

## Factors Influencing Treatment of Animal Bite and Prevailing Practices Regarding Wound Care among Cases Attending Referral Hospital of Ahmedabad City, Gujarat

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### Abstract:


**Introduction:** In rabies endemic country like India, where every animal bite is potentially suspected as rabid animal bite the treatment should be started immediately. **Objective:** To study socio demographic profile, delay in seeking treatment and wound treatment at home among the animal bite cases. **Method:** Records of Animal bite cases from January-June 2016 were analyzed and 155 patients (12.5%) with animal bite were interviewed, after taking their informed verbal consent. **Results:** Total 1225 cases, 836 (68.2 %) were males and 389(31.8%) were females. Among them 1121 (91.5%) were category II bites and 558(45.6%) patients had missed one or more doses. There was statistically significant association between age groups and the doses missed and between gender and the doses missed. Among the 155 interviewed, 100(64.5%) were males and 55(35.5%) were females. About 90(58%) came to health facility within 24 hours of the bite. About 50 (32.3%) subjects missed to take the dose on scheduled date after taking the first dose. Only 61(39.4%) performed correct wound treatment at home. Association between action taken for wound treatment and gender was statistically significant. Association for delay in taking the next doses after the first dose and age group was statistically highly significant. **Conclusion:** Most cases of animal bite were dog bite cases. More than half reached the health facility within 24 hours. More than half treated the wound incorrectly at home.

**Key words:** Animal bite, Referral hospital, Wound treatment

### Introduction:

Rabies is a zoonotic disease, caused by the rabies virus, of the Lyssavirus genus, within the family Rhabdoviridae. Domestic dogs are the most common reservoir of the virus, with more than 95% of human deaths caused by dog-mediated rabies. The virus is transmitted in the saliva of rabid animals through the wound (e.g. scratches), or by direct exposure of mucosal surfaces to saliva from an infected animal (e.g. bites).<sup>[1]</sup>

As per World Health Organization, with the exception of Antarctica, rabies is endemic on all continents. Of the tens of thousands of deaths occurring annually due to rabies, 95% of cases are reported in Asia and Africa. In Asia, the highest incidence and deaths are reported in India. But estimates of burden have always been uncertain due to the absence of reliable data especially in Middle East and Central Asia.<sup>[1]</sup> In urban areas the disease is mainly transmitted by dogs, being responsible for

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96% of animal bite cases. <sup>[2]</sup> Animal bite cases if managed appropriately and timely the disease is preventable to a large extent. In this regard post exposure prophylaxis treatment (PEP) is of prime importance. <sup>[2]</sup>

In rabies endemic country like India, where every animal bite is potentially suspected as rabid animal bite the treatment should be started immediately. People who present late after possible rabies exposure should be evaluated and treated as if the event had occurred recently. <sup>[1]</sup> Post exposure prophylaxis is a three pronged approach. Rabies vaccine is given to people at high risk of rabies to protect them if they are exposed. It can also prevent the disease if it is given to a person after they have been exposed. Rabies vaccine is made from killed rabies virus. It cannot cause rabies. <sup>[2]</sup>

In India NTV (Neural Tissue vaccine) was used in the past. Now Active immunization is achieved by administration of safe and potent Cell Culture Vaccine. <sup>[2]</sup> As per the current regimen (Thai Red Cross Schedule) 2-2-2-0-2, Which involves injection of 0.1 ml of reconstituted vaccine per ID site (intra dermal) and on two such ID sites per visit (one on each deltoid area, an inch above the insertion of deltoid muscle) on day 0, 3, 7, 28. The day 0 is the day of first dose administration of intra dermal rabies vaccine (IDRV) and may not be the day of rabies exposure/ animal bite. <sup>[2]</sup>

The wound of animal bite must be cleaned properly as the rabies virus enters human body through wound. Since rabies virus can persist and even multiply at the site for a long time wound toilet is must even if the patients reports late. <sup>[2]</sup> Rabies in dogs is still common in many parts of the world, and the vast majority of human rabies cases worldwide come from being bitten by rabid dogs. <sup>[3]</sup> Thus to understand the factors that play a role in seeking treatment and what practices are adopted in the community for wound care, the study was undertaken.

