

## Research Article

# A Case Study of Dog Bite among Children: its Socio-Demographic and Clinical Characteristics in Pakistan

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## ABSTRACT

**Objective:** To determine the frequency of sociodemographic and clinical characteristics of pediatric patients with dog bite.

**Methods:** In this cross sectional study all patients presenting with dog bite aged 12 years or less were included. Patients were divided in two groups according to their age. Patients age, gender, area, interference and familiarity with dogs, number and type of bites and clinical outcome were noted.

**Results:** Dog bites were almost equal in both groups with a male to female ratio of 3:1. Patients were mostly from urban areas and half of bites were from familiar dogs and due to interference by children. Most of wounds were superficial but those with deep wounds developed cellulitis. No case of rabies was noted.

**Conclusion:** Dog bites are common among children with a male predominance. Local wound complications depend on type of wound and post exposure treatment.

**Keywords:** Dog bite, Wound, Vaccination

## INTRODUCTION

Dogs are common pets in most of homes in rural as well as urban areas of Pakistan. Dog bite is a major public health problem globally and is estimated that more than 50% animal bites comprise of bites by dogs.<sup>1</sup> Children constitute a major chunk of dog bite victims.<sup>2</sup> The frequency of dog bite injuries to children is estimated to be 22 per 1000 children out of which less than half are reported to medical facilities.<sup>3</sup> Dog bite injuries in children are associated with functional,

aesthetic and psychosocial consequences as well as local wound infection and rabies if no proper medical care is provided.

There are no large scale studies available in Pakistan regarding incidence of dog bite which is suspected to be very high. In 2010, more than 97 000 recorded cases of dog bites were reported by basic health units alone.<sup>4</sup> These cases do not include those treated at secondary and tertiary health care systems, private clinics and those who

did not report to any medical facility. According to one study it is estimated that approximately 3.6% of emergency department visits by male children between 5 and 9 years old are related to dog bite and most of dog bites occur in patients younger than 15 years.<sup>5</sup>

## METHODS

This observational cross-sectional study was conducted at Pediatrics Department, Aziz Bhatti Shaheed Teaching Hospital Gujrat from January 2016 to May 2016 after approval of ethical committee of hospital. 114 patients aged more than 1 year and less than 12 years were included in study after informed consent of their parents using non-probability consecutive sampling. Patients who were previously treated outside hospital, mentally retarded or having category I wounds were excluded from study.<sup>6</sup> All patients who presented to emergency or OPD with dog bite who met the inclusion criteria were included in study. Age, gender and residential place were noted. Patients was divided in two groups according to age. Group A included patient aged 1-6 years while group B included patients aged >6 - 12 years. Sites of bite, number of wounds and type of wound were also determined. The body was divided in 6 parts for determination of site of wounds i.e head, face, neck, trunk, upper limb and lower limb.

Wounds were classified into 3 categories as determined by WHO.<sup>6</sup> Category I included patients with touching or feeding animals, licks on the skin; category II wounds had nibbling of uncovered skin, minor scratches or abrasions without bleeding and licks on broken skin while category III wounds included single or multiple transdermal bites or scratches, contamination of mucous membrane with saliva from licks of dog.

Familiarity of dog with patient and interference of patient with dog were also enquired.

Time of presentation was divided in 2 categories that is within 24 hours and 24-72 hours after dog

bite. Patients with category II wounds were treated on OPD basis. They were advised to wash the wounds with soap and flush with water and later apply aqueous solution of iodine for 3 days where necessary. These patients were given post exposure rabies prophylaxis with 5 dose intramuscular regimen of Inj. Rabipur 1ml in deltoid region on day 0, 3, 7, 14 and 28. Wounds were monitored and complications were noted on every visit. Patients with category III wounds were admitted in hospital. Their wounds were washed with soap and flushed with water.

