

Baseline Surveillance on Rabies in Sylhet and Rangpur division in Bangladesh

Muhammed Hossain*

Department of Parasitology, Faculty of Veterinary and Animal Science, Sylhet Agricultural University, Sylhet-3100, Bangladesh

Corresponding Author: Muhammed Hossain, Department of Parasitology, Faculty of Veterinary and Animal Science, Sylhet Agricultural University, Sylhet-3100, Bangladesh. E-mail: bmhossain34sau@gmail.com

Citation: Muhammed Hossain (2016), Baseline Surveillance on Rabies in Sylhet and Rangpur division in Bangladesh. Int J Biotech & Bioeng. 2:1, 39-46. DOI:10.25141/2475-3432-2016-1.0054

Copyright: ©2016 Muhammed Hossain. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Received: August 27, 2016; **Accepted:** September 19, 2016; **Published:** September 29, 2016

Abstract:

The baseline surveillance on rabies in Sylhet was evaluated for the first time and in Rangpur division was checked for the second time in Bangladesh from June 2014 to January 2015. A semi-structured questionnaire was applied on total of 600 respondents including common people, school teachers, people's representatives, political leaders, doctors, nurses and medical technicians from selected households. Of the respondents on average 91% know about rabies and regionally 93% in Sylhet division and 89% in Rangpur division. This survey highlighted education is a key of awareness about rabies and the level of educated people found higher in Sylhet (96.33%) than Rangpur (88.33%). Still the practice of traditional healer use comparatively higher in Rangpur than Sylhet, and which is 8.8% and 5.13% respectively. Almost 100% of the respondents of different categories seek treatment of rabies from the hospital. Majority of them know about the fatality of rabies and believed that rabies could be prevented by vaccination program. Given these findings, there is a clear need for specific educational initiatives involving the local population and the public health entities, with the primary aim of contributing to the prevention of rabies

Keywords: Baseline, Surveillance, Rabies, Sylhet and Rangpur, Bangladesh

Introduction:

Rabies is an acute form of viral encephalomyelitis, which is almost invariably fatal, and affects mammals on all continents except Antarctica (Jackson, 2010). Transmission occurs through the inoculation of the virus, typically through bites, scratches or contact between skin lesions and the saliva of an infected animal (Kotait et al., 2009). Dog is the main reservoir of rabies virus (Kasempimolporn et al., 2008). All animal species may also be infected and serologic evidence of infection in bats has also been documented in Cambodia (Reynes et al. 2004). It is a common and lethal infectious disease for developing countries. More than 99% human death occurs due to rabies in the developing world (WHO 2004). It is responsible for more than 55 thousand cases of human rabies worldwide every year, mostly in Asia and Africa (Rupprecht et al., 2002). The majority of rabies cases reported to the Centers for Disease Control and Prevention (CDC) each year occur in wild animals like raccoons, skunks, bats, and foxes (CDC 2011). World Health Organization estimates that between 30,000 and 70,000

people die worldwide of rabies each year (Knobel et al. 2005). In the United States, approximately 40,000 people receive post exposure treatment annually while there has been an average of three fatal cases of human rabies per year since 1980 (Messenger et al. 2002). Most of these deaths occur in developing countries because of inadequate control of rabies in domesticated animals, and about 30,000 death results in India alone (Sehgal et al. 1997, Singh et al. 2001). It is estimated rabies kill every year 2000–2500 people in Bangladesh which is worldwide third in rank after India and China in human aspects (Hossain et al., 2011; Hossain et al., 2012; Hossain et al., 2013). Rabies is not limited to human, in a passive surveillance in domestic animal populations reported, 3425 rabies deaths (Cattle: 2845; Goats: 547; Sheep: 13) (2010–2012) in Bangladesh (Mondal and Yamage, 2014). The mortality rate in both animals and humans may be several folds higher than reported since rabies is not a notifiable disease in Bangladesh. Limited data available in Bangladesh about rabies although few

works have been done recently (Tenzin et al., 2015; Hossain et al., 2013), but previously baseline study on rabies conducted in Chittagong division (Gofur et al., 2011). In Bangladesh, domestic dogs act as the main source of rabies for both domestic animals and humans. As the application of post exposure rabies vaccine is globally known but still in Bangladesh people refuse to receive the vaccine properly and they used to on incomplete doses of rabies vaccine which consequences fatality. To get the knowledge and attitude of people in Sylhet and Rangpur division towards rabies this baseline survey has been documented which in terms will create opportunity for the precedents researchers and find a path to prevent this fatal viral disease.

