

Full Length Research Paper

Study on community knowledge, attitude and practice of rabies in and nearby Gondar town, North West Ethiopia

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Rabies is one of the disastrous diseases for both animal and human beings. Questionnaire based cross-sectional study was conducted in and nearby Gondar town from November 2013 to June 2014. A semi-structured questionnaire was administered to 139 respondents comprised of 96 from urban and 43 from peri-urban areas to assess knowledge, attitude and practice of community about rabies. The current study generally illustrated the presence of significant difference on knowledge and practice of the respondent from urban and peri-urban areas ($P < 0.05$). Although more than (96%) of the respondents were familiar with the disease, there is mis-perception about the cause and means of transmission of the disease. Starvation and thirst were mentioned by (49.6%) of the respondents as causes of the disease in dogs and 21.6% of them stated any type of contact (irrespective of the skin condition) with saliva of affected individual can transmit the diseases. The result also established that 124 (91.9%) of the respondents were aware that human and other different species of domestic animals can be affected by rabies. However, all respondents (100%) in peri-urban area perceived dog as the only source of infection for human being. Traditional medicine was stated as method of treatment in case of dog bite by 46% of the respondents whereas, 41.7% of respondent used post exposure vaccination. Only 35.8% of the respondent did vaccinate their dogs and level of low vaccination practice was higher in peri-urban area. Raising awareness about dog vaccination and improving access and affordability of the vaccine should be considered in control of the disease.

Key words: Attitude, dog, Gondar, knowledge, practice, rabies.

INTRODUCTION

Rabies is a deadly disease for both animal and human beings. Rabies is a viral disease transmitted by the bite or scratch from a rabid animal (World Health Organization (WHO), 2011). Rabies virus infects the

central nervous system, causing encephalopathy and ultimately death. The virus is a single stranded RNA virus belonging to the genus *Lyssavirus* of the family Rhabdoviridae (Sherikar et al., 2011).

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Rabid dogs are the principal source for transmission to human (Williams and Barker, 2001). Transmission almost always occurs by an animal bite that inoculates virus into wounds. Virus inoculated into a wound does not enter the bloodstream but is taken up at a nerve synapse to travel to the brain, where it causes encephalitis. The virus may enter the nervous system fairly rapidly or may remain at the bite site for an extended period before gaining access to the nervous system. The approximate density of nerve endings in the region of the bite may increase the risk of developing encephalitis more rapidly. Rarely, the virus can be transmitted by exposures other than bites that introduce the agent into open wounds or mucous membranes (Sherikar et al., 2011). It is manifested by motor irritation with clinical signs of mania and an attack complex, salivation, inability to swallow and by a progressive ascending paralysis beginning in the pelvic limbs and moving forward to the trunk and thoracic limbs and death (CFSPH, 2009). Diagnosis of rabies can be made based on history of bite, clinical signs and laboratory investigations (Warner et al., 1997). The method of laboratory investigation of rabies virus comprises isolation and identification of the agent, immunological tests, serological tests and molecular techniques (Kang et al., 2007).

Rabies is endemic in developing countries of Africa and Asia. The disease causes heavy losses in human and livestock population in the endemic region. Rabies infection has a case fatality rate of almost 100%, it accounts for over 55,000 human deaths annually, with most cases in Asia and Africa (WHO, 2011). About 98% of human rabies deaths have been documented to have been caused by almost and always bite of a rabid dog (Rupprecht, 2008). The annual cost of rabies in Africa and Asia was estimated at US\$ 583.5 million, most of which is due to cost of post exposure prophylaxis (PEP) (Knobel et al., 2005).

In Ethiopia, rabies is an important disease that has been recognized for many centuries (Fekadu, 1982) and rabies remains to be one of the most feared highly endemic infectious diseases. The annual death due to rabies was estimated to be 10,000, which makes it to be one of the worst affected countries in the world (Knobel et al., 2005). The presence of high population of dogs with poor management contributes for high endemicity of canine rabies in Ethiopia (Paulos et al., 2003). In canine rabies endemic countries like Ethiopia, rabies has also significant economic importance by its effect on livestock, and in Africa and Asia, the annual cost of livestock losses as a result of rabies is estimated to be US\$ 12.3 million (Knobel et al., 2005).

Prevention and control can be achieved by strict quarantine measures, elimination of stray dogs, extension program, control of rabies in wild life, registration of dogs and prophylactic vaccination. Poor public awareness towards rabies is one of the major obstacles in any prevention and control scheme of the disease, especially in rabies endemic countries like Ethiopia. Understanding

communities' awareness of cause, mode of transmission, symptoms, treatment and possible intervention measures of rabies is an important step towards developing strategies aimed at controlling the disease and determining the level of implementation of planned activities in the future. Therefore, this study was designed to assess the level of knowledge, attitude and practices of prevention and control of rabies.

