

Community Awareness and Risk of Rabies Associated with Exposure to Animals in India

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Abstract

Background: Rabies is a fatal but preventable disease. Around the world, awareness studies about rabies have been widely used to understand the disease and in its preventive measures. **Objectives:** The present study was conducted to assess the awareness of rabies as a disease, its transmission, and prevention among the general population and also to assess the perceived health risks associated with exposure to animals. **Methods:** A cross-sectional study was undertaken across seven representative states in India between July and November 2017. Multistage sampling methodology was followed to select 1012 households as the primary sampling unit, and one adult responsible respondent from each household was interviewed as study participants. **Results:** Six hundred and eleven (60.4%) participants had heard of rabies. Only 0.2% had extensive knowledge of rabies. Majority (440, 72.0%) of the participants considered rabies as a fatal disease; 77.3% opined that risk of rabies from dogs was high compared to 41.6% who believed that there was little or no risk of rabies from cats. Only 37 (3.7%) participants were aware about preexposure prophylaxis. **Conclusion:** The awareness on rabies and its prevention in the study population was not satisfactory.

Key words: Awareness, dog bite, health risk, India, rabies

INTRODUCTION

Rabies is a fatal but preventable disease. Canine rabies remains a major public health problem in developing countries, claiming an estimated 55,000 human lives each year.^[1,2] India reports 20,000 rabies deaths and 17.4 million animal bites every year.^[3] One of the reasons attributed for such high numbers is lack of awareness in the population about rabies and its prevention. Community awareness about rabies is very crucial in rabies prevention and control.^[4] Knowledge, attitudes, and practice (KAP) studies on rabies have been widely used around the world, and the knowledge gained helps in changing attitudes and practices to minimize disease burden.^[5-7] KAP surveys identify knowledge gaps, cultural beliefs, and behavior patterns that may pose barriers to control the disease. Awareness survey helps in designing relevant public health awareness campaigns and baseline data for planning, implementation, and evaluation of national control programs.

Awareness surveys among communities can be used to evaluate the underlying burden of animal bites in the community and describe human interactions with dogs and wild animals. The hope is to discover possible weaknesses in knowledge among

local communities and the perception of risks associated with animal bite injuries and rabies. These data will be used to develop effective risk communication materials.^[8]

This study was conducted with the objectives to assess the awareness of rabies as a disease, its transmission, and prevention among the study participants and also to assess the perceived health risk associated with exposure to animals.

MATERIALS AND METHODS

Study design and subjects

A descriptive observational study with cross-sectional design was conducted among the population across seven representative states in India between July and November 2017. The selected states were Kerala, Gujarat, Himachal Pradesh, Bihar, Nagaland, West Bengal, and Madhya Pradesh.

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Sampling

A multistage random sampling methodology was followed for the selection of one district from each state, taluka/tehsil/block from each district, and six clusters within the block/taluka/tehsil, i.e., wards in urban areas and villages in rural areas. The primary sampling unit was a household. It was decided to include 24 households from each cluster and around 144 households from each state. However, finally, a convenience sample of 1012 households could be studied. The World Health Organization's Expanded Program on Immunization cluster evaluation survey methodology was followed for the selection of the household.^[9] At the last stage, the head of the households or any adult responsible respondents from each household were recruited as study participants and interviewed. Respondents should have been a resident of the household for a minimum of 6 months in the last 1 year and those who gave informed consent for participation.

Study tools/technique

Data collection

The study tool was designed based on consultation with researchers who had conducted KAP surveys elsewhere. The pretested study tool was semi-structured with both open- and closed-ended questions and captured details of individual and household characteristics that were used to assess socioeconomic status and education levels. Additional questions covered were knowledge of rabies, including a description of the disease, mode of transmission, outcome, and perceived risk from animal bites.

Data were collected at the household level by a community survey team from the respective states. The faculty of the department of community medicine of a medical college situated in the selected district or the nearest medical college in the neighboring district within the state formed the community survey team.

Operational definitions and analysis

Awareness of rabies:

(i) Little knowledge of rabies meant having heard of rabies/dog disease but could not identify transmission routes or severity of disease; (ii) Basic understanding of rabies denoted knowledge that rabies is both a highly fatal disease and is transmitted by dog bite; and (iii) Extensive knowledge of rabies indicated basic understanding plus knowledge of other routes of exposure and wildlife reservoirs besides dogs. The perceived risk of rabies was measured using a 5-point Likert scale, with 1 being little or no risk and 5 being high risk. Data were analyzed in terms of frequencies and proportions. The analysis was performed using Statistical package stata 12.1, Stata Corp LP college station, Texas, USA.^[10]

Ethical aspects

Ethics Committee reference number and date of approval was KIMS/IEC/S15-2016. Informed signed consent (or thumb impression from the illiterates with witness) was obtained from all participants. Confidentiality of the data was maintained.

RESULTS

The median age (interquartile range) of the participants was 40 (30–52) years. The age range of the participants was from 18 to 88 years. Table 1 describes the sociodemographic characteristics of the study participants.