Materials and Methods:

Study period and area:

A cross sectional study was carried out from June 2014 to January 2015 in selected areas of Sylhet and Rangpur divisions which are 350 kilometers and 264 kilometers away from the capital Dhaka, respectively by conducting face-to-face interviews using structured questionnaire.

Study population:

The study population included in this study common people, school teacher, people representative, political leader, doctor, nurse, and medical technician from selected households. The data were collected from Sylhet and Rangpur divisions. The age limit of the respondents was 16-85 years and about 600 respondents were studied. The households were chosen randomly. One person from each household was interviewed.

Data collection:

For collection of data a well-structured questionnaire developed and worked accordingly. During data collection the following general characteristics of a target population were included in the survey: age, sex, status in the family, level of education, prevention practice, treatment practice, control practice etc.

Statistical analysis:

The collected survey data were severer in excel sheet and statistical analysis have been performed by using STATA (College Station, Texas 77845 USA) to find out if there was any significant



Figure 1: During surveillance at field

relationship among the variables in respect to age, sex, occupation, housing, media facility, level of education. P value $P \leq 0.05$ was considered as level of significance.

Results and discussion:

Rabies is globally known viral disease infects devastatingly both human and warm blooded animals.

In this recent survey, the educational status of the respondents is given in (Table 01). From the surveyed 600 data it is clear that the literacy percentage of Sylhet division is comparatively higher than

Rangpur division in every discipline of the education. Education creates awareness among the people and they can take remedy in proper dose without negligence which ultimately cures the disease fatality (Wallace et al., 2006). Of the participants highest 19% completed higher secondary certificate and lowest 4% completed post-graduation in Sylhet whereas highest 20.67% completed higher secondary certificate and lowest 1.67% post-graduation. Illiteracy rate is higher in Rangpur which is 11.67%. Comparatively primary education of Rangpur division participants are higher than Sylhet division shown in (Table 02). Education appeared to be the principal factor determining levels of knowledge on rabies, as

Name of the areas			
Sylhet		Rangpur	
Male	Female	Male	Female
172 (57.33%)	128 (42.67%)	164 (54.67%)	136 (45.33%)

Table 1: Gender of the participants

Level of education	Division		Total % (Number)
	Sylhet % (Number)	Rangpur % (Number)	
Illiterate	03.67(11)	11.67(35)	07.67(46)
Primary	07.00(21)	13.67(41)	10.33(62)
Class eight	12.33(37)	17.33(52)	14.83(89)
SSC or Dakhil	16.00(48)	13.00(39)	14.50(87)
HSC or Alim	19.00(57)	20.67(62)	19.83(119)
Bachelor or Fazil	15.00(45)	10.67(32)	12.83(77)
Masters or Kamil	13.67(41)	08.33(25)	11.00(66)
Graduate (MBBS) Medical or Engineering	09.33(28)	03.00(9)	06.17(37)
Postgraduate Medical or Engineering	04.00(12)	01.67(5)	02.83(17)
Total	100.0(300)	100.0(300)	100.0(600)

¶SSC= Secondary school certificate; HSC= Higher secondary certificate; MBBS= Bachelor of medicine bachelor of surgery.

Table 2: The level of education among the respondents

shown in the previous studies in Asia and Africa (Tenzin et al., 2012; Ali et al., 2013; Gaudu et al., 2014; Sambo et al., 2014).

¶SSC= Secondary school certificate; HSC= Higher secondary certificate; MBBS= Bachelor of medicine bachelor of surgery.