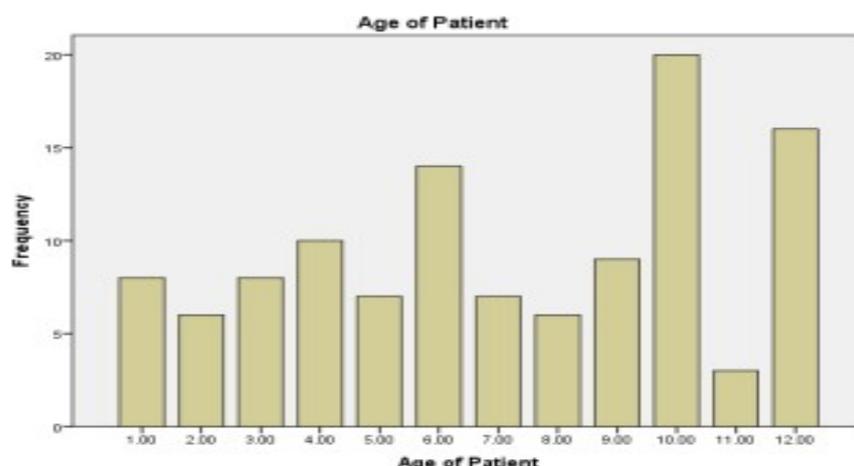
They were given post exposure rabies prophylaxis as described above. None of patients were given rabies immunoglobulin (RIG) due to its non availability and cost. Patients were monitored daily and clinical signs of local infection and rabies were noted daily.

Those who developed fever were considered to have surgical site infection and intravenous weight based amoxicillin plus clavulanate was given. Patients who were symptom free for 48 hours were discharged and called for follow up on OPD basis. Results were expressed as mean  $\pm$  SD for continuous variables such as age and number (percentage) for categorical data such as gender, site of bite, number of wounds, type of wounds etc.

## RESULTS

Out of 114 patients 91(79.8%) were male and 23(20.2%) were female with a male to female ratio 4:1.

Fifty three (46.5%) patients belonged to group A (Age 1-6 years) while 61(53.5%) belonged to group B (Age >6 - 12 years)(Figure 1). Mean age of patients was 7.12 $\pm$ 3.51 years. Majority (69.3%) belonged to urban areas. Fifty Seven(50%) patients were bitten by familiar or pet dogs. In 58(50.9%) patients interference of patient with dogs resulted in bite (Table 1).



**Figure 1.** Dog bite-Age of Patients

**Table 1.** Dog bite-Patient Characteristics

	Group A	Group B	Total
Patients	53(46.5%)	61(53.5%)	114 (100%)
Mean Age	3.83 +1.78 years	9.89 + 1.64 years	7.12+3.51 years
Gender	Male: 41(36%) Female: 2(10.5%)	Male: 50 (43.8%) Female: 11(9.7%)	Male:91(79.8%) Female: 23(20.2)
Area	Urban: 34(29.8%) Rural: 19(16.7%)	Urban: 45(39.5%) Rural: 16(14%)	Urban:79(69.3%) Rural: 35(30.7%)
Type of Dog	Familiar:27(23.7%) Unfamiliar:26(22.8%)	Familiar:30(26.3%) Unfamiliar:31(27.2%)	Familiar:57(50%) Unfamiliar:57(50%)
Type of Wound	Category II: 49(43%) Category III: 4(3.5%)	Category II: 54(47.4%) Category III: 7(6.1%)	Category II: 103 (90.4%) Category III:11 (9.6%)
Interference with dog	Present:21(18.4%) Absent:32(28%)	Present:37(32.5%) Absent:24(21.1%)	Present:58 (50.9%) Absent:56 (49.1%)
No. of sites bitten	1 site: 43(37.7%) 2 sites: 8(7%) 3 sites: 2(1.75%)	1 site: 48(42.1%) 2 sites: 11(9.7%) 3 sites: 2(1.75%)	1 site: 91(79.8%) 2 sites: 19(16.7%) 3 sites: 4(3.5%)

**Table 2.** Frequency of sites of bites

Site	Group A	GroupB	Total
Bite at one site			
Head	1	0	1
Face	5	0	5
Neck	6	0	6
Upper extremity	7	8	15
Lower extremity	24	40	64
Bite at two sites			
Head & neck	2	0	2
Upper &Lowerextremity	1	6	7
Face & head	2	0	2
Face & neck	2	0	2
Trunk &upperextremity	0	1	1
Trunk &lowerextremity	1	3	4

