IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 4 Ver. V (Apr. 2015), PP 55-59
www.iosrjournals.org

Pattern of Injuries Caused By Animal and Management among Patients Attending At Out-Patient Department of a Rural Medical College, West Bengal, India

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Abstract:
Introduction: *Animal bite is a major public health problem in India. Multiple factors contribute to high mortality and morbidity due to animal bites.*
Objectives: *Describing nature of man-animal contact, nature of injury, self-management and treatment at hospital were the objectives of the study.*
Methodology: *It is a cross-sectional, descriptive epidemiological study conducted at Malda Medical College & Hospital, West Bengal in 2014. All patients attended with animal caused injuries were taken as study participants. Cases were exit-interviewed.*
Result: *Animal caused injury is more prevalent in 1st four decades of life (78.03%). Dog being most common offending animal (74.28%) & 16.34% were stray. 139 (40.17%) cases were provocative. Most common body site involved was lower limb [232(67.05%). 194(56.07%) patients washed the affected site, 58(16.76%) applied antiseptic in wound, 55(15.90%) took inj. Tetanus Toxoid. 5(1.45%) patients taken 1st dose of Anti Rabies Vaccine (ARV). 312(90.17%) attended with category III wound and 34(9.83%) with category II wound. All Category III wound patients received ARV but not Anti-Rabies Immunoglobulin. Among Category II wound patient, 30(88.24%) received ARV but 4(11.76) not received ARV.*
Conclusion: *There is a need to create awareness regarding epidemiology & management of animal bites among the service providers and general community.*
Keywords: *Injuries, animal caused, pattern, West Bengal.*

I. Introduction

Since beginning of the human civilization, man came in contact with many animals. Some of the animal became pet and others not. In these interactions, man often gets injured by animals. Among the animals dog, cat, monkey, rat are common with which man get injured. Dog bite being commonest injury, drawn attention of the academician.[1,2,3,4,5,6, 7, 8]Other than the injury and suffering, Rabies is the most dreaded complication of animal caused injures mainly canine ones with 100% fatality. That's why most of the research & study were conducted surrounding dog bites & rabies.[5, 8]Few published papers found on animal caused injuries as a whole.[6, 7] These documented that multiple factors contribute to high mortality and morbidity due to animal bites. An effective strategy for control of rabies takes into account the epidemiology of animal bites, rabies and factors influencing post exposure treatment.[8]With these necessity the present study was carried out with the objective of describing the patient demography & socio-economic profile, nature of man animal contact, nature of injury, self-management before attending hospital and treatment at hospital.

II. Methodology

It is descriptive epidemiological study, cross-sectional in design. All the patients with different animal causing bite, scratch and other injuries attending at General Out Patient Department (OPD) at Malda Medical College & Hospital, Malda, West Bengal, an remote rural medical college during 1st January – 30th June 2014 were formed the population under study. Census method applied i.e., all the patients considers under study. No sampling done. Selected cases with animal caused injuries were interviewed at the exit of the OPD with help of a per-designed and pre-tested data collection form. Data obtained were compiled and analysed in Microsoft Excel Workbook of Microsoft Office 2010 software package in computer.

III. Result

At Malda Medical College General OPD during 1st January – 30th June 2014 a total of346 patients with animal caused injuries attended. All these 346 patients were interviewed at exit with a data collection form. Following are the result obtained.

Among the patients, males were more found to have animal caused injury than females [241(69.65%) male vs. 105(30.35%) female]; gender ratio being 2.29:1. Patients are of diverse age range between 1.5 years baby to 80 years old; mean age being 28.47±34.10 years, median age being 27 years and mode 35 years. Animal injured cases found equally prevalent in each of first four decades of life [65(18.79%) in first decade, 67(19.36%) in second decade, 68(19.65%) in third decade & 70(20.23%) in fourth decade]. Thereafter it declined gradually. (TABLE 1)

People in rural area234(67.63%) were more affected than urban112(32.36%); ratio being 2.08:1. Among rural residents169(70.12%) affected were male and 65(61.90%) were female. In urban 72(29.88%) affected were male and 40(38.10%) were female.

Among the cases under study, 55(15.90%) were illiterate, 77(22.25%) were just literate, 107(30.92%) were primary educated, 32(9.25%) were secondary educated, 26(7.51%) higher secondary educated, 18(5.21%) have education graduation and above and 31(8.96%) were child aged 7 year or less for whom literacy is not counted.

Socio-economic status of the study participants were analysed according to B.G.Prasad's Socio-Economic Scale. Accordingly, 123(35.55%) cases were found in social class V, 107(30.92%) in social class IV, 48(13.87%) in social class III & II each and 20(5.78%) in social class I.