Rabies is transmitted through introduction of saliva by rabid dog bite. Different personnel have different views regarding this source of infection. People get information from different sources about rabies and the notion of the participants is summarized in (Table 03). When the education and awareness about rabies disseminate in the community people can get more information from their fellow. Due to the advancement of technology people gather information

from different sources. Education has more access to information and that will help to understand the zoonosis of rabies (Gaudu et al., 2014). In every category people get information from TV, radio and health workers. In Sri Lanka 96% of the people would seek treatment from a doctor or a hospital after being bitten by dog; this high level of awareness might be due to the availability of information from multiple sources including government campaigns and mass media in addition to the free medical services available in government hospitals (Matibag et al. 2007).

Post exposure vaccination is mandatory after dog bite. It is still in practice use of traditional healer. In Rangpur, traditional healer use in common people comparatively higher than Sylhet and which is

Category	Source of Information	Division		Total % (Number)
		Sylhet % (Number)	Rangpur % (Number)	
Common People	Radio, TV	07.69(9)	08.80(11)	08.26(20)
	Health worker	09.40(11)	13.60(17)	11.57(28)
	Family member	27.35(32)	26.40(33)	26.86(65)
	Other sources	45.30(53)	44.80(56)	45.04(109)
	Radio, TV and Health worker	10.26(12)	06.40(8)	08.26(20)
Total		100.0(117)	100.0(125)	100.0(242)
People representative	Radio, TV	17.39(4)	16.67(3)	17.07(7)
	Health worker	26.09(6)	27.78(5)	26.83(11)
	Family member	34.78(8)	44.44(8)	39.02(16)
	Other sources	21.74(5)	11.11(2)	17.07(7)
Total		100.0(230)	100.0(18)	100.0(41)
School teacher	Radio, TV	10.20(5)	16.22(6)	12.79(11)
	Health worker	34.69(17)	37.84(14)	36.05(31)
	Family member	30.61(15)	18.92(7)	25.58(22)
	Other sources	24.49(12)	27.03(10)	25.58(22)
Total		100.0(49)	100.0(37)	100.0(86)
political leader	Radio, TV	22.22(4)	14.29(3)	17.95(7)
	Health worker	44.44(8)	33.33(7)	38.46(15)
	Family member	11.11(2)	19.05(4)	15.38(6)
	Other sources	22.22(4)	33.33(7)	30.56(11)
Total		100.0(18)	100.0(21)	100.0(39)
Doctor	Radio, TV	10.71(3)	15.15(5)	13.11(8)
	Health worker	39.29(11)	48.48(16)	60.66(37)
	Family member	32.14(9)	15.15(5)	22.95(14)
	Other sources	17.86(5)	21.21(7)	19.67(12)
Total		100.0(28)	100.0(33)	100.0(61)
Nurse + MT	Radio, TV	13.51(5)	16.28(7)	15.00(12)
	Health worker	32.43(12)	25.58(11)	28.75(23)
	Family member	21.62(8)	18.60(8)	0.20(16)
	Other sources	32.43(12)	39.53(17)	36.25(29)
Total		100.0(37)	100.0(43)	100.0(80)

¶ TV= Television; MT= Medical technologist

Table 3: Percentage of the respondents of different category regarding the knowledge on source of rabies.

Category	Treatment taken from	Division		Total % (Number)
		Sylhet % (Number)	Rangpur % (Number)	
Common people	Traditional healer	05.13(6)	08.80(11)	07.02(17)
	Hospital Doctor	94.87(111)	91.20(114)	92.98(225)
People's representative	Hospital Doctor	100.0(23)	100.0(18)	100.0(41)
School teacher	Hospital Doctor	100.0(49)	100.0(37)	100.0(86)
Political leader	Hospital Doctor	100.0(18)	100.0(21)	100.0(39)
Doctor	Hospital Doctor	100.0(28)	100.0(33)	100.0(61)
Nurse + MT	Hospital Doctor	100.0(37)	100.0(43)	100.0(80)

¶ MT= Medical technologist

Table 4: Percentage of the respondents of different category regarding the type and place for treatment of rabies taken from doctor or traditional healer

8.8% and 5.13% respectively (Table 04). Every educated person conscious about the use of vaccine and they used to contact to doctor for post bite vaccine.