### Objectives:

1. To study socio demographic variables of animal bite cases, reason for delay in initiation treatment and the practices related to wound care after animal bite
2. To correlate various socio demographic variables with completion of treatment and reasons for delay in treatment

### Method:

Animal bite cases visiting the Referral hospital were studied from January to June 2016. Information available from the register of the hospital was collected and analyzed. It was planned to interview 10% patient and taking 2.5% non response rate total 12.5% patients were conveniently selected to understand other factors, after taking their informed verbal consent. In patients who presented after 24 hours of animal bite, the reasons for delay in initiation of treatment were inquired Patients were followed till they came for the last dose. All the patients were informed about the date of next dose during the interview. Category of bite was taken as assigned by the treating medical officer. All the patients were provided injection tetanus toxoid intramuscularly; wound dressing and ARV (Anti rabies vaccine) injection intradermally as per the standard treatment regimen. Additionally anti rabies serum was provided to category III patients.

### Results:

Analysis of 1225 records of patients showed that 836 (68.2 %) were males and 389(31.8%) were females. Most common age group was 15 to 60 years and mean age was 28.77 years with Standard Deviation of 18.6 years. Most common category of bite was II and 557(45.6%) patients had missed one or more doses. On analyzing further, number of doses missed revealed that 229(41.11%) missed one dose and 152(27.29 %) missed two and 176(31.60%) missed three doses. (Table1).

**Table 1: Distribution of characteristics of all animal bite cases (N=1225)**

Variables		No. (%)
Gender	Male	836 (68.2)
	Female	389 (31.8)
Age Group	0-14	346 (28.2)
	15-45	626 (51.1)
	46-60	182 (14.9)
	>60	71 (5.8)
Category of bite	I	3 (0.2)
	II	1121 (91.5)
	III	101 (8.3)
Any dose Missed	Yes	557 (45.5)
	No	668 (54.5)
No. of Missed doses (N=557)	1	229 (41.1)
	2	152 (27.3)
	3	176 (31.6)

There was statistically significant association between age groups and the doses missed and same was true for gender and the doses missed. Males have missed doses in higher proportion than the females. Also when the association was done for age group and the number of doses missed it was not significant statistically. And also same was true for gender and number of doses missed. (Table2)

**Details of interviewed patients:**

Of 155 interviewed patients 100(64.5%) were males and 55(35.5%) were females and their mean age was 28.66 with SD of 17.64. Minimum age was 2 years and maximum age was 80 years. About 13 (8.4%) were illiterate. It was found that 154(99.4%)

had dog bite and only one was bitten by other animals like monkey. Majority, 143 (92.3%) had category II bite, 3 (1.9%) patient had category I bite and 9 (5.8%) patient had category III bite. In more than half, right side of the body was affected and most common site (139) was lower limb with 89.1%.

Further it was found that 120 patients (77.4%) had single and 35(22.6) % had multiple bites and similarly 144(92.9%) had superficial and 11(7.1%) had deep bites. About 91(58.70%) came to health facility within 24 hours of the bite for treatment. About 50 (32.3%) subjects missed to take the dose on scheduled date after taking the first dose. Most common reason for delay in seeking treatment was

**Table 2 : Association between doses of vaccine missed and other variables**

Variable				Chi Square, p value
Age group (Years)	Doses Missed		Total	
	Yes	No		
0-14	152(43.9)	194(56.1)	346(100)	7.01, 0.07
15-45	301(48.1)	325(51.9)	626(100)	
46-60	81(44.5)	101(55.5)	182(100)	
>60	23(32.4)	48(67.6)	71(100)	
Gender	Doses Missed			
Female	153(39.33)	236(60.67)	389(100)	
Male	404(48.3)	432(51.7)	836(100)	
Age group (Years)	No of Doses Missed			3.90, 0.6
	1	2	3	
0-14 (n=152)	58(38.16)	44(28.95)	50(32.89)	
15-45(n=301)	132(43.9)	74(24.6)	95(31.6)	
46-60(n=81)	29(35.8)	27(33.3)	25(30.9)	
>60(n=23)	10(43.48)	7(30.43)	6(26.09)	
Gender	No of Doses Missed			
Female(n=153)	67(43.79)	41(26.79)	45(29.41)	
Male(n=404)	162(40.00)	111(27.48)	131(32.42)	

ignorance (86%) and in remaining the reasons were busy, to attain some function and holiday at centre.

