figure 3: Children demonstrating “curl up into a ball” during the practice session at school

neighborhood and stray dogs. These findings were in agreement with other existing reports on dog bites in pediatric population which suggested that 43% of dog attacks arise from child’s own household.^[11] Reports of some studies suggested that more than half of the incidence of dog bites occurred in children <12 years of age. The second peak of incidence was in children of 2–5 years.^[3,12] The literature suggested that the age of children was closely associated with the location of the injury, the face being the common site for a dog attack in children of 2–5 years, whereas the thorax and upper extremities become a common site in children 6–12 years of age.^[5,8,10,12,13] The results of our study were in agreement with these findings on the location of the injury correlated to the age of the children. Since the children who participated in our study were 7–12 year old, the hand was the most common site inflicted by dog attacks than the face. However, more clearly the factors that can determine the location of injury were related to the height of the child, nature of the attack, as well as the height of the attacking dog.

Canines of the various breed can be ferocious and can victimize children severely. The trauma inflicted by dog attacks can vary from simple lacerations to deep wounds to even loss of soft-tissue partly.^[5,6] The saliva of the dog contaminates the wound with a multitude of microorganisms.^[14] The facial bite injuries need to be treated promptly with proper debridement and disinfection to avoid facial disfigurement and sepsis.^[5,10] Elaborate primary care of the wound includes debridement, irrigation, removal of necrotic tissue, primary closure, and secondary reconstruction whenever indicated. This should be supplemented

with antibiotic prophylaxis with a combination of amoxicillin and clavulanic acid to prevent sepsis.^[10,15] Our study evaluated the knowledge of children on the management of maxillofacial injuries and found that most of the children were unaware that the injuries need to be managed locally just as it was important to prevent rabies.

Dog bites are a significant public health issue. Various preventive programs have been developed so far.^[16-20] The effectiveness of programs such as classroom lesson, educational audiovisual aids, education using puppets, and parent-mediated computer-based awareness programs have been fairly successful in educating predominantly 4–6-year-old children on the safe child-dog relationship.^[20] The awareness of the children toward rescue skills as assessed by the data of our study revealed that the knowledge of the children to rescue themselves from a dog attack was limited. The children responded that in an event a dog chases them they are expected to stand still but failed to respond as to how one can protect themselves if they were knocked down by an attacking dog. They were not aware of management of wound resulting from dog bites, although the awareness on rabies and its prevention was well evident. This provided the preliminary data for implementing a preventive program to create awareness about safe dog relationship as well as rescue skills and management of maxillofacial injuries.

Our project in contrast to earlier programs implemented on prevention of dog bite injuries in children targeted 7–12-year-old children, using posters and demonstration followed by practice sessions. Posters were prepared to illustrate dog safety, rescue skills as well as management of maxillofacial wounds resulting dog bites, and medical management to prevent rabies. This was followed by a demonstration of rescue skills and practice session by the children. During the training session, the children were able to demonstrate a satisfactory level of rescue skill. We are of the opinion that true test of skill is when children are able to demonstrate these in a real event of a dog attack. Repetitive reinforcement through mock drills can definitely strengthen the learned skill.

The results of our study can be summarized as follows: boys are more common victims to dog attacks, the dogs familiar to the children inflict an attack more commonly than stray dogs, and maxillofacial injuries are a common type of injuries resulting from a dog attack in children. Similar findings have been reported by from earlier studies.^[5,7,11]

Although enough awareness was evident in the existence and prevention of rabies, children were unaware of rescue skills and management of maxillofacial wounds resulting from dog bites. Any kind of maxillofacial injury, be its superficial laceration

or injury resulting in facial disfigurement, can result in deep psychological impact on children therefore prevention of such injuries is of utmost importance.^[21] Hence, educating children on safe animal relations and rescue skills can prevent maxillofacial injuries resulting from dog bites in children. We as pediatric health-care providers urge that anticipatory guidance should include prevention strategies toward dog bite.

Conclusion

Maxillofacial injuries were common in children due to dog attacks, and the majority of the children were aware that dog bites can cause rabies and that timely vaccines can prevent rabies. Children who participated in the study were not aware of management of maxillofacial injuries resulting from dog bite or its importance. Children were not well informed about the rescue skills to be employed to effectively prevent maxillofacial injuries in the event of dog attack.

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Conflicts of interest

There are no conflicts of interest.

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