

# Treatment seeking behaviour and compliance regarding Anti-rabies vaccine among animal bite patients in Anti-rabies clinic, at District Hospital Amritsar, Punjab

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## Abstract

**Background:** Rabies is 100% fatal disease. The aim was to determine treatment seeking behaviour among animal bite patients and to assess the compliance regarding post exposure prophylaxis among animal bite patients in anti-rabies clinic.

**Materials and Methods:** A cross-sectional study was conducted in the anti-rabies clinic. A predesigned, pretested, structured questionnaire was used to assess the compliance to post-exposure prophylaxis among the animal bite patients.

**Conclusions:** Motivation is required through proper communication and behavioral change so as to complete the full course of post exposure prophylaxis.

**Key words:** Animal bite patients, Compliance, Post exposure prophylaxis, Rabies.

## Introduction

Rabies is a vaccine preventable zoonotic viral disease that mainly affects the central nervous system. It is almost fatal. Reported number of human deaths due to rabies had been estimated to be 59,000 per year in over 150 countries. Maximum number of cases i.e., 95% occurred in Africa and Asia.<sup>1</sup> Rabies is

one of the neglected tropical illnesses, that primarily affects the poor and disadvantaged population who are marginalised and at risk.<sup>2</sup> Reported number of deaths due to rabies in India is 20,000. The annual incidence of human rabies was estimated to be about 2 per 1,00,000 population according to a national multi centre epidemiological survey.<sup>3</sup>

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With the exception of the islands of Andaman, Nicobar, and Lakshadweep, human rabies continues to be endemic in India. India contributes to 36% of the rabies deaths globally. Although the true toll of rabies in India is unknown, data that is currently available indicates that it results in 18,000–20,000 fatalities annually. Children under the age of 15 account for between 30 and 60 percent of recorded rabies cases and fatalities in India.<sup>4</sup>

Dogs and cats spread rabies most frequently in India (97%), followed by other animals (2%). The high frequency of rabies in India is mostly caused by the presence of unvaccinated free-roaming dogs (FRD), also known as street dogs. Dogs typically spread the rabies virus through saliva when they bite or scratch.<sup>5</sup> Leading cause of rabies related deaths globally in humans occur due to dog bites. Reported incidence of animal bites in India is 17.4 per thousand population. Person is bitten every 2 seconds and someone dies due to rabies every 30 minutes.<sup>6</sup>

For the prevention of human rabies, the WHO recommends two primary immunisation strategies: Pre-exposure prophylaxis (PrEP), which is the administration of rabies vaccine to high risk populations prior to exposure to rabies, and post exposure prophylaxis (PEP), which entails thorough wound washing at the rabies-exposure site, as well as the administration of rabies immunoglobulin (RIG) if indicated. Vaccines can be given intramuscularly (IM) or intradermally (ID) for PEP and PrEP, respectively. The WHO Strategic Advisory Group of Experts (SAGE) has proposed new ID administration schedules that have advantages due to cost, dose, and time savings.<sup>7</sup>

In India every year 15 million people are bitten by animals mostly dogs and requires PEP.<sup>8</sup> Low awareness of the necessity for medical attention following a dog bite leads to numerous fatalities. So, the study was planned to assess the treatment seeking behaviour as well as compliance regarding Post Exposure prophylaxis among animal bite patients.

## Material and Methods

A cross-sectional study was conducted at the District Hospital Amritsar between April to June 2023. Animal bite patients visiting Anti-rabies clinic

of District Hospital for zero dose of Anti-rabies vaccine were included in the study. Animal bite patients reporting to anti-rabies clinic for doses other than zero dose were excluded from the study. Also the patients who didn't give the consent to be a part of present study were excluded.

Wound categorization was done as per classification of animal bite wounds for PEP based on WHO(World Health Organization) recommendations: Category I:Exposure (touching /feeding animals, licks on intact skin).Category II: Nibbling of uncovered skin, minor scratches or abrasions without bleeding. Category III: Single or multiple transdermal bites or stiches, contamination of mucous membrane with saliva from licks, licks on broken skin, exposure to bats.<sup>9</sup>

Out of 252 animal bite patients visiting the Anti-rabies clinic during the study duration, 237 gave informed consent to participate in the study. In case of animal bite patients <18 years of age, informed consent was taken from accompanying person.