Bites at three sites			
Face, head & neck	1	0	1
Head, neck & trunk	1	1	2
Neck & upper extremity	0	1	1

Majority (79.8%) patients were bitten at one site (Table 2). Majority (90.4%) had category II wounds and were treated on OPD basis while 11(9.6%) had category III wounds and were admitted in ward and observed. Ninety one patients presented within 24 hours of dog bite while 23 presented within 24-72 hours of bite. 70 patients reported directly in emergency while 44 were referred from general practitioners. Out of 11 patients admitted in ward 7 developed fever and had raised TLC count after admission despite all the measures taken as described above and were considered to have wound infection. Two patients were referred to plastic surgery department for surgical procedures. None of patients developed rabies.

## DISCUSSION

Studies show that age group in which most dog bites occur are children less than 15 years old as compared to other age groups and 3.9% off all emergency visits are by male children with dog bite.<sup>5</sup> Male predominance has been showed by other studies too.<sup>7-9</sup> Dog bite was found to be more common among children living in urban areas. This may be due to the fact that most patients do not present to any medical facility or not reported.<sup>[3]</sup> Distance of our hospital from the rural areas and patients reporting to primary and secondary health care facilities may also be involved. There was equal number of patients who were bitten by familiar or pet dogs and those who were bitten by unfamiliar or stray dogs although some studies show that there is more incidence of bites by familiar or pet dogs and most of bites occur in or around the victims own house.<sup>8-10</sup> This study demonstrated that 79.8% were bitten on one site in body, 19.7% on two sites while 3.5% were bitten at 3 or more sites. Venkatesan et al. showed almost similar number of sites in their study that is 87.4% at one site, 10.4% at two sites and 4.9% at three or more

sites.<sup>11</sup> Most common site of bite in our study was lower extremity(56.1%). Our findings are similar to study by Venkatesan et al. who also reported lower limb to be most common site. On the contrary Weiss et al. reported to be head, neck and face as most common sites of injury in children.<sup>5</sup> similar findings were noted by Van et al.<sup>7</sup>

Interference of patients with dogs resulted in almost half of bites in our patients. These bites could have been prevented if children are adequately educated regarding behavior of dogs. Studies in school and preschool children has shown that this risk can be reduced by school education programs.<sup>15</sup> Most of patients(90.4%) in our study had category II (superficial) wounds while rest had category III (deep) wounds which is similar findings to many studies published previously.<sup>7-11</sup> Most of patients reported within 24 hours of dog bite but there is a significant number of patients (16.7%) who reported late. This shows lack of awareness among people regarding post exposure prophylaxis and complications of dog bite. A study done in Karachi reported that there is lack of knowledge among masses regarding post exposure prophylaxis of rabies in urban population and people are unaware of consequences of dog bite.<sup>12</sup> Another study determined that ineffective post exposure prophylaxis leads to deaths by rabies after dog bite.<sup>13</sup> There is dire need of developing awareness among patients and health care workers in Pakistan regarding dog bite management which can lead to death prevention due to rabies.<sup>14</sup> Patients who had deep wounds developed infection at the site of bite. Cellulitis and lymphangitis have been reported in animal and human bites at the site of bite.<sup>8</sup> None of our patients developed much feared complication of rabies. There is limitation to our study that no data was available about vaccination or rabies status of the dogs. So we cannot determine the

role of adequate post exposure prophylaxis prevents any transmission of rabies.<sup>4</sup> There is an increase incidence of dog bite among male children<sup>[7,8,9]</sup> and pet dogs are equally responsible for dog bites as compared to stray dogs. There should be adequate school education programs about dog bite among children.<sup>12-15</sup>

## CONCLUSION

1. Dog bites are common among children less than 12 years of age with a male predominance.
2. Dog bite can be prevented by reducing the number of pet dogs and school education programs for children as well as awareness in whole community.
3. Local wound complications depend on type of wound and post exposure treatment.

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