In immediate treatment of wound at home, about 33(22%) people washed the wound with only water and 28(18%) used soap and antiseptic in cleaning the wound. About 61 (39.35%) did nothing before visiting the hospital, Apart from this; various other items were applied on the site of bite by rest of them

like tobacco(7,4.52%, snuff (4, 2.58%), chilli powder (16,10.32%), and in few others even talcum powder; turmeric, lime (chuna), toothpaste and tea were used. Thus only 61(39.4%) took correct action and rest as per the myths prevalent in the society. Of all, 126(81.3%) received all doses and completed vaccination and 29(18.7%) missed doses and had incomplete vaccination. (Table 3)

**Table 3: Distribution of Socio demographic variables in interviewed animal bite cases (n=155)**

Variables	Males (n=100)	Females (n=55)	Total (n=155)
<b>Age group (Years)</b>			
1-14	28(68.29)	13(31.71)	41(26.5)
15-60	51(60)	34(40)	85(54.84)
46-60	17(85)	3(15)	20(12.90)
>60	4(44.44)	5(55.56)	9(5.8)
<b>Education</b>			
Illiterate	10(76.92)	3(23.08)	13(8.4)
Just literate	6(60)	4(40)	10(6.5)
Primary	26(59.09)	18(40.91)	44(28.4)
Secondary	16(69.57)	7(30.43)	23(14.8)
Higher Secondary	16(55.17)	13(44.83)	29(18.7)
Graduate and above	19(73.08)	7(26.92)	26(16.8)
NA(age less than 7yrs)	7(77.77)	3(33.33)	10(6.4)
<b>Delay in initiation of treatment after the bite(n=64)</b>	1 to 3 days	37	57.81
	3 to 5 days	24	37.50
	More than 5 days	3	4.69
<b>Doses missed(n=155)</b>	Yes	50	32.3
	No	105	67.7
<b>Number of dose missed</b>	2 <sup>nd</sup> Dose (day3)	10	20
	3 <sup>rd</sup> Dose( day 7)	14	28
	4 <sup>th</sup> Dose( day 28)	26	52
<b>Wound care at home</b>	Correct	61	39.4
	Incorrect	94	60.6

Table 4: Association of various factors with delay in starting the treatment and wound care

Variables			Chi Square	p value
<b>Delay in seeking treatment</b>	<b>Yes</b>	<b>No</b>		
<b>Gender</b>				
Female (n=55)	27(49.09)	28(50.91)	2.140	0.144
Male(n=100)	37(37)	63(63)		
<b>Age group(years)</b>				
0 to 14 (n=41)	16(39)	25(61)	6.35	0.09
15 to 45(n=85)	35(41.2)	50 (58.8)		
46 to 60 (n=20)	12(60)	8(40)		
>60 (n=9)	1(11.11)	8(88.89)		
<b>Wound care</b>	<b>Incorrect</b>	<b>Correct</b>		
<b>Gender</b>				
Female (n=55)	27(40.09)	28(50.91)	4.769	0.029
Male (n=100)	67(67)	33(33)		
<b>Age group(years)</b>				
0 to 14 (n=41)	27(40.09)	14(34.15)	1.91	0.59
15-45(n=85)	48(56.5)	37(43.5)		
46-60 (n=20)	14(70)	6(30)		
>60 (n=9)	5(55.56)	4(44.44)		
<b>Delay in taking doses after 1<sup>st</sup> dose</b>	<b>Yes</b>	<b>No</b>		
<b>Gender</b>				
Female (n=55)	17(30.90)	38(69.10)	0.071	0.79
Male(n=100)	33(33)	67(67)		
<b>Age groups</b>				
0 to 14 (n=41)	20(48.78)	21(51.2)	10.80	0.012
15 to 45(n=85)	20(23.5)	65(76.5)		
46 to 60 (n=20)	5(25)	15(75)		
>60 (n=9)	5(55.56)	4(44.4)4		

When association was done for delay in taking the next doses after the first dose and other variables, it showed statistically highly significant relation with only age group and no statistical association with other variables like gender. (Table 4)

### **Discussion:**

This study was conducted in a referral hospital by analyzing 1225 records of animal bite cases. There were 68.2 % males and 31.8% females. A similar finding was observed in the studies done by Gogtay et al, Vyas et al and Ganasva et al. <sup>[4,5,6]</sup> Most common age group in our study was 15 to 60 years (66%) whereas a study by Naik et al in Puducherry found that maximum numbers of respondents were aged 30 – 44 years.<sup>[7]</sup> Mean age in our study population was 28.77 years with SD of 18.6 whereas study by Vyas et al in Ahmedabad city found mean age of cases as 19+20.2 years.<sup>[5]</sup>