Aftermath of rabid dog bite is fatal if post exposure vaccine does not practice. About the fatality knowledge of common people is low. People representative, Political leader, doctor, nurse and medical technologist are quite sure about the fatality (i.e. death) of rabies (Table 05). In the rural areas near New Delhi, 84.0% of respondents were aware that dog bites might cause death (Agarwal and Reddaiah 2003). The long historical presence of rabies and its unfinished impact on modern life yet might be the reason for their conception about the rabies.

In our recent survey the visible findings is use of herbal drug in lieu of vaccine. Apart of herbal they also use some other anonymous

traditional healer for rabies. In Sylhet and Rangpur percentage of herbal drug use 5.13% and 7.20% respectively (Table 06). Use of vaccine after dog bite is common practice both in Sylhet and Rangpur among conscious personnel.

As dog is the main reservoir of rabies virus so control of stray dog is inevitable. About these issues different institution like Government organization, non-government organization, and even community people can participate for controlling stray dogs. The responsibility of local government is much higher than any other organization on control of stray dog, 87.33% participants of Sylhet and 89.33% participants of Rangpur opted (Table 07).

The present study indicated that there is still inadequate and insignificant knowledge of the respondents on rabies which is consistent of another finding (Moran et al., 2015). Participation of

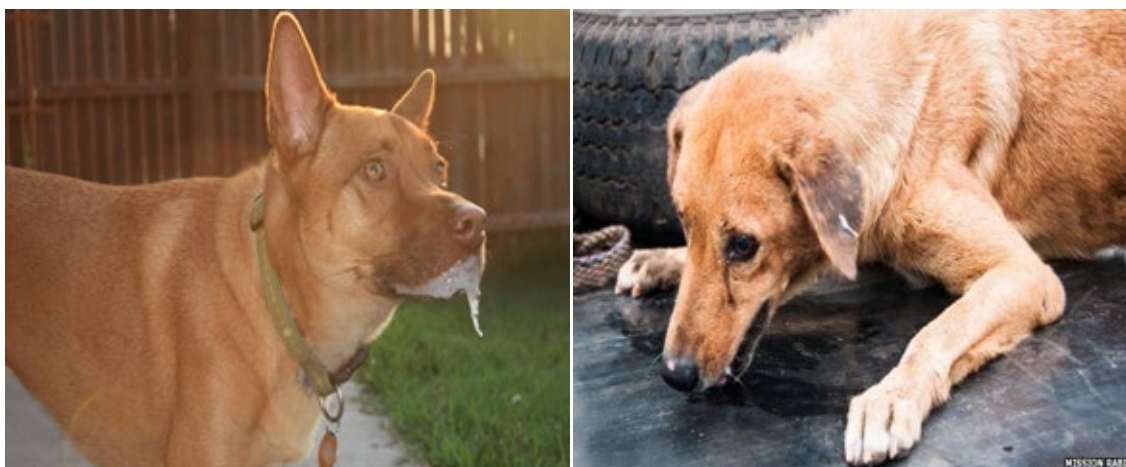


Figure 2: Rabies infected rabid dog at the locality

Category	Fate of Rabies	Division		Total % (Number)
		Sylhet % (Number)	Rangpur % (Number)	
Common People	Death	94.02(110)	95.20(119)	94.63(229)
	Survive with disability	01.71(2)	01.60(2)	01.65(4)
	survive as mad	04.27(5)	03.20(4)	03.72(9)
People representative	Death	100.0(23)	100.0(18)	100.0(41)
School teacher	Death	93.88(46)	97.28(36)	95.35(82)
	Survive with disability	06.12(3)	02.70(1)	04.65(4)
Political leader	Death	100.0(18)	100.0(21)	100.0(39)
Doctor	Death	100.0(28)	100.0(33)	100.0(61)
Nurse + MT	Death	100.0(37)	100.0(43)	100.0(80)

¶ MT= Medical technologist

Table 05: Percentage of the respondents of different category regarding the concept on fate of rabies

