

Original Research Article

# KNOWLEDGE REGARDING RABIES AND MANAGEMENT OF ANIMAL BITES AMONG GENERAL COMMUNITY IN REWA CITY

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## ABSTRACT

**Background:** Rabies is an important zoonotic disease, primarily of warm-blooded animals such as dogs, cats, jackals and wolves. 99% of death by rabies are caused by dog bites. Low socio-economic communities are affected mostly by this neglected tropical disease, which is 100% fatal but at the same time, entirely preventable. Objectives of the study are to assess knowledge regarding the modes of transmission of rabies, immediate management of animal bites and importance of vaccination amongst study population.

**Methods:** This community based, observational cross-sectional study was carried out in urban region of Rewa district, Madhya Pradesh. Out of 45 wards, 10 wards were selected randomly through lottery system. Then, from each ward 31/32 households were selected by systematic random sampling. Study population included 314 households. From each household 1 person aged >18 years were interviewed after taking consent, using a semi-structured questionnaire which included information regarding socio-demographic profile and knowledge about the Rabies and animal bites management. Data was entered in Microsoft excel and analysed by using SPSS version 20 Appropriate statistical tests were applied and results were obtained.

**Results:** 81.3% heard about rabies. 97.3 % of the participants were aware that stray dogs can transmit rabies and only 10% participants were aware that cows can also transmit rabies. 50.6% of the participants knew, transmission can occur only through the bite (single or multiple transdermal) of animals. 43.5% would wash the wound with soap and running water, out of which 17.1% knew that wound washing with running water should be done up to 15 minutes. Knowledge regarding rabies was found to be significantly associated with the education status of the participants.

**Conclusion:** Awareness programmes imparting knowledge among general population regarding transmission of rabies and its prevention is need of the hour for elimination of rabies.

**Keywords-** Rabies transmission, Animal bites, Wound washing, Vaccination.

## 1. Introduction:

Rabies is an important zoonotic disease, primarily of warm-blooded animals such as dogs, cats, jackals and wolves. Main host and transmitter of Rabies are dog.<sup>(1)</sup> An estimate of human deaths due to rabies is 55000 globally, in which majority occurs in South East Asian Region, accounting for 60 % of global deaths. 99% of death by rabies are caused by dog bites<sup>(2)</sup>. Rabid animal's mucous secretion such as saliva are the predominant source of rabies infection, often acquired through animal bites/scratches /licks on open wound or mucous membrane<sup>(3)</sup> The risk of getting rabies is higher in Indians (except for Island of Andaman and Nicobar and Lakshadweep) because of the presence of highest population of unvaccinated stray dogs / Free roaming dogs in the world. Low socio-economic communities are affected mostly by this neglected tropical disease, which is 100% fatal but at the same time, entirely preventable.<sup>(4)</sup> Recommendation by WHO is to vaccinate 70% of dogs population in order to eliminate dog rabies thus human rabies.<sup>(5)</sup> Also, awareness of the people has a significant role in the prevention of rabies infection. Ignorance and misconceptions regarding the immediate steps followed by animal bites, like application of red chilli powder/turmeric powder/Herbs and oils on wound for neutralizing the effect of infection are one of the major hurdles in the achievement of Rabies elimination. Rabies has 100% case fatality rate and death of an exposed person is inevitable once clinical symptoms appear, signifying the role of prevention. However, this situation can be managed /avoided by wound washing with soap and running water along with Post-exposure prophylaxis by administering Anti-Rabies Vaccine and Rabies Immunoglobulins in timely manner<sup>(6-8)</sup>.

### Objectives:

- 1.To assess knowledge regarding the modes of transmission of rabies.
2. To assess the awareness regarding immediate management of animal bites and importance of vaccination.

## 2. Materials and Methods-

### STUDY AREA AND STUDY SUBJECTS-

This community based, observational cross-sectional study was carried out in urban region of Rewa district, Madhya Pradesh. This District is distributed over an area of 6,314 km<sup>2</sup>. According to Census 2011, total population of Rewa is 2,363,744 in which 395,487 people live in urban region and 1,968,257 in rural region. The study subjects were the residents of the urban region of the district, age above 18years of both the genders.