Most common category of bite was II (91.7%) in our study and study by Piyush Jain and Garima Jain also supported the similar finding<sup>[8]</sup> and also study by Naik et al in Puducherry found Category II (58.3%) as most common<sup>[7]</sup> whereas the study by Gogtay et al, Vyas et al found category III as more common type of bite.<sup>[4,5]</sup>

In present study, 45.6% of patient had missed one or more doses. Adults in the age group 15 to 60 years have missed doses in higher percentage than other age groups. Same way males have missed doses in higher proportion than the females. And this was statistically significant. This can be explained by active population is working and getting a dose of vaccine may affect their work and wages and also males are more commonly going outside for work and are the earning members of family.

This study also conducted detailed interview of about 155 victims and among them about 5.8% were illiterate and 28.4% were educated up to primary level. Study by Ganasva et al in Maharastra found that 15.4% of the patients were illiterate and 29.8% patients were educated up to primary level.<sup>[6]</sup> Our

study showed that 99.4% had dog bite and the same finding was shared by studies by Gogtay et al and Sudarshan et al.<sup>[4,9]</sup>

In present study most common site of bite was lower limb with 89.1%. and same was true in the study by Vyas et al, and Piyush Jain and Garima Jain<sup>[5,8]</sup> Also study by Naik et al found that in 75% cases lower limb was most common site of the bite<sup>[7]</sup> and same was found in a study by Kabeta et al in Ethiopia<sup>[10]</sup> In a study by Venkatesan et al in Tamilnadu found that most common site of bite was lower limb (53.3%) followed upper limb (27.6%), and trunk (8.6%).<sup>[11]</sup>

In this research about 58% patients came to health facility within 24 hours of the bite for treatment and rest 32% after 24 hours and similar finding was shared by Liu et al where 35.3% of animal bite victims went to the centre after more than 24 hours after exposure.<sup>[12]</sup> whereas the study by Naik et al found that all the animal bite victims had received rabies immunization within 24 hours of bite and Ganasva et al found that 80% had reported within 24 hours of dog bite to the ARV Clinic.<sup>[6]</sup> Kabeta et al found that half of the cases presented to the health center within 3 days.<sup>[10]</sup> As per the study by Esmailzadeh et al, 85.9% patients came within 24 hours of the animal bite.<sup>[13]</sup> In our study, about 32.3% subjects missed to take the dose on scheduled date after taking the first dose. Most common reason for delay in seeking treatment was ignorance about the treatment (86%).

In this study, about half of the subjects did nothing before visiting the hospital, but Piyush Jain and Garima Jain found 16% of victims did not take any primary home management measures.<sup>[8]</sup> In our study, only 39.4% took correct action for wound treatment which was washing the wound with soap and water or applying antiseptic and rest of the patients (60%) applied various items on the wound like tobacco, snuff, chilli powder, talcum powder, turmeric, lime (chuna), toothpaste and even tea. In a study by Sudharshan et al about 40% of bite victims

did not wash their wounds with soap and water<sup>[9]</sup>, whereas Piyush Jain and Garima Jain found that 80% had applied chilly and oil paste on the wound before visiting the centre<sup>[8]</sup> Naik et al found that 16.6%, had applied oil or turmeric over the wound only two third of the victims had cleaned the animal bite wound with soap and water immediately following the bite.<sup>[7]</sup> Venkatesan et al found that 36% victims cleaned the wound by using soap and water and 21% cases applied irritants such as onion, ash, lime etc. on the wounds.<sup>[11]</sup> whereas Liu et al found that only 18.8% victims cleaned their wounds with water and soap or water only.<sup>[12]</sup>

In this study, delay in seeking treatment had no statistical significance with gender, age group and category of bite whereas it was statistically significant with education level (P=0.007). Similar to our findings Esmaeilzadeh et al also found that delay in the initiation of anti-rabies PEP was not significantly related to the age group and the sex of the subject.<sup>[13]</sup> But Liu et al found initiation of PEP was associated with age class.<sup>[12]</sup>

Present study found that gender was statistically significantly associated with wound treatment (P=0.02) and same was supported by Liu et al. as they found that wound treatment was related to gender.<sup>[12]</sup>

Current study found no association between the wound treatment and other variables like age group, education and category of bite but the study by Liu found that for wound treatment, those who were male, aged 1–14 years, were without college education, tended to treat the wound improperly and it was statistically significant.<sup>[12]</sup>

### Conclusion:

Most cases of animal bite were dog bite cases. More than half reached the health facility within 24 hours. About one third missed to take the dose on scheduled date. Males missed the doses more than females. And elderly patient delayed taking next dose after the first dose of the vaccine. Ignorance about the

treatment is the main reason of delay. More than half treated the wound incorrectly at home and males practised incorrect wound treatment more than the females. Common items applied on wound were tobacco, chilli powder and turmeric on wound.