Operational definition: Compliant : The study subject who received the full course of ARV, that is, the scheduled doses of ARV on the recommended dates.

Information regarding the sociodemographic profile of animal bite patients and details of practices related to wound care among the patients and compliance to anti-rabies vaccine was collected using a predesigned, pretested, structured questionnaire. Follow up was done for each study participant. The patients who didn't come for anti-rabies vaccination as per schedule were contacted telephonically to enquire about the reasons for not getting anti-rabies vaccine.

The analysis of data was performed using SPSS version 23.

Ethical consideration: The ethical clearance was given by the Ethics committee of Sri Guru Ram Das institute of Medical sciences.(Ref. no. SGRD/IEC/2023-184 )

**Results**

**Table 1: Sociodemographic profile of animal bite patients**

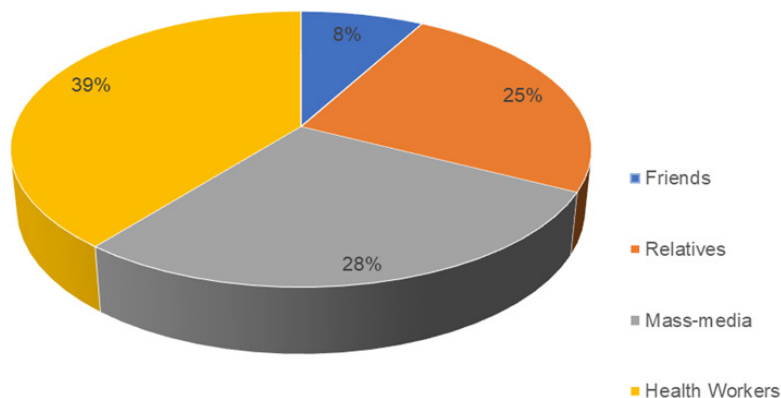
Sociodemographic profile	Frequency (n=237)	Percentage (%)
<b>Age (Years)</b>		
1-20	62	26.2
21-40	75	31.6
41-60	65	27.4
≥60	35	14.8
<b>Gender</b>		
Male	160	67.5
Female	77	32.5
<b>Area of Residence</b>		
Urban	179	75.5
Rural	58	24.5
<b>Literacy status</b>		
Illiterate	93	39.2
Below Matric	87	36.7
Above Matric	57	24.1
<b>Occupation</b>		
Student	43	18.1
Housewife	33	13.9
Unemployed	57	24.1
Employed	79	33.3
Retired	25	10.5

**Table 2: Distribution of study participants according to their clinical profile**

Type of animal bite	Frequency	Percentage (%)
Dog	233	98.3

Continue.....

Rat	4	1.7
<b>Type of animal exposure</b>		
Pet	26	11.2
Stray	207	88.8
<b>Category of wound</b>		
Category I	2	0.8
Category II	54	22.8
Category III	181	76.4
<b>What is the first thing you did when you got bitten by a dog</b>		
Washed with water only	37	15.6
Washed with soap and water	121	51.1
Applied chilli on wound	79	33.3
<b>Awareness if the vaccine is given before animal bite for prevention of rabies</b>		
Yes	45	19.0
No	192	81.0
<b>Received all vaccines</b>		
As per scheduled	145	61.2
Delayed	92	38.8
<b>Day you got your 1<sup>st</sup>dose after exposure</b>		
Same day	96	40.5
Less than 7 days	102	43.0
≥7 days	39	16.5
<b>Tetanus toxoid taken along with 1<sup>st</sup> dose of ARV</b>		
Yes	202	85.2
no	35	14.8