MATERIALS AND METHODS

Study design and population

A community based cross-sectional study design was used to assess the knowledge, attitude and practice of the community on rabies using semi-structured questionnaire by face to face interview to randomly selected respondents. The study populations were residents of Gondar town and its surrounding.

Sample size and sampling methods

The sample size was calculated using the formula given by Arsham (2005).

$$N = 0.25 / SE^2$$

Where N = sample size, S = standard error, 5%

Accordingly, a total of 100 should be selected. However, to increase the precision we increased the sample size to 139. A simple random sampling method was employed to select the respondents from different parts of the town and peasant associations around the town. Respondents were included in the survey based on willingness and informed consent.

Inclusion and exclusion criteria

Household who live at least 6 months as the permanent resident in the study area were included in this study and household who live less than 6 months and respondents in the households who cannot communicate and under 15 years were excluded from this study.

Research ethics

The research proposal has been ethically evaluated and approved by the Mekelle University, college of veterinary medicine research and community service council. Each participant was informed about the purpose of the study and informed consent was obtained from each respondent. Participation in the study was voluntary and respondents were free to withdraw from the study at any time. Interviews were anonymous and data remained confidential throughout the study.

Data collection

Data was collected using structured questionnaire through face to face interview of the respondents. The questionnaire was designed to collect information about the respondents' knowledge of the disease, treatment, attitude and prevention practices as well as household information. The total of the respondents, 96 from Gondar town and 43 from its surrounding peasants, were selected based on willingness and informed consent.

Table 1. Socio-demographic characteristic of respondents.

Socio-demographic characteristic	Number and percentage of respondent		Peri-urban (%) n = 43
	Total (%) n = 139	Urban (%) n = 96	
Sex			
Male	108 (77.7)	65 (67.7)	36 (83.7)
Female	31 (22.3)	31 (32.3)	7 (16.3)
Age			
15-35	65 (6.8)	45 (46.9)	20 (46.5)
36-55	65 (46.8)	46 (47.9)	19 (44.2)
56-85	9 (6.5)	5 (5.2)	4 (9.3)
Education			
Cannot read and write	28 (20.1)	10 (10.4)	18 (41.9)
Informal(read and write only)	4 (2.9)	4 (4.2)	0 (0)
Primary school	54 (38.9)	33 (34.4)	21 (48.8)
Secondary school	26 (18.7)	22 (22.9)	4 (9.3)
Higher education	27 (19.4)	27 (28.1)	0 (0)
Occupation			
Health Profession	3 (2.1)	3 (3.1)	0 (0)
Veterinarian	10 (7.2)	10 (10.4)	0 (0)
Farmer	44 (31.7)	11 (11.5)	33 (76.7)
Merchant	10 (7.2)	10 (10.4)	0 (0)
Job less	14 (10.0)	14 (14.6)	0 (0)
House wife	34 (24.5)	27 (4.2)	7 (16.3)
Others	24 (17.3)	21 (45.8)	3 (7)

KAP of community toward rabies.

Data management and analysis

The data collected from questionnaire survey was entered into Microsoft Excel 2007 spread sheet. The data was cleaned and data generated were analyzed using the Statistical Package for Social science (SPSS) Version 16.0 to carryout descriptive analysis like percentage. Chi-square was used to evaluate the statistical significance of the differences in responses between the respondent from the urban and peri-urban areas. A p-value < 0.05 was considered significant.

RESULTS

Demographic characteristics of the respondent

Table 1 shows the profile of respondents from urban and peri-urban areas. Among 139 respondent, 108 (77.7%) of them were males and 31 (22.3%) were females. The majority of the respondents age groups included in the range of (15 to 35 and 36 to 55 year) and 39.4% of the respondents attended the primary school. The current study has demonstrated the presence of statistically significant difference on different types; knowledge, attitude and practice of respondent from urban and peri-

urban area (Tables 2 and 3). Among respondent 96.4% of them were familiar with the disease. Majority,69 (49.6%) of the respondents described starvation and thirst as causes of the disease in dogs and 65 (46.8%) respondents who know the disease mentioned bite and saliva as a means of transmission, while 30 (21.6%) of them perceived any type of contact (irrespective of the skin condition) with saliva of rabid individual as source of infection. Among the 139 respondents, 89.2% of them were aware that human and other different species of domestic animals can be affected by rabies. 89 (64%) of interviewers said that the sign of rabid animals was salivation and 50 (36%) have claimed sudden change in behavior. The majority of the respondents (83.4%) stated that only dog can transmit rabies to human and more than 92% of interviewers had never got training on rabies disease (Table 2).