Among offender animal in urban area 69(61.61%) were dogs, 25(22.32%) were cats, 13(11.61%) were monkeys, 3(2.68%) were rats and 1(0.89%) was man & goat each; in rural area 188(80.34%) were dogs, 25(10.68%) were cats, 9(3.85%) were monkeys, 4(1.71%) were rats, 3(1.28%) were men & fox each, 1(0.43%) were jackal and in one case it was uncertain about the animal. Considering both the area, dogs top listed (74.28%) followed by cat (14.45%).(TABLE 2)

Among the dogs causing injuries 215(83.66%) were stray dogs, 42(16.34%) were pet dogs; among cat 23(46%) were stray and 27(54%) were pet; the only goat was pet one and monkey, fox, jackal, rat – all were stray animals.

Regarding provocation to injury, it was found that 139 (40.17%) injuries were provocative and 207(59.54%) were non-provocative and 1(0.29%)was uncertain. Among provocative injuries, the largest no. of cases were by the dogs 98(70.50%), followed by cat 31(22.30%) and monkeys 6(4.32%). Among non-provocative cases dogs were 159(77.18%) followed by cat 19(9.22%), monkey 16(7.77%), rats 7(3.40%) and rest by other animals. (TABLE 3)

On analysis of exact incidence causing injury, it was found that among non-provocative injury highest number of cases [124(60.19%)] came with history of spontaneous bite while walking on the street or working on the roof, followed by 21(10.19) injury occurred while playing, running and cycling, 16(7.77%) by mad dog and rests in other incidence. Among provocative incidence, 101(72.66%) cases caused in a case of beating/ injuring the animal followed by other incidences. (TABLE 4)

From time distribution analysis of animal caused injury, it was seen that highest number of injury 152(43.93%) occurred at morning (between 5.00 am to 12.00 noon), followed by 92(26.59%) in afternoon (between 12 noon to 05.00 pm), 55(15.90%) at evening (5.00 – 8.00 pm) and rest 47(13.58%) at night (8.00pm to 5.00 am).

116(33.53%) cases of animal caused injured under study came referred from blocks of the district and 230(66.47%) attended at OPD directly by self.

Calculating time interval between injury and attendance at the hospital it was found that the mean time was 66.79±241.56 minutes, range 0 to 960 minutes, mode & median each 24 minutes. 15(4.34%) cases attended at hospital instantly, 196(56.65%) attended within 24 hours, 101(29.19%) – within 7 days, 33(9.54%) cases came between 7 -30 days and 1(0.29%) after one month.

Among the injured patient 336(97.11) came directly seeking vaccine and 10(2.89%) for management of the injury.

Most common body site involved in animal caused injury was lower limb [232(67.05%)], followed by 90(26.01%) was upper limb, 20(5.78%) were in face and rests in other body parts. In some cases more than one body sites got involved. (TABLE 5)

264(76.30%) cases came with bite by animals and rest 90(26.01%) with scratching by animals.

On asking patients about what they did after injury by themselves before attending at hospital, varied response came. 194(56.07%) patients washed the affected site with plain water, soap water or saline water, 58(16.76%) applied antiseptic in wound, 55(15.90%) took inj. Tetanus Toxoid. 5(1.45%) patients judiciously taken 1st dose of Anti Rabies Vaccine (ARV) and others either done erratic management or nothing. (TABLE 6)

Presenting symptoms after animal caused injuries were pain & bleeding 253(73.12%) each, swelling – 57(16.47%), burning sensation, repeated pus in wound and fever among some. (FIG. 1)

Among 346 patients 312(90.17%) attended with category III wound and rest 34(9.83%) with category II wound. All of the Category III wound patients received ARV but not received Anti-Rabies Immunoglobulin, i.e., inadequate treatment received. Among 34 Category II wound patient, 30(88.24%) received ARV but 4(11.76) did not received ARV, i.e., inadequate treatment. 281(81.21%) patients received Inj. Tetanus Toxoid, few patients received Antibiotic [21(6.07%)], Analgesic [19(5.59%)], Dressing [16(4.62%]& suturing [5(1.45%)] of wound where needed.

IV. Discussion

Sudarshan M K, Mahendra B J, Madhusudana S N et. al. in their multi-centric epidemiological study of Animal Bites in India showed that the annual incidence of animal bites was 1.7% and it was more in rural areas (71.8%), children (2.6%) and poor/low income group (75%). The main biting animal was dog (91.5%), mostly stray (63%), followed by cat (4.7%). A high proportion of bite victims did not wash their wounds with soap and water (39.5%), preferred Government hospitals (59.9%) and anti-rabies vaccine (46.9%). The use of rabies immunoglobulin was low (2.1%). The recourse to indigenous treatment (45.3%) and local application to wound (36.8%) was quite prevalent. The situation was slightly better in urban areas.[2]

Similar picture was also noted in the present study where 63% were rural resident, 70.50% was dog bite, followed by cat (22.30%); 83.66% were stray dogs & 46% were stray cat. All Category III wound patients received ARV but not received Anti-Rabies Immunoglobulin, among Category II wound patients, 88.24% received ARV. 56.07% patients washed the affected site with plain water, soap water or saline water & 16.76% applied antiseptic in wound.