**Figure 1: Source of information regarding anti-rabies vaccine**

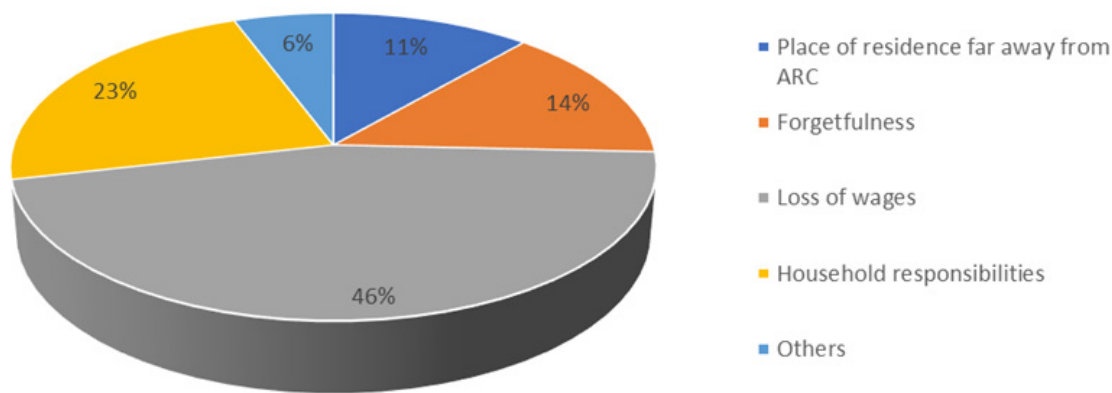


Figure 2: Reasons for delaying anti-rabies vaccine.

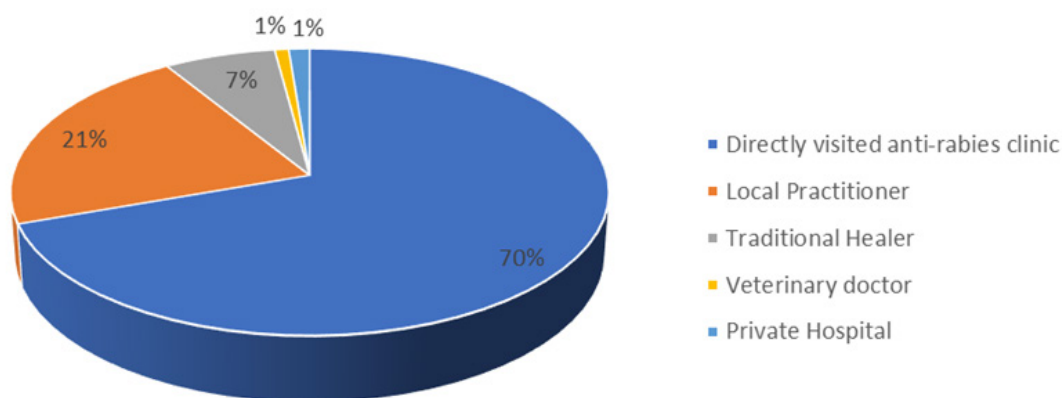


Figure 3: Treatment seeking behaviour of animal bite patients.

Table 3. Association of Anti-rabies vaccine compliance with sociodemographic factors.

Variable		Compliant(N=202) n (%)	Non Compliant(N=35) n (%)	P-value
Literacy status	Illiterate	73(36.1)	20(57.1)	$\chi^2 = 7.68$ df=2 P value=0.02
	Below Matric	81(40.1)	6(17.2)	
	Matric & Above	48(23.8)	9(25.7)	
Gender	Male	138(68.3)	22(62.9)	$\chi^2 = 0.405$ df=1 P value=0.524
	Female	64(31.7)	13(37.1)	
Area of Residence	Urban	175(86.6)	4(11.4)	$\chi^2 = 91.28$ df=1 P value=0.000
	Rural	27(13.4)	31(88.6)	
Occupation	Student	33(16.3)	10(28.6)	$\chi^2 = 7.44$ df=4 P value=0.114
	Housewife	27(13.4)	6(17.1)	
	Unemployed	52(25.7)	5(14.3)	
	Employed	71(35.2)	8(22.9)	
	Retired	19(9.4)	6(17.1)	
Age	1-20	52(25.7)	10(28.6)	$\chi^2 = 0.501$ df=3 P value=0.91
	21-40	63(31.2)	12(34.3)	
	41-60	57(28.2)	8(22.9)	
	≥60	30(14.9)	5(14.3)	

