

# Frequency, Pattern and Management of Dog Bite injuries in Children in a Developing Country

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## ABSTRACT

**Aims:** To collect and analyze data regarding frequency, pattern, and management of dog bite injuries in children so that it can be reported to health authorities to launch preventive measures plan against dog bite trauma in children and make sure availability of immunoglobulin and vaccine in proper quantity at proper place to prevent its misuse and expiry.

**Study design:** Observational descriptive study.

**Setting:** Department of Pediatric Surgery King Edward Medical University/ Mayo Hospital Lahore.

**Duration of study:** One year from January 2018 to December 2018.

**Methods:** All patients with dog bite injuries admitted through emergency in department of Pediatric Surgery King Edward Medical University/ Mayo Hospital Lahore were included in the study. Demographic data regarding age, gender, mechanism and severity of dog bite trauma and management recorded on detailed Performa. **Results:** During one year period a total of 445 patients with dog bite injuries presented in pediatric surgical emergency. Out of these 37.8% patients were admitted and 62.2% patients with minor injury were discharged on same day after proper wound management and vaccination in emergency department. Majority were males and most common age at presentation was from 4-8 years.

**Conclusion:** As dog bite injuries are preventable so there is need to give education to children and families about preventive measures against dog bite injuries and proper treatment like immunoglobulin and vaccination.

**Keywords:** Dog bite trauma, children, Frequency, management

## INTRODUCTION

Dog bite trauma in children is an important issues leading to significant morbidity. As children are mostly bitten on their face which lead to cosmetics, functional and psychosocial issues<sup>1</sup>. In developing countries dog bite incidence is 100 times higher than developed countries<sup>2</sup>. According to information from the Centers for Disease Control and Prevention (CDC), dog bites are quite common, In fact, approximately 4.5 million people are bitten by dogs each year, with half involve children<sup>3,4</sup>. Dog bite injuries vary from punctured wound to laceration, nerve damage and disfigurement. Dogs account for more than 80% of animal bites treated annually in united states<sup>5,6</sup> and dog injuries a have significant burden on emergency and surgical resources in united states<sup>7</sup>. The report from CDC states that 26% of dog bites in children require medical treatment as compared to 12% in adult<sup>8</sup>. According to WHO, more than 1.5 million dog bite take place each year in Pakistan<sup>9,10</sup>. Our hospital is tertiary care Centre with biggest unit of pediatric surgery (108 bedded) in Pakistan receiving majority of trauma patients with significant proportion of dog bite trauma in children.

The objective of the study was to do retrospective descriptive study about frequency, pattern and management of dog bite trauma in children so that we can report it to higher authorities for launching preventive measures plan against dog bite trauma in children and make sure about availability of immunoglobulin and antirabies vaccine at departments receiving dog bite injured children more frequently.

## MATERIAL AND METHODS

After obtaining Institutional ethical approval all patients with dog bite injuries admitted through emergency in department of Pediatric Surgery K. E. Medical University/ Mayo Hospital Lahore from 1<sup>st</sup> January 2018 to 31<sup>st</sup> Dec 2018 were included in the study. Data regarding Demography, age, gender, site of injury, type of injury, referral area(rural/urban) seasonal association and management was recorded on detailed Performa.

Received on 10-07-2021

Accepted on 23-12-2021

## RESULTS

During the study period of one year a total of 445 patients with dog bite injuries presented in pediatric surgical emergency. Out of these 168(37.8%) patients were admitted and rest of 277(62.2%) patients with minor injury were discharged on same day after proper wound management and vaccination in emergency department (Table 1). Males accounted for 295(66.4%) of patients and females 150(33.6%) as shown in Table 2. Most common age at presentation was ranging from 4 to 8 years 252(56.62%) as shown in Table 3. Majority of cases came from rural areas 291(65.4%) as shown in Table 4. Most of dog bite injuries occurred during summer season from May to August 280(62.92%) as shown in Table 5. Face was the commonest affected site 310(69.66%) as shown in table 6. Lacerated wounds were the most common type of injuries 168(22.92%) as shown in Table 7.

Table 1:

Admitted /discharged	n	%age
Admitted	168	37.8
discharged	277	62.2
Total	445	100

Table 2:

Gender	n	%age
Males	295	66.4
Females	150	33.6
Total	445	100

Table 3 Age distribution

Age	n	%age
Less than 1 year	13	2.92
1-3 year	70	15.73
4-8 years	252	56.62
More than 8 years	110	24.71
Total	445	100

Table 4: Referral area

Areas	n	%age
Rural area	291	65.4
Urban areas	154	34.6

Table 5: Seasonal distribution

Month	n	%age
Jan-April	93	20.89
May-August	280	62.92
Sep-Dec	72	16.17
Total	445	100

Table 6: Sites of injur

Site of injury	n	%age
Face	310	30.8
limbs	94	28.9
Chest	20	23.2
abdomen	13	15.9
Head and neck	8	1.2
Total	445	100