In the study of Chauhan P, Saini G at Jodhpur, India, 44.75% of animal bite cases were adult males and 19.56% cases were of age group 6-10 years. 42.46% bites among under 15 years male were on trunk whereas it was 41.66% among females; whereas in adults the most common bites were on lower limbs. The most common biting animal was dog (95.62%) and 72.69% was Category III wound.[6]

In the present study also, males were more found to have animal caused injury than females, gender ratio being 2.29:1. Cases found equally prevalent in each of first four decades of life, thereafter it declined. Most common body site involved was lower limb (67.05%), followed by upper limb (26.01%) & other body parts (5.78%).

In another study conducted at a tertiary care institute in Mumbai, India, by Gogtay N.J, Nagpal A, Mallad A et. al, it was found that the victims were largely males (77.1%), dog was the major biting animal (89.1%), bites were mainly of Category III (78.3%); 15.9% subjects used indigenous treatment only for local wound care; of the Category III bites, 2.7% patients were prescribed human rabies immunoglobulin (HRIG) which are corroborative of the current study.[7]

In the multi-centric study on animal bites & rabies cases in India, Ichhpujani RL, Mala C, Veena M et al showed that dog bites caused maximum morbidity (92%). Second most common biting animal was monkey (3.2%), followed by cat (1.8%), fox (0.4%) etc. Most bites (64.3%) were unprovoked bites by stray (64.7%) animals. In this study 72.4% animal bite victims were males and 47.5% were children in age group of 2-18 years. 63% had Category III exposure as per the WHO classification. Before coming to Anti Rabies Clinics (ARC) 58.5% people had washed the wound with water/soap or water alone. Some of the bite victims (10.8%) had also applied chillies, salt, turmeric powder, lime, snuff powder, paste of leaves, acid, ash given by Peer Baba (magician) etc. These practices varied from one region to another. Of the six centres, Rabies Immunoglobulin (RIG) was available and was being used at only two centres.[8] These findings were also very much similar to the current study.

V. Figures and Tables

Table 1. Age &gender-wise distribution of patients under study.

Age group (years)	Male No.(%)	Female No.(%)	Total No.(%)
0-10	45(18.67)	20(19.05)	65(18.79)
11- 20	50(20.75)	17(16.19)	67(19.36)
21-30	52(21.58)	16(15.24)	68(19.65)
31-40	42(17.43)	28(26.67)	70(20.23)
41-50	27(11.20)	9(8.57)	36(10.40)
51-60	18(7.47)	8(7.62)	26(7.51)
61-70	5(2.07)	7(6.67)	12(3.47)
71-80	2(0.83)	0(0.00)	2(0.58)
Total	241(100.00)	105(100.00)	346(100.00)

Table 2. Distribution of cases according to residence and animal causing injury.

Animal causing injury	Urban	Rural	Total
	No.(%)	No.(%)	No.(%)
Dog	69(61.61)	188(80.34)	257(74.28)
Cat	25(22.32)	25(10.68)	50(14.45)
Monkey	13(11.61)	9(3.85)	22(6.36)
Rat	3(2.68)	4(1.71)	7(2.02)
Fox	--	3(1.28)	3(0.87)
Goat	1(0.89)	--	1(0.29)
Jackal	--	1(0.43)	1(0.29)
Man	1(0.89)	3(1.28)	4(1.16)
Uncertain-dog/fox	--	1(0.43)	1(0.29)
Total	112(100.00)	234(100.00)	346(100.00)

Table 3. Nature of animal & provocation for injury.

Animal causing injury	Non-provocative	Provocative	Total
	No.(%)	No.(%)	No.(%)
Dog	159(77.18)	98(70.50)	257(74.28)
Cat	19(9.22)	31(22.30)	50(14.45)
Monkey	16(7.77)	6(4.32)	22(6.36)
Rat	7(3.40)	--	7(2.02)
Fox	3(1.46)	--	3(0.87)
Jackal	1(0.29)	--	1(0.29)
Goat	--	1(0.72)	1(0.29)
Jackal	1(0.49)	--	1(0.29)
Man	1(0.49)	3(2.16)	4(1.16)
Uncertain-dog/fox	1(0.49)	--	1(0.29)
Total	207(100.00)	139(100.00)	346(100.00)

Table 4. Distribution of study subjects according to exact incidence.