### SAMPLE SIZE ESTIMATION-

The approximate sample size estimated using formula

$$N = [3.84 * p * q] / L^2 = [3.84 * p * (100 - q)] / L^2$$

$$= 3.84 * 55 * 45 / 5.5 * 5.5 \quad [ 9504 / 30.25 ]$$

$$= 314$$

Here N is sample size

p is the prevalence of awareness of community regarding rabies ( 55%) from a study (1)

q = (100-p)

L is allowable error (10% of p in proposed study)

**SAMPLING METHOD-**

There are 45 Municipal corporation wards in urban Rewa. Out of which, 10 wards were selected randomly through lottery system. Then, from each ward 31/32 households were selected by systematic random sampling. Study population included 314 households.

**STUDY VARIABLES-**

- 1- Socio-demographic profile of the participant, age, sex, education, occupation and socioeconomic status
- 2- Knowledge regarding Rabies such as- its modes of transmission, wound management, symptoms and post exposure prophylaxis.

**ETHICAL CLEARANCE-**

The study was started after getting approval from institutional ethical committee. It is descriptive cross-sectional study conducted using questionnaire as a study tool, which was administered after taking informed consent of the participants. Invasive procedures were not the part of our study

**DATA COLLECTION –**

From each household, one member of >18 years of age was selected for taking interview. A semi-structured questionnaire regarding socio-demographic profile and knowledge of rabies was used for data collection. Modification of the questionnaire was being done after pretesting it. Questionnaire was administered only to those, who had given consent to participate in this study.

**DATA ANALYSIS-** Data was entered in Microsoft excel and analysed by using SPSS version 20. Appropriate statistical tests were applied and results were given in terms of frequencies. A Chi-square test was used and association between demographic variables (gender and education) and knowledge was taken out. The results obtained with P value <0.05 were considered as statistically significant

**3. Results:**

Sociodemographic profile of the study participants-

Total number of participants interviewed in our present study were 314. Out of total, males comprised 58.9%, whereas females were 41.1%. According to the age-wise distribution, 49% participants were observed in the age group of 18-30 years followed by 30% and 21% in the > 45 years and 31-45 years respectively. Of all the participants, majority (64.9%) were educated above senior secondary school. Regarding occupation, 44.9% had jobs in Government or Private sectors and 28.9% were students. 61.1% of the participants belonged to below poverty line. [Table 1]

<b>Table 1: Sociodemographic profile of the participants</b>		
<b>Variables</b>	<b>Frequency(n=314)</b>	<b>Percentage (%)</b>
<b>GENDER</b>		
Male	185	58.9 %
Female	129	41.1
<b>AGE (IN YEARS)</b>		

18-30	154	49
31-45	66	21
>45	94	30
<b>EDUCATION</b>		
Illiterate	9	3
1 <sup>st</sup> -8 <sup>th</sup> class	52	16.5
9 <sup>th</sup> -12 <sup>th</sup> class	49	15.6
>12 <sup>th</sup> Pass	204	64.9
<b>OCCUPATION</b>		
Student	91	28.9
Home maker	47	15.1
Daily wages laborer / Agriculture worker	35	11.1
Employed (Government job/ Private job/ self-employed)	141	44.9
<b>SOCIOECONOMIC STATUS</b>		
Below Poverty Line	192	61.1
Above Poverty Line	122	38.9

Knowledge of the participants regarding Rabies transmission-

Out of 314 participants, 255 (81.3%) heard about rabies. Majority of the participants were aware that stray dogs can transmit rabies (97.3%), less (10%) respondents were aware that cows can also transmit rabies. Amongst dogs, only (42.2 %) knew that pet dogs if vaccinated can also transmit rabies. Only (3.9%) knew that licks on broken skin can cause transmission of rabies, 50.6% of the participants knew, transmission can occur only through the bite of animal (single or multiple transdermal), followed by scratch without bleed (43.1%). Only (29.7%) of the participants knew that both dogs and cats should be observed for symptoms of rabies in case of exposure, whereas majority (63.8%) were aware only about dogs. (39.1%) knew that observation for 10 days should be done. [Table 2]