As indicated in Table 3, 125 (89.9%) of respondents kill the animal after being rabid. The study showed that only 41.7% of respondents for those people exposed to rabies used post exposure vaccination. Conversely, 64 (46.1%) of interviewers sought traditional methods of treatment which employs the use of herbs. The respondents from

Table 2. Knowledge of respondent on rabies.

Parameter	Number and percentage of respondent			P-value
	Total (%) n = 139	Urban (%) n = 96	Peri-urban (%) n = 43	
Awareness about rabies				
Yes	134 (96.4)	95 (99.0)	39 (90.7)	0.127
No	5 (3.6)	1 (1.0)	4 (9.3)	
Cause of rabies				
Virus	25 (18)	21 (21.9)	4 (9.3)	0.076
Starvation and thirst	69 (49.6)	42 (43.8)	27 (62.8)	
I don't know	45 (32.4)	33 (34.4)	12 (27.9)	
Species affected by rabies				
Dog only	6 (4.3)	6 (6.1)	0 (0)	0.002
Dog and human	9 (6.4)	9 (9.2)	2 (4.7)	
Human and other domestic animal	124 (89.2)	83 (84.7)	41 (95.3)	
Means of transmission				
Bite only	35 (25.2)	27 (28.1)	8 (18.6)	0.032
Contact with Saliva only	30 (21.6)	22 (22.9)	8 (18.6)	
Bite and saliva contact with open wound	65 (46.8)	38 (39.6)	27 (62.8)	
Infected meat and others	9 (6.5)	9 (9.4)	0 (0)	
Animal species Transmit rabies to human				
Dog only	116 (83.4)	73 (76)	43 (100)	0.002
Dog and cat	20 (14.4)	20 (21.3)	0 (0)	
Other domestic animals	3 (2.1)	3 (3.1)	0 (0)	
Sign of the disease				
Salivation	89 (64)	55 (57.3)	34 (79.1)	0.013
Sudden change in behavior	50 (36)	41 (42.7)	9 (20.9)	
Have you ever get training				
Yes	11 (7.9)	11 (11.5)	0 (0)	0.021
No	128 (92.1)	85 (88.5)	43 (100)	

the peri-urban areas were more likely to seek treatment from traditional healers than those from urban areas. From the all respondent, 78 (56.1%) of them kill the animal which was exposed to rabies. Out of 139 respondents, only 36% of them vaccinate their dogs. According to 75 (54%) of interviewed household, vaccine was not regularly available in the clinic. children were mentioned as the most risky part of the society for rabies.

DISCUSSION

The result of current study has revealed the importance of rabies in the study area. The questionnaire survey on public awareness indicated that 96.4% of the respon-

dents had heard about rabies from different sources. This finding was in agreement with the report (99%) from Bahirdar, Ethiopia by Tadesse et al. (2014). However, it was higher when compared with reported proportion (68.7%) in a survey of knowledge, attitudes and practices about animal bite and rabies in general community in India (Ichhupujani et al., 2006). The current study has indicated many fallacies regarding the cause and means and source transmission which were observed. In the current study, 46.8% of respondents knew the correct mode of transmission which is consistent with the finding of Tadesse et al. (2014) who reported that 45% of the respondent answered correctly concerning transmission.

Among the respondent, 49.6% of them had misunderstanding on the cause of rabies. Respondents believe

Table 3. Attitude and Practice of the respondents.

Parameter	Number and percentage of respondent			P- value
	Total (%) n = 139	Urban (%) n = 96	Peri-urban (%) n = 43	
Action for rabid animal				
Tie	8 (5.8)	2 (2.1)	6 (14)	0.002
Killing	125 (89.9)	92 (95.8)	33 (76.7)	
Do nothing	6 (4.3)	2 (2.1)	4 (9.3)	
Action taken for bitten man				
Post exposure vaccine	58 (41.7)	50 (52.1)	8 (18.6)	0.001
Traditional treatment	64 (46.1)	36 (37.5)	28 (65.1)	
Both	17 (12.2)	10 (10.4)	7 (16.3)	
Action taken for bitten animal				
Killing	78 (56.1)	65 (67.7)	13 (30.2)	0.0001
No action	4 (2.9)	2 (2.1)	2 (4.7)	
Treatment	57 (41)	29 (30.2)	28 (65.1)	
Did you vaccinate your dog				
Yes	50 (36)	48 (50)	2 (4.7)	0.0001
No	89 (64)	48 (50)	41 (95.3)	
Availability of vaccine				
Yes always	26 (18.7)	18 (18.8)	0 (0)	0.0001
Sometimes	75 (54)	63 (65.6)	12 (27.9)	
No	38 (27.3)	15 (15.6)	31 (72.1)	
Dog management practice				
Let free	37 (26.6)	20 (20.8)	17 (39.5)	0.0001
Kept indoor	102 (73.4)	76 (79.2)	26 (60.5)	
More risky population				
Children	137 (98.6)	96 (100)	41 (95.3)	0.033
Old people	2 (1.4)	0	2 (4.7)	