Table 7: Types of injuries

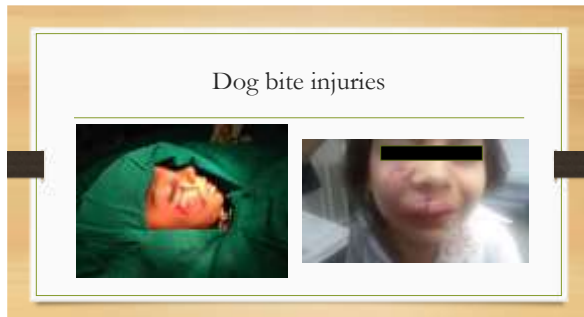
Type of injury	n	%age
Lacerations	300	30.8
Abrasions	280	28.9
Punctured	226	23.2
Bite mark only	155	15.9
Total	973	100

## DISCUSSION

In one year we received 445 patients with dog bite trauma which is quite a large number. It may be due to the fact that our hospital is tertiary care hospital with 2600 beds capacity and paedrs surgery unit is 108 bedded being the biggest unit in Pakistan and more over our hospital is well known for receiving trauma patients as compared to others hospitals in city. In another study during two and half year 158 patients of dog bite injuries in children has been reported<sup>11</sup>. As a developing country ,in our study we found three types of dogs group causing dog bite trauma.one group belongs to street dogs,2<sup>nd</sup> group belongs to pet dogs kept for security purpose and third group of dogs being kept for dog fighting competition festivals. While in developed countries dogs are kept at home as hobby also. As in one study most commonly dog breeds were pit bull, German shepherd and rottweiler<sup>12</sup>. We did not document dog breed in our study. Males were 295(66.4%) and females were 150(33.6%) in our study which is comparable to another study in which males accounted for 60% of the patients<sup>13</sup>. The most common age group having dog bite injuries in our study was between 4-8 years 252(56.62%) which is comparable to another study in which common age was from 5 to 9 years. This may be due to interaction and behavior of children in this age group<sup>12</sup>. Most of patients 291(65.4%) came from rural areas. In another study dog bites from rural areas were 79.4% versus 45.2% from urban areas<sup>14</sup>. This is due to fact that number of dogs especially street dogs are more in rural areas. In our study majority(62.92%) of dog bite injuries presented during summer season (May to August), which is comparable with another study<sup>15</sup>. Due to summer vacation more children are at home and have more exposure to dogs. Face was most common site of injury in 310(30.8%) cases followed by limbs and chest area. Highest proportion of facial site injuries have been reported<sup>6</sup>. In our series Majority of dog bite injuries 277(62.2%) were superficial which were discharged on same day after treatment. In another study 91.1% bites were superficial<sup>11</sup>. Lacerations were in 168(37.75%) cases followed by punctured, bite mark only and abrasions. In another study lacerations were cited most common types of dog bite injuries<sup>12</sup>. The treatment regimen for deep lacerated wound on face which we followed in our patients was wound wash with normal saline, followed by antirabies immunoglobulin 20iu/kg ½ intramuscular and ½ infiltrated around wound followed by primary closure and complete vaccination course as shown in algorithm. While deep laceration on other areas were managed by irrigation with normal saline, securing hemostasis and dressing without wound closure followed by giving immunoglobulin and complete vaccination course. While superficial wounds at face or others areas were washed with normal saline, application of topical antibiotics and referred to vaccination Centre for completion of vaccination course as shown in algorithm. Tetnus prophylaxis, I/v antibiotic and analgesic were also given as part of treatment. Similar treatment has been reported by Bernardo L M<sup>12</sup>.

## CONCLUSION

As dog bite injuries are preventable so there is need to give education to children and families about preventive measures against dog bite injuries. Children should be given education about not provoking dogs and irritating them. Parents should supervise their children especially during summer vacations when incidence of dog bite injuries is more common. There is also need to reduce the number of street dogs in our country and dogs which are kept and grown up at home for participation in dog fighting festivals. Such dog fighting festivals in our country should be condemned and banned to protect animals and human rights especially child rights. There is need for availability of vaccines and immunoglobulin in pediatric surgery emergency for proper management and prevention of sequelae of dog bite trauma in children. There is need to establish national base data hospital wise and accordingly immunoglobulin and vaccination should be



Preoperative

Postoperative



provided in proper quantity at proper place to prevent its misuse or expiry. Proper surveillance of dog bite injuries in children should be done hospital wise

**Limitation of our study** is that it is retrospective study without any long term follow up and deficient documentation in some files especially about minor injuries.

**Strength of our study** is that we are highlighting a public health issue from tertiary care hospital receiving children with dog bite trauma in maximum number than any other tertiary care hospital in the city of 12.64 millions population. In future we are going to do prospective study with inclusion of more variable especially about selection criteria of use of antibiotics according to type and severity of dog bite injuries.

**Conflict of interest:** Authors have no conflict of interest

**Acknowledgement:** Author acknowledged to Emergency Department Sister Rubina for keeping record of dog bite trauma patients in register

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