**Table 2: Knowledge of the participants regarding Rabies transmission-**

<b>Knowledge</b>	<b>Frequency(n=314)</b>	<b>Percentage(%)</b>
<b>Have you ever heard about Rabies?</b>		
Yes	255	81.3
No	59	18.7
<b>Animal/s by whom, rabies can be transmitted. * (n= 255)</b>		
Pet dogs	108	42.2
Stray dogs	249	97.3
Cats	152	59.4
Wild animals / wild rodents	201	78.5
Horse	59	23
Cow	26	10.2
<b>After which animal's bite, treatment should be taken? * (n=255)</b>		
Pet dogs	108	42.2
Stray dogs	249	97.3

<b>Cats</b>	152	59.4
<b>Wild animals / wild rodents</b>	201	78.5
<b>Horse</b>	59	23
<b>Cow</b>	26	10.2
<b>Transmission of rabies by rabid animal can occur through? (n=255)</b>		
<b>Lick or touch on intact skin</b>	6	2.4
<b>Scratch without bleed</b>	110	43.1
<b>Lick on broken skin</b>	10	3.9
<b>Bite/s only</b>	129	50.6
<b>Don't know</b>		
<b>Which animal/s should be observed for rabies symptoms in case of bite? (n=255)</b>		
<b>Only dogs</b>	162	63.8
<b>Only cats</b>	5	2.1
<b>Both dogs and cats</b>	76	29.7
<b>Don't know</b>	12	4.4
<b>Observation should be done for how many days? (n= 243)</b>		
<b>7days</b>	71	29.2
<b>10 days</b>	95	39.1
<b>30 days</b>	20	8.2
<b>Don't know</b>	57	23.5
<b>What are the symptoms of animal infected with rabies? *</b>		
<b>Excessive salivation</b>	216	84.7
<b>Aggressive behaviour</b>	246	96.4
<b>Run amok</b>	213	83.4
<b>Bite without provocation</b>	227	89.1
<b>Paralysis / dumb rabies</b>	130	40.4

Note- \* multiple response

Knowledge of the participants regarding management of rabies-

Out of 255 participants who have heard about rabies, majority (74.5%) of the participants were in favour of immediate initiation of treatment, while 2.8% had no idea about it. 43.5% would wash the wound with soap and running water followed by application of alcohol / antiseptic without washing the wound with water (21.2%). Direct application of indigenous materials like red chilli powder, turmeric powder etc was chosen 13.7 % of the respondents. Only 17.1% of the participants knew that wound washing with running water should be done up to 15 minutes. 93.7% knew that rabies is a fatal disease while 83.1 % knew that it is preventable too. 59.6% thinks that risk of fatality is equal for all the sites in body. According to the majority of the participants (65.6%) wound should not be kept open. [Table 3]

**Table 3: Knowledge of the participants regarding management of rabies-**

<b>Knowledge</b>	<b>Frequency (n=255)</b>	<b>Percentage(%)</b>
<b>In case of animal bite/s, treatment should be started?</b>		
<b>Immediately</b>	190	74.5
<b>After 10 days</b>	58	22.7
<b>Don't know</b>	7	2.8
<b>What do you think should be the next step following animal bite?</b>		
<b>Wash the wound with soap and running water</b>	111	43.5
<b>Directly go to the hospital without doing anything</b>	30	11.8
<b>Wait for 10 days and then go to hospital</b>	25	9.8
<b>Directly apply indigenous material like red chilli powder, mud, turmeric powder etc</b>	35	13.7
<b>Directly apply antiseptic/ alcohol without washing the wound</b>	54	21.2
<b>What is the desirable time period for washing the wound with running water? (n=111)</b>		
<b>2-3 minutes</b>	80	72.1
<b>Up to 15 minutes</b>	19	17.1
<b>Don't know</b>	12	10.8
<b>In which case, anti-rabies vaccines should be taken?</b>		
<b>Exposure with provoked animal</b>	14	5.5
<b>Exposure with unprovoked animal</b>	8	3.2
<b>Exposure with both provoked and unprovoked</b>	233	91.3
<b>Do you think anti- rabies vaccine is safe for</b>		
<b>Pregnant lady?</b>		
<b>Yes</b>	203	79.6
<b>No</b>	52	20.4
<b>Infants?</b>		
<b>Yes</b>	228	89.4
<b>No</b>	27	10.6
<b>Old age with comorbidities?</b>		
<b>Yes</b>	225	88.2
<b>No</b>	30	11.8
<b>Is rabies fatal?</b>		
<b>Yes</b>	239	93.7
<b>No</b>	4	1.6
<b>Don't know</b>	12	4.7
<b>Is rabies preventable</b>		
<b>Yes</b>	212	83.1