### Recommendations:

Increase Awareness about the early initiation of treatment for animal bite and about the correct method of wound cleaning at home after the bite. Also it is important to clear the myths regarding applying of various items on the wound.

### Declaration:

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Conflict of Interest: Nil

### References:

1. Rabies. WHO : [https://www.who.int/health-topics/rabies#tab=tab\\_1](https://www.who.int/health-topics/rabies#tab=tab_1) accessed on 03/07/21.
2. National Guidelines for Rabies Prophylaxis and Intra-dermal Administration of Cell Culture Rabies Vaccines 2007, National Institute of Communicable Diseases, Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India, New Delhi.
3. Rabies. CDC: <https://www.cdc.gov/dotw/rabies/index.html> accessed on 03/07/21
4. Gogtay NJ, Nagpal A, Mallad A, Patel K, Stimpson SJ, Belur A, Thatte UM. Demographics of animal bite victims & management practices in a tertiary care institute in Mumbai, Maharashtra, India. *Indian J Med Res.* 2014 Mar;139(3):459-62.
5. Vyas S, Gupta K, Bhatt G, Tiwari H. Animal bite management practices: Study at three municipal corporation hospitals of Ahmedabad. *National Journal of Community Medicine.* 2010;1(2):75-8.
6. Ganasva A, Bariya B, Modi M, Shringarpure K. Perceptions and treatment seeking behaviour of dog bite patients attending regional tertiary care hospital of central Gujarat, India. *J Res Med Den Sci.* 2015;3(1):60-4
7. Naik BN, Sahu SK, Ganesh KS. Wound management and vaccination following animal bite: a study on knowledge and practice among people in an urban area of Pondicherry, India. *Int J Community Med Public Health* 2015; 2: 501-5.
8. Jain P, Jain G. Study of General Awareness, Attitude, Behavior, and Practice Study on Dog Bites and its Management in the Context of Prevention of Rabies Among the Victims of Dog Bite Attending the OPD Services of CHC Muradnagar. *J Family Med Prim Care.* 2014 Oct-Dec;3(4):355-8.



9. Sudarshan MK, Mahendra BJ, Madhusudana SN, Ashwoath Narayana DH, Rahman A, Rao NS, X-Meslin F, Lobo D, Ravikumar K, Gangaboraiah. An epidemiological study of animal bites in India: results of a WHO sponsored national multi-centric rabies survey. *J Commun Dis.* 2006 Mar;38(1):32-9.
10. Kabeta T, Deresa B, Tigre W, Ward MP, Mor SM. Knowledge, Attitudes and Practices of Animal Bite Victims Attending an Anti-rabies Health Center in Jimma Town, Ethiopia. *PLoS Negl Trop Dis.* 2015;9(6):e0003867. Published 2015 Jun 26. doi:10.1371/journal.pntd.
11. Venkatesan M, Dongre A, Ganapathy K, A Community based cross sectional study of dog bites in children in a rural district of Tamil Nadu. *Int J of Med Sci Public Health.* 2017; 6: 109 -112
12. Liu Q, Wang X, Liu B, Gong Y, Mkandawire N, Li W, et al. (2017) Improper wound treatment and delay of rabies post-exposure prophylaxis of animal bite victims in China: Prevalence and determinants. *PLoS Negl Trop Dis.* 11(7): e0005663. <https://doi.org/10.1371/journal.pntd.0005663>
13. Esmaeilzadeh F, Rajabi A, Vahedi S, Shamsadiny M, Ghelichi Ghogh M, Hatam N. Epidemiology of Animal Bites and Factors Associated With Delays in Initiating Post-exposure Prophylaxis for Rabies Prevention Among Animal Bite Cases: A Population-based Study. *J Prev Med Public Health.* 2017; 50 (3):210-216.