**Table 4. Practices of animal bite patients and their relation with sociodemographic factors.**

Variable		Washed with water only(N=37) n (%)	Washed with soap and water(N=121) n (%)	Applied irritable substances like: chili on wound, lime juice, turmeric(N=79) n (%)	P Value
Gender	Male	22(59.5)	91(75.2)	47(59.5)	$\chi^2 = 6.67$ df=2 P value=0.03
	Female	15(40.5)	30(24.8)	32(40.5)	
Literacy Status	Illiterate	14(37.8)	33(27.3)	46(58.2)	$\chi^2 = 26.13$ df=4 P value=0.000
	Below Matric	11(29.7)	49(40.5)	27(34.2)	
	Matric & Above	12(32.4)	39(32.2)	6(7.8)	
Area of Residence	Urban	18(48.6)	106(87.6)	55(69.6)	$\chi^2 = 25.50$ df=2 P value=0.000
	Rural	19(51.4)	15(12.4)	24(30.4)	
Occupation	Student	7(18.9)	25(20.7)	11(13.9)	$\chi^2 = 35.11$ df=8 P value=0.000
	Housewife	8(21.6)	6(5.0)	19(24.1)	
	Unemployed	7(18.9)	39(32.2)	11(13.9)	
	Employed	6(16.2)	41(33.9)	32(40.5)	
	Retired	9(24.4)	10(8.3)	6(7.6)	
Age	1-20	11(29.7)	37(30.6)	14(17.7)	$\chi^2 = 7.215$ df=6 P value=0.301
	21-40	13(35.2)	38(31.4)	24(30.4)	
	41-60	8(21.6)	28(23.1)	29(36.7)	
	≥60	5(13.5)	18(14.9)	12(15.2)	

## Results

A total of 237 animal bite patients visited the anti-rabies clinic during the study period of three months. The age group of animal bite patients showed variation from 1 year to 80 years. Mean age of patients came out to be  $37.4 \pm 19.9$  years. The animal bite patients comprised of 67.5% males and 32.5% females. Three fourth of animal bite patients belonged to urban area. Out of total animal bite patients 39.2% were illiterate. Occupational status of animal bite patients revealed that 18.1% were students, 13.9% were housewives, 33.3% were currently employed and 10% were retired. (Table-1)

Majority (98.3%) of animal bite patients were bitten by dog and most of the bites were by stray dog (88.8%). On the basis of WHO wound classification, around three fourth (76.4%) of bites were of category-III, 22.8% of bites were of category-II whereas 0.8% were of category-I. (Table-2)

Information regarding anti-rabies vaccine was provided by health workers (39%), mass media (28%), relatives (25%) and friends (8%). (Figure-1). Out of 237 animal bite patients, 202 were compliant to anti-rabies vaccine in accordance to operational definition whereas 35 were non-compliant. The reason for non

compliance with anti-rabies vaccine schedule were explored and main reason cited by majority of animal bite patients for delaying anti-rabies vaccine was loss of wages(46%). Other reasons were household responsibilities(23%), forgetfulness(14%), place of residence far away from anti rabies clinic(11%) and others(6%).(Figure-2).

As regards to practices observed among animal bite patients, half of the patients(51%) washed the wound with soap and water after being bitten by the animal, whereas 15.6% of the patients washed their wound with water. It was observed that one-third of patients applied chilies on wound after the bite. (Table-2).

Association of practices of animal bite patients with various sociodemographic factors revealed significant association with factors like gender, literacy status, residential area and occupation. (Table-4).

As regards to treatment seeking behaviour of animal bite patients, almost three-fourth(70%) of patients directly reported to anti-rabies clinic whereas rest of the patients reported to local practitioner(21%), traditional healer(7%), veterinary(1%) and private hospital(1%).(Figure-3).

In our study 40.5% of the patients got anti-rabies vaccine on the same day while 43% received the vaccine within one week. Surprisingly 6.5% got anti-rabies vaccine after one week. Maximum(85.2%) number of patients got vaccination of tetanus toxoid. (Table-2).

Association between anti-rabies vaccine compliance and sociodemographic factors like literacy status and residential area was found to be statistically significant, whereas no association was observed between compliance and other sociodemographic factors like gender, age and occupation.(Table-3).