No	10	3.9
Don't know	33	13.0
<b>How many doses are there in anti-rabies vaccine? (With no previous vaccination)</b>		
3	75	29.5
4 or 5	131	51.3
14	31	12.2
Don't know	18	7.0
<b>Bite on which site have a higher risk of fatality?</b>		
Legs	11	4.3
Hands	4	1.6
Face	78	30.5
Equally all	152	59.6
Don't know	10	4.0
<b>Do you think, wound should be kept open?</b>		
Yes	88	34.5
No	167	65.5

**Table 4: Association between knowledge and gender**

Variables	Gender	N	Frequency	X <sup>2</sup>	p value
<b>Heard of Rabies</b>	Male	185	152	0.26	0.6
	Female	129	103		
<b>Pet dogs can transmit rabies.</b>	Male	152	62	0.37	0.53
	Female	103	46		
<b>Stray dogs can transmit rabies</b>	Male	152	148	0.014	0.9
	Female	103	101		
<b>Cows can transmit rabies</b>	Male	152	19	2.25	0.13
	Female	103	7		
<b>Transmission of rabies can occur through scratch without bleed</b>	Male	152	75	5.9	0.15
	Female	103	35		
<b>Transmission of rabies can occur through lick on broken skin</b>	Male	152	5	0.39	0.52
	Female	103	5		

<b>Observation should be done in case of dogs and cats for 10 days</b>	Male	145	53	0.97	0.32
	Female	98	42		
<b>Immediate washing of wound with soap and running water</b>	Male	152	68	0.22	0.63
	Female	103	43		
<b>Up to 15 minutes under running water</b>	Male	68	9	1.86	0.17
	Female	43	10		
<b>4/5 doses of ARV are given.</b>	Male	152	77	0.07	0.78
	Female	103	54		
<b>Face has a higher risk of fatality</b>	Male	152	46	0.018	0.89
	Female	103	32		
<b>Wound should be kept open.</b>	Male	152	46	3	0.08
	Female	103	42		

**Table 5: Association between knowledge and education-**

Variables	Education	N	Frequency	X <sup>2</sup>	p value
<b>Heard of Rabies</b>	Illiterates/Primary/middle/higher secondary school.	110	60	78.8	0.00001
	Graduates/ Postgraduates	204	195		
<b>Pet dogs can transmit rabies.</b>	Illiterates/Primary/middle/higher secondary school.	60	37	12.5	0.004
	Graduates/ Postgraduates	195	70		
<b>Stray dogs can transmit rabies</b>	Illiterates/Primary/middle/higher secondary school.	60	54	15.4	0.000084
	Graduates/ Postgraduates	195	194		
<b>Cows can transmit rabies</b>	Illiterates/Primary/middle/higher secondary school.	60	4	1.06	0.3
	Graduates/ Postgraduates	195	22		
<b>Transmission of rabies can occur through scratch without bleed</b>	Illiterates/Primary/middle/higher secondary school.	60	26	0.001	0.97
	Graduates/ Postgraduates	195	84		
<b>Transmission</b>	Illiterates/Primary/middle/higher	60	1	1.05	0.3