Category	Prevention process of rabies	Division	
		Sylhet % (Number)	Rangpur % (Number)
Common people	By herbal drugs	05.13(6)	07.20(9)
	By vaccine	88.89(104)	89.60(112)
	By other drugs	05.98(7)	03.20(4)
People representative	By vaccine	100.0(23)	100.0(18)
School Teacher	By vaccine	100.0(49)	100.0(37)
Political leader	By vaccine	100.0(18)	100.0(21)
Doctor	By vaccine	100.0(28)	100.0(33)
Nurse + MT	By vaccine	100.0(37)	100.0(43)

¶ MT= Medical technologist

Table 6: Percentage of the respondents regarding the prevention of rabies

Institution responsible	Division		Total % (Number)
	Sylhet % (Number)	Rangpur % (Number)	
People in the Community	05.67(17)	04.33(13)	05.0(30)
NGOs	07.0(21)	06.33(19)	06.67(40)
Local Government agency	87.33(262)	89.33(268)	88.33(530)
Total	100.0(300)	100.0(300)	100.0(600)

¶ NGOs= Non-Government Organization

Table 7: Percentage of the respondents comments on agency/institution responsible for controlling stray dogs

non-government organization is minute on stray dog control and it is about 7% and 6.33% respectively in Sylhet and Rangpur division. Therefore rabies control program must be continued with reliable data because lack of reliable data on dog population and their ecology and limited surveillance of rabies infection in dogs and humans also hamper control and prevention (Denduangboripant et al., 2005; Kongkaew et al., 2004). In the present study, almost all the participants believed that rabies could be prevented by vaccination programme. This kind of perception was high among educated and high income groups of people. The availability of the vaccine is also a factor for this motive development.

Conclusion:

This study provides baseline perception on rabies. The objectives of this study may be achieved through the development of educational initiatives, primarily through the relevant public health authorities, and should be directed at both men and women of all ages and education levels. These recommendations are directly relevant to the reality of the Sylhet and Rangpur division, although they may provide a practical model for other regions of the world where there is a high risk of lethal outbreaks of human rabies. There is also a need for inter-agency collaborations and the one health approach engaging human health and veterinary professionals to control rabies in Bangladesh.

References:

1. Agarwal N. and Reddaiah VP. (2003). [Knowledge, attitude and practice following dog bite: a community-based epidemiological study. Perspectives and Issues, 26:154-161](#)
2. Ali A. Ahmed EY. Sifer D. (2013). [A study on knowledge, Attitude and Practice of rabies among residents in Addis Ababa, Ethiopia. Ethiopian Veterinary Journal. 17:19-35.](#)
3. CDC. 2011. Centers for Disease Control and Prevention. <http://www.cdc.gov/rabies>
3. Denduangboripant J. Wacharapluesadee S. Lumlertdacha B. Ruankaew N. Hemachudha T. (2005). [Transmission dynamics of rabies virus in Thailand: implications for disease control . BMC Infect Dis 5: 52 .](#)
4. Gofur MA, Khanum H, Podder MP and Elahi R (2011). [Baseline investigation on rabies in Rangpur and Chittagong divisions, Bangladesh. Bangladesh J. Zool. 39\(2\): 195-204](#)
5. Guadu T. Shite A. Chanie M. Bogale B. Fentahum T. (2014). [Assessment of knowledge, Attitude and Practices about rabies and Associated Factors: In the Case of Bahir Dar Town. Global Veterinaria. 13:348-354.](#)
6. Hossain M. Ahmed K. Bulbul T. Hossain S. Rahman A. (2012). [Human rabies in rural Bangladesh. Epidemiol Infect. 140: 1964-1971.](#)
7. Hossain M. Ahmed K. Marma ASP. Hossain S. Ali MA. (2013).