that the disease in dogs is caused by starvation; thirst and the misunderstanding are significantly higher in peri-urban area. This result is lower when compared with the result (39.9%) obtained from study conducted in Bahirdar (Tadesse et al., 2014), Ethiopia. This could be due to the difference in level of community awareness in the study areas. This misunderstanding could probably be explained by the opinion of asymptomatic rabies carrier dogs in which stressors like starvation and thirst might induce development of clinical rabies in these carrier dogs. But the idea of asymptomatic rabies carrier dogs by itself is a controversial issue (Wilde et al., 2009), and the association of stressors to the development of clinical rabies might be an implausible claim. Dogs were mentioned as the most frequent cause of infection for most fatal human rabies cases by 83.4% of the

respondent. In addition, rabies in other domestic animals like cattle, sheep, goats and equines were also mentioned as risk for human. These findings were also reported by Eshetu et al. (2002). Domestic dogs have been a reservoir of rabies and a source of rabies infection to humans and other animals (John, 2005; Joo et al., 2011). In many parts of the world, especially in Africa and Asia, 85 to 95% of human rabies cases were being caused by dog bite (Tang et al., 2005; Fitzpatrick et al., 2012).

A traditional method of treatment was mentioned as the best option for treatment for victims of dog bites in most of the respondent both from urban and peri-urban areas. The respondents from the peri-urban areas were more likely to seek treatment from traditional healers than those from urban areas. This could be attributed to the

low level of education and awareness of the respondents. The practice of traditional treatment was also explained by Deressa et al. (2010), Wudu et al. (2013), Abraham et al. (2013). Moreover, this exclusively demonstrated the importance of extensive public education and improving the accesses to modern treatment to reduce the high dependency of victims on traditional treatment.

Out of 139 respondents, only 36% of them vaccinate their dogs. According to 75 (54%) of interviewed household, vaccine was not regularly available in. lower rate of community participation in dog vaccination was also mentioned by Abrham et al., 2013; Lai et al., 2005. According to the response from majority of the respondents (98.6%), group of populations more risky to the disease were children. This could be due to the fact that children are closely playing with dog at home and even in streets. In addition Assefa *et al.* (2010) has declared that elders are well aware of the danger of rabies and look for medical care than children.

The current finding showed that almost all respondent (95.3) in per-urban area did not vaccinate their dogs. The reason for low dog vaccination practice in per-urban area could be due to large dependency on the traditional treatment using herbs, limitation of availability and high cost of vaccine. This is in agreement with Wudu et al. (2013) who noted that dog vaccination practice was generally very low and totally nonexistent in rural district of the current study area. Relatively high percentages (50%) of the respondent from urban areas were found to have a habit of vaccination. But the vaccination program did not meet the expected level. The management system of most respondents in urban areas were kept indoor whereas almost half of respondents from peri-urban areas let their dogs free. This indicates the presence of high risk of rabies. On the other hand, the current study illustrated that training on rabies related aspect has not been given at community level. Therefore, public extensive education about rabies should be given to community to increase their awareness. Raising community awareness level has been mentioned as important tool to control rabies by many scholars (Eshetu et al., 2002; Wudu et al., 2013).

In conclusion, the result of the current study indicates the existence of high risk of the disease and low level of awareness of the community. Dogs were mentioned as primary source of infection to human as well as animals. The presence of low vaccination coverage and high dependency on traditional medicine, especially in the peri-urban area, were also well indicated. Such type of activities pose a health hazard and makes difficult the control of rabies in the area. Hence, raising awareness about dog vaccination and improving access and affordability of the vaccine should be considered in control of the disease, as dogs are the main reservoir of the disease.

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ABBREVIATIONS

CDC, Center for Disease Prevention and Control; **PEP**, post exposure prophylaxis; **RNA**, ribonucleic acid; **US**, United States; **WHO**, World Health Organization.

Conflict of interest

The author declared he has no conflict of interest.

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