<b>of rabies can occur through lick on broken skin</b>	secondary school.				
	Graduates/ Postgraduates	195	9		
<b>Observation should be done in case of dogs and cats for 10 days</b>	Illiterates/Primary/middle/higher secondary school.	49	17	0.49	0.47
	Graduates/ Postgraduates	194	78		
<b>Immediate washing of wound with soap and running water</b>	Illiterates/Primary/middle/higher secondary school.	60	13	15.2	0.00009
	Graduates/ Postgraduates	195	98		
<b>Up to 15 minutes under running water</b>	Illiterates/Primary/middle/higher secondary school.	13	2	0.031	0.85
	Graduates/ Postgraduates	98	17		
<b>4/5 doses of ARV are given.</b>	Illiterates/Primary/middle/higher secondary school.	60	18	14.3	0.00015
	Graduates/ Postgraduates	195	113		
<b>Face has a higher risk of fatality</b>	Illiterates/Primary/middle/higher secondary school.	60	10	7.16	0.007
	Graduates/ Postgraduates	195	68		
<b>Wound should be kept open.</b>	Illiterates/Primary/middle/higher secondary school.	60	31	10.2	0.0013
	Graduates/ Postgraduates	195	57		

#### 4. Discussion:

The purpose of this study was to assess the knowledge of general population regarding transmission and preventive measures of rabies. This study showed that, 81.3% of the participants had heard of rabies but only 42.2% of them knew that pet dogs can also transmit rabies. Majority (97.3%) of them thought that stray dogs can cause rabies. There was a significant association between the education level of the participants and their knowledge regarding rabies transmission and prevention ( $P < 0.004$ ). 93.7% of the participants mentioned rabies as a fatal but preventable disease. Similar results are shown in a study done by Tenzin et al. <sup>(9)</sup>, where 89.6% of respondents heard of rabies and majority believed that it is a fatal disease. Knowledge of participants regarding transmission of rabies by other animals such as cats was higher (59.4%) in this study as compared to another study <sup>(8)</sup>. In same study by Singh and Choudhary et al. <sup>(8)</sup>, 24.4 % of participants were aware of bite on danger sites such as face, neck or head which is comparable to our study wherein only 30.5 % participants knew that animal bites on face have a higher risk of fatality .

Regarding the modes of transmission of rabies by animals, 50.6 % respondents mentioned that 'only bites' are responsible for rabies, followed by scratch without bleed (43.1%) whereas, only 3.9 % knew that lick on broken skin can also be one of the modes of transmission. These results were similar to a study done by Nejash et al. <sup>(6)</sup>, where dog bite was considered as a mode of transmission of rabies by 51.9% of the participants. However, saliva contact on open wound was observed by 8.9% of the participants which was higher as compared to our study.

Washing of wound with soap and water was preferred option after animal bite among 43.5% of the participants, whereas 13.7% considered application of indigenous material such as turmeric powder, red chilli powder etc., on wound following animal bite. A study done by Herbert et al. <sup>(2)</sup> showed similar results where, only 50% of the residents knew that wound should be washed with soap and running water after animal bite. Application of turmeric powder and oil was mentioned by 13.5% of the residents. In a study by Tandon et al.<sup>(10)</sup>, 64% of the participants mentioned the option of washing wound with soap and running water after animal bite, whereas, 36.2 % of the participants opted for the same in another study by Sivagurunathan C, et al. <sup>(4)</sup>.

This study showed that there is huge knowledge gap and misconceptions regarding transmission and prevention of rabies in the community. Awareness campaigns should aid them in breaking the barrier to treat animal bites and health educate the community consistently.

## 5. Conclusion:

Rabies is a fatal, although completely preventable zoonotic disease. Despite the fact it is completely preventable, still many lives are claimed by this disease every year, particularly in developing country like India. There is significant knowledge gap regarding preventive measures for rabies among the general population which also gets reflected in our study findings. Awareness programmes imparting knowledge among general population regarding transmission of rabies and its prevention is need of the hour for elimination of rabies.

## 6. References:

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