Six hundred and eleven (60.4%) participants had heard of rabies, 394 (38.9%) participants had little knowledge of rabies, 215 (21.2%) had basic understanding of rabies, and only 2 (0.2%) had extensive knowledge of rabies, as depicted in Table 2. Majority (440, 72.0%) of the participants considered

Table 1: Sociodemographic characteristics of the study participants (n=1012)

Characteristics	Details	Urban (n=323), n (%)	Rural (n=689), n (%)	Total (n=1012), n (%)
Gender	Male	145 (44.9)	338 (49.1)	483 (47.7)
	Female	178 (55.1)	351 (50.9)	529 (52.3)
Literate	Illiterate	17 (5.3)	160 (23.2)	177 (17.5)
	Nonformal literate	49 (15.2)	137 (19.9)	186 (18.4)
	Formal literate	257 (79.5)	392 (56.9)	649 (64.1)
Occupation	Cultivator/laborer (agricultural/nonagricultural)	28 (8.7)	266 (38.6)	294 (29.1)
	Salaried employment/business	128 (39.6)	113 (16.4)	241 (23.7)
	Housework	122 (37.8)	242 (35.1)	364 (36.0)
	Unemployed	35 (10.8)	41 (6.0)	76 (7.5)
	Student	10 (3.1)	27 (3.9)	37 (3.7)
Religion	Hindu	205 (63.5)	520 (75.5)	725 (71.6)
	Christian	69 (21.4)	124 (18.0)	193 (19.1)
	Muslim	47 (14.5)	45 (6.5)	92 (9.1)
	Others (Jain and Sikh)	2 (0.6)	-	2 (0.2)
Toilet facility	Sanitary/pit/bore hole	319 (98.8)	595 (86.4)	914 (90.3)
	No facility/open defecation	4 (1.2)	94 (13.6)	98 (9.7)
Material of the roof of house	Finished roof/rudimentary roof	318 (98.5)	579 (84.0)	897 (88.6)
	Natural roof (thatch)	5 (1.5)	110 (16.0)	115 (11.4)
Material of the wall of house	Brick with cement/stone/wood/bamboo	286 (88.5)	483 (70.1)	769 (76.0)
	Brick with mud/mud	37 (11.5)	206 (29.9)	243 (24.0)

Figures in parenthesis indicate percentage

Table 2: Awareness on rabies among the participants (n=1012)

Characteristics	Details	Urban (n=323)	Rural (n=689)	Total (n=1012)
Heard of disease called rabies	Yes	222 (68.7)	389 (56.5)	611 (60.4)
Rabies awareness how much have you heard	Never heard of rabies	101 (31.3)	300 (43.5)	401 (39.7)
	Little knowledge	128 (39.6)	266 (38.6)	394 (38.9)
	Basic understanding	94 (29.1)	121 (17.6)	215 (21.2)
	Extensive knowledge	-	2 (0.3)	2 (0.2)
Severity of disease (n=611)	n	222	389	611
Among participants who had heard of rabies	Fatal	144 (64.9)	296 (76.1)	440 (72.0)
	Curable	46 (20.7)	47 (12.1)	93 (15.2)
	Mild	2 (0.9)	10 (2.5)	12 (2.0)
	Do not know	30 (13.5)	36 (9.3)	66 (10.8)
Transmission of rabies (n=611)*	Bite	205 (92.3)	361 (92.8)	566 (92.6)
	Scratch	76 (34.2)	206 (52.9)	282 (46.2)
	Contact with saliva	66 (29.7)	151 (38.8)	217 (35.5)
	Contact with blood	17 (7.8)	76 (19.4)	93 (15.2)
	Touching the animal	11 (5.0)	15 (3.8)	26 (4.3)
	Do not know	11 (5.0)	11 (2.8)	22 (3.6)

*Multiple response. Figures in parenthesis indicate percentages

rabies as a fatal disease and 93 (15.2%) participants mentioned rabies as curable. Five hundred and sixty-six (92.6%) participants mentioned that humans get rabies by bite, 282 (46.2%) mentioned by scratch, and 217 (35.5%) contact with saliva.

Of the 1012 participants, 232 (22.9%) had informed that they would wash the wound with water and soap if they were bitten by a dog that they do not recognize or own and 58 (5.7%) participants had informed that they would apply irritants/traditional medicines. Six hundred and forty-three (63.5%) participants said that they would actively seek care at medical facility/rabies postexposure prophylaxis (PEP) and 96 (9.5%) opined that they would do nothing. On the other hand, with regard to dog responsible for the exposure, 343 (33.9%) participants had said that they would kill the dog, 98 (9.7%) said about isolating the dog, 19 (1.9%) said informing concerned officials/municipality/panchayat/veterinarian, and majority (495, 48.9%) of participants had said that they would do nothing to the dog.

Among the 611 participants who had heard of rabies, majority (472, 77.3%) informed that risk of rabies in dogs was high and only 29 (4.7%) participants informed that there was little or no risk. Likewise, for cats, 254 participants (41.6%) informed that there was little or no risk of rabies and 136 (22.3%) informed that risk of rabies was high. Similarly, the perceived risk of rabies from mongoose, rodents, monkey, bats, livestock, wild birds, and snake are given in Table 3.