- [A survey of the dog population in rural Bangladesh. Pre Vet Med, 111:134-138](#)
8. Hossain M. Bulbul T. Ahmed K. Ahmed Z. Salimuzzaman M. (2011). [Five-year \(January 2004- December 2008\) surveillance on animal bite and rabies vaccine utilization in the Infectious Disease Hospital, Dhaka, Bangladesh. Vaccine 29: 1036-1040.](#)
9. Jackson AC. (2010). [Atualização sobre a patogênese da raiva. Revista Pan-amazônica de Saúde. 1:167-172.](#)
10. Kasempimolporn S. Sichanasai B. Saengseesom W. Puempumpanich S. Sitprija V. (2008). [Stray dogs in Bangkok, Thailand: rabies virus infection and rabies antibody prevalence. Dev Biol \(Basel\) 131: 137-143.](#)
11. Knobel DL. Cleaveland S. and Colman PG. (2005). [Re-evaluating the burden of rabies in Africa and Asia. Bull. Wld. Hlth. Org. 83: 360](#)
12. Kongkaew W. Coleman P. Pfeiffer DU. Antarasena C. Thiptara A. (2004). [Vaccination coverage and epidemiological parameters of the owned-dog population in Thungsong District, Thailand . Prev Vet Med 65: 105-115.](#)
13. Kotait I. Carrieri ML. Takaoka NY. (2009). [Raiva-Aspectos gerais e clínica. São Paulo: Instituto Pasteur.](#)
14. Matibag GC. Kamigaki T. Obayashi Y. Kanda K. and Tamashiro H. (2007). [Knowledge, Attitudes, and Practices Survey of Rabies in a Community in Sri Lanka. Environ. Hlth. Prevent. Med 12: 84-89.](#)
15. Messenger SL. Smith JS. and Rupprecht CE. (2002). [Emerging epidemiology of bat-associated cryptic cases of rabies in humans in United States. Clin. Infect Dis. 35: 738.](#)
16. Mondal SP. And Yamage M. (2014) [A Retrospective Study on the Epidemiology of Anthrax, Foot and Mouth Disease, Haemorrhagic Septicaemia, Peste des Petits Ruminants and Rabies in Bangladesh, 2010-2012. PLoS ONE 9\(8\): e104435](#)
17. Moran D. Juliao P. Alvarez D. Lindblade KA. Ellison JA. Gilbert AT. Petersen B. Rupprecht C. Recuenco S. (2015). [Knowledge, attitudes and practices regarding rabies and exposure to bats in two rural communities in Guatemala. BMC Research Notes. 8:955.](#)
18. Reynes JM. Molia S. Audry L. Hout S. Ngin S. and Walston J. (2004). [Serologic evidence of Lyssavirus infection in bats, Cambodia. Emerg. Infect. Dis. 10\(12\): 2231-2234.](#)
19. Rupprecht CE. Hanlon CA. Hemachudha T. (2002). [Rabies re-examined. The Lancet Infectious Diseases. 2:327-343.](#)
20. Sambo M. Lembo T. Cleaveland S. Ferguson HM. Sikana L. Simon C. (2014). [Knowledge, Attitudes and Practices \(KAP\) about Rabies Prevention and Control: A community Survey in Tanzania. Plos Neglected Tropical Diseases. 8 \(12\):e3310.](#)

21. Sehgal S. Bhattachanya D. and Bhardwaj M. (1997). Longitudinal studies of the safety and efficacy of human antirabies vaccine in an endemic country- India [abstract no 6.06]. In: Proceedings of the International Rabies Meeting (Paris). Paris: Institut Pasteur.
22. Singh J. Jain DC. Bhatia R. Ichhpujani RL. Harit AK. and Panda RC. (2001). [Epidemiological characteristics of rabies in Delhi and surrounding areas, 1998](#). *Indian Pediatrics* 38: 1354-1360.
23. Tenzin DNK. Changlo RBD. Tenzin S. Tsheten K. Ugyen P. Singye K. Warda MP. (2012). [Community based study on knowledge, attitudes and perception of rabies in Gelephu, south central Bhutan](#). *International Health*. 4:210–219.
24. Tenzin T. Ahmed R. Debnath NC. Ahmed G. Yamage M. (2015). [Free-Roaming Dog Population Estimation and Status of the Dog Population Management and Rabies Control Program in Dhaka City, Bangladesh](#). *PLoS Negl Trop Dis* 9(5): e0003784.
25. Wallace C. Corben P. Turahui J. Gilmour R. (2008). [The role of television advertising in increasing pneumococcal vaccination coverage among the elderly, North Coast, New South Wales, 2006](#). *Aust N Z J Public Health*. 32: 467-70.
26. WHO, (2004). [Expert Consultation on Report rabies: first report. 2004](#). Geneva, World Health Organization.