## Discussion

In the present study most of the animal bite patients (59%) belonged to age group of 21-60 years. Similar findings were observed in another study conducted by Haradanhalliet.al where majority of animal bite patients belonged to 15- 59 years of age

group.<sup>10</sup> In our study 67.5% were males and 32.5% were females. Similarly in a study conducted in eastern India males were the predominant victims.<sup>11</sup> Three fourth of animal bite patients belonged to urban area. Out of total animal bite patients 39.2% were illiterate and 33.3% were currently employed.

Majority(98.3%) of animal bite patients were bitten by dog and most of the bites were by stray dog(88.8%). Similar finding were observed in a study conducted by Karmakaret.al<sup>12</sup> and Nishantet.al.<sup>13</sup> National data on animal bites also states that 96% of the rabies occur due to dog bites.<sup>14</sup> So the focus of Stray dog population control and management is on anti rabies vaccination of stray dogs and neutering of stray dogs<sup>5</sup>

On the basis of WHO wound classification, around three fourth(76.4%) of bites were of category-III, 22.8% of bites were of category-II whereas 0.8% were of category-I. Similarly in another study conducted in Karnataka Category III bites were reported in 77.1% of victims.<sup>15</sup>

Information regarding antirabies vaccine was provided by healthworkers(39%), massmedia(28%), relatives(25%) and friends(8%). In our study 40.5% of the patients got anti-rabies vaccine on the same day while 43% received the vaccine within one week. Surprisingly 6.5% got anti-rabies vaccine after one week. Maximum (85.2%) number of patients got vaccination of tetanus toxoid.

In our study compliance to full course of antirabies vaccine was found to be 85.2%. These findings are comparable with another crosssectional study conducted in Central India where 78% compliance was observed to ARV.<sup>16</sup> Similarly compliance to ARV was found to be 73.7% in another study conducted by Jenaet.al in Odisha.<sup>17</sup> Our results are consistent with the findings of study conducted by Shankaraiah et.al in Bangalore.<sup>18</sup>

The reason for noncompliance with antirabies vaccine schedule were explored and main reason cited by majority of animal bite patients for delaying anti-rabies vaccine was loss of wages(46%). Other reasons were household responsibilities (23%), forgetfulness(14%), place of residence far away from anti rabies clinic(11%) and others(6%). These results are consistent with the findings of studies

conducted by Shankaraiah et.al,<sup>19</sup> Panda et.al.<sup>20</sup> and Shivasakthimani.<sup>21</sup>

Correct practices were observed among half (51%) of the animal bite patients in our study whereas in another study conducted in Central India, where 41.7% patients followed correct wound management practices.<sup>16</sup> In our study harmful practices were observed among one-third of patients. Similarly such harmful practices were observed among animal bite victims in Karnataka (33.3%).<sup>15</sup>

As regards to treatment seeking behavior, our study revealed that almost three-fourth (70%) of animal bite patients directly reported to anti-rabies clinic. Same findings were observed in a study conducted in Ethiopia where 77.4% of suspected dog bite cases visited health facility directly to receive PEP.<sup>22</sup> In another study conducted in West Bengal 73.2% of the animal bite victims would like to visit the doctor.<sup>23</sup> In our study treatment seeking behavior was observed to be undesirable among 30% of animal bite victims. Similar health seeking behavior was observed among animal bite victims in a multicentric study conducted in six regional states.<sup>10</sup>

### Conclusion

The health seeking behavior regarding the recommended schedule of post exposure prophylaxis was not satisfactory. As vaccination is the only effective tool for prevention of rabies, still compliance was found to be inadequate in our study. The major constraint for non-compliance was observed to be social factors. Thus motivation is required through proper communication and behavioral change so as to complete the full course of post exposure prophylaxis in order to save human lives.

### Limitations

As Rabies immunoglobulin (RIG) was not available and it is costly so patients were not able to procure (RIG), so because of this we could not assess the compliance of RIG among animal bite patients.

**Conflict of Interest:** There is no conflicts of interest

**Source of Funding:** Nil

**Ethical consideration:** The ethical clearance was given by the Ethics committee of Sri Guru Ram Das institute of Medical sciences. (Ref. no. SGRD/IEC/2023-184)

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