Exact incidence of animal caused injury	**No.(%)**
Non-provocative (n=207)	
Spontaneously while walking on street/ working on roof	124(60.19)
Playing, running, cycling	21(10.19)
Mad dog	16(7.77)
Standing in road, side of quarrel of a dog's group	10(4.85)
Sleeping/ on ground / field	9(4.37)
Going to field/ grazing	6(2.91)
Picking plastics/ Begging in village/ vending with bucket on head/ picking vending bucket on head	5(2.43)
Feeding the animal	5(2.43)
Eating, drinking	4(1.94)
In work	3(1.46)
Drying cloths on the roof	2(0.97)
Cooking	1(0.49)
Uncertain	1(0.49)
Total	207(100.00)
Provocative(n=139)	No.(%)
Bitten the animal/ throwing stone/ stick, kicked the animal, Pulled legs/ tail of animal, stepped on the animal, jumped over, sat on the animal	101(72.66)
Cycle run over/ Hitted the animal	3(2.16)
Feeding the animal	21(15.11)
Playing with the animal	7(5.04)
She was with food in her hand	1(0.72)
Tried to tie, touch the animal	2(1.44)
Rescuing a puppy/protecting/ touched a puppy mother bitten	4(2.88)
Total	139(100.00)

Table 5. Body region involved in animal caused injury among study participant.

Body region injured*	No. (%)
Head	3(0.87)
Face	20(5.78)
Neck	2(0.58)
Chest	1(0.29)
Abdomen	5(1.45)
Back	5(1.45)
Upper limb	90(26.01)
Lower limb	232(67.05)

*In some cases multiple body sites involved.

Table 6. Self-management by patients before attending at hospital.*

Mode of management	No.(%)
ARV 1st dose	5(1.45)
Antibiotic, Analgesic	5(1.45)
Inj. Tetanus Toxoid	55(15.90)
Washed with plain water, soap water, saline water	194(56.07)
Applied antiseptic, sprit	58(16.76)
Applied lime, acid, kerosene oil, ash, tooth paste, antifungal, steroid ointment	12(3.47)
Dressing with bandage	5(1.45)
Applied heat	1(0.29)
Eaten herbs	1(0.29)
Nothing done	96(27.75)

*In some cases more than one type of management done.

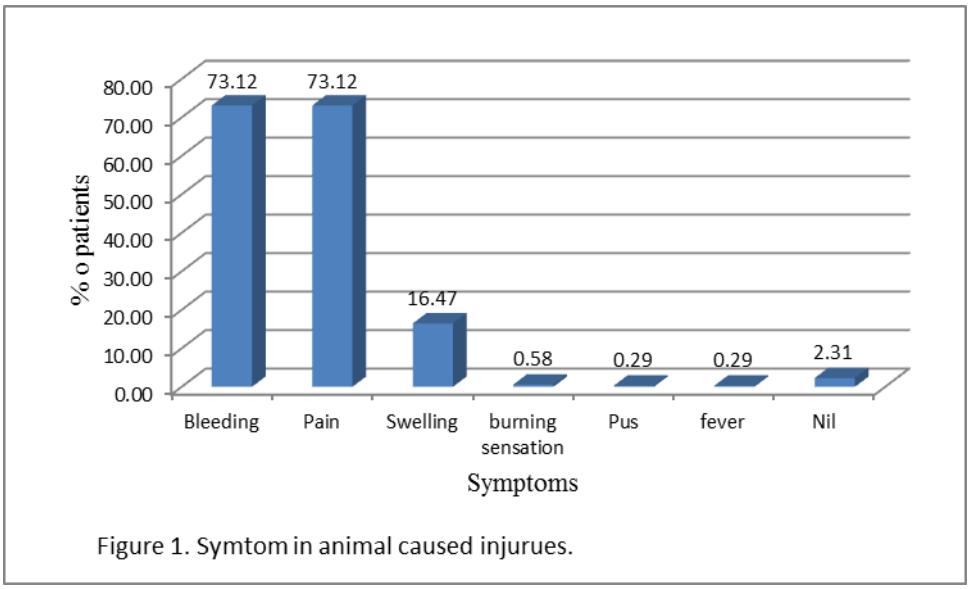

Figure 1. Symtom in animal caused injurues.

VI. Conclusion

The study provides an overview of epidemiology of animal bites in a rural tertiary set up and the dimensions of self-management and care by the attending hospital. There is a need to strengthen Information, Education and Communication (IEC) programme regarding merits of local wound management. Anti-Rabies Centre should be strengthened in terms of facilities and availability of safe and effective anti-rabies immunoglobulins. There is a need to create awareness regarding epidemiology, management at home &hospital for animal bites among the service providers and general community.

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