Thirty-seven (3.7%) participants were aware about preexposure prophylaxis; among them, 20 (54.1%) participants mentioned that three doses should be taken and 3 (0.3%) participants had actually taken preexposure rabies vaccination. Of the 1012 participants, 548 (54.2%) informed that they were not aware of rabies PEP, 225 (22.2%) informed lack of facilities/medicines to avail it, 138 (13.6%) informed that

Table 3: Perceived risk for rabies associated with animals among the study participants

Animal	Risk of rabies (n=611) (1=little to no risk and 5=high risk)				
	1	2	3	4	5
Dog	29 (4.7)	9 (1.5)	54 (8.8)	47 (7.7)	472 (77.3)
Cat	254 (41.6)	40 (6.5)	88 (14.4)	93 (15.2)	136 (22.3)
Mongoose	401 (65.7)	64 (10.5)	54 (8.8)	29 (4.7)	63 (10.3)
Rodents	379 (62.0)	52 (8.5)	37 (6.1)	43 (7.0)	100 (16.4)
Monkey	317 (51.9)	39 (6.4)	66 (10.8)	63 (10.3)	126 (20.6)
Bats	445 (72.8)	45 (7.4)	35 (5.7)	36 (5.9)	50 (8.2)
Livestock	440 (72.0)	56 (9.2)	43 (7.1)	40 (6.5)	32 (5.2)
Wild birds	471 (77.1)	63 (10.3)	30 (4.9)	13 (2.1)	34 (5.6)
Snake	522 (85.4)	27 (4.4)	15 (2.5)	9 (1.5)	38 (6.2)

Figures in parenthesis indicate percentage

there was no obstacle/nothing, and 125 (12.4%) gave other reasons such as fear of injection, waiting time, traditional healer, cost, cannot miss work, and no transport as the obstacles for rabies prophylaxis.

DISCUSSION

In the current study, the percentage of participants who had heard of rabies was less compared to other studies which ranged from 68% to 99%.^[5,6,11-14] Similarly, participants with either basic, little or extensive knowledge of rabies were very few (<1%) compared to 37% classified as knowledgeable on rabies in a study in Tanzania.^[15] The level of awareness on rabies was high (90%) among pet owners in Sri Lanka,^[15] and several factors, notably personal experience with rabies, had been observed to have effect on knowledge in a study done in Bohol.^[14] Personal contact (70%) was the most common source of information about rabies at a school in Tanzania.^[5] Awareness on rabies disease in the general population can be

increased by activities such as World Rabies Day, awareness campaigns, and educational video on rabies in the regional language as pointed out in several studies.^[16-19]

In different study settings, majority of the participants (81%–86%) knew that rabies was transmitted through bites of suspect rabid animals similar to findings of the present study.^[5,12,19] About 23% had knowledge on transmission of rabies by scratches and licks which was similar to the present study.^[20,21] About 20% of the participants were able to name three or more types of animals capable of transmission of rabies in the present study, compared to 7% in Tanzania.^[5]

In the present study, washing the wound with soap and water as well as rabies vaccination had got importance, but role of rabies immunoglobulin was not appreciated. The importance of washing wounds with soap and water ranged from 8% to 66% in studies from different settings.^[5,9,10,19,22,23] Application of indigenous products such as chillies (11.4%), turmeric (5.6%), lime (6.8%), kerosene oil (2.3%), and herbal paste (4.2%) was suggested along with visit to occult medicine practitioner (1.5%) for wound management in several studies.^[9,20,24] The present study had a similar observation. Improved awareness on wound management, especially prompt flushing with any liquid available, would have a considerable impact on the prevention of rabies.^[25]

Fatal nature of the disease was known by only 50% in the present study compared to 40%–79% being aware about fatality as evident in few studies.^[5,6,12,15]

Participants seeking treatment from a doctor or a hospital after being bitten by a dog were less in the present study compared to the study from Sri Lanka (96%) but were higher than participants (38.8%) seeking treatment in Ethiopia.^[15,12] A sizable portion of the study participants (55.0%–90.0%) knew that a vaccine for rabies prevention was available in the different study settings similar to the present study.^[19,20,22] A study in Tanzania showed that 83% claimed that they would seek medical care immediately after a bite, 3% within 2 weeks of being bitten, and 12% after 2 weeks similar to the present study.^[5] In another study in Tanzania, 25.3% of probable rabies-exposed persons did not seek care, citing both costs and lack of awareness about rabies.^[26]

Seventy-nine percent of participants informed that they would kill the animal, 7%–18% said would report to livestock office, and <1% were aware of laboratory diagnostic confirmation in Tanzania and Bohol, which differed from the finding of the present study.^[5,14] The participants from the urban areas were more likely to submit the head of an animal for rabies evaluation (69%) compared with those from the rural areas (57%).^[15]

CONCLUSION

In the present study, even though more than fifty percent of the participants had heard about rabies and were aware of its transmission through dog bites, but their knowledge about the

disease and prevention was superficial. There is a need for effective mass media campaign to educate the population so as to prevent, control, and eventually eliminate the disease by 2030.

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Conflicts of interest

There are no conflicts of interest.

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