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Retrospective Study of Rabies Cases Reported at St. Luke Hospital and Community Awareness in Woliso, Oromia, Ethiopia

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ABSTRACT

A retrospective study was conducted in Woliso, Oromia regional state with the objective of determining the magnitude of rabies exposure among human cases reported at St. Luke Hospital for the last five years. Among a total of 2,431 reported human rabies cases from 2010 to 2014, about 55.3% were found to be children less than 15 years of age, 38.2% were adult between 16-45 years and 6.5% were older people above 46 years old. About 65.6% of human cases receiving post-exposure vaccine were from Woliso and its environs whereas 14.9% and 19.5% cases were from Wolkite and Jimma, respectively. Based on the questionnaire survey analysis, majority of the respondents (84.5%) were found to have awareness about rabies and the statistical analysis showed that age and educational status were moderately and highly significant with the level of awareness about the disease ($x^2 = 8.251$, $p = 0.083$ and $x^2 = 18.804$, $p = 0.00$), respectively whereas no statistical significant difference between sex groups ($x^2 = 1.010$, $p = 0.315$). The present finding revealed that rabies is endemic, and dogs are the primary host in maintaining and disseminating the disease in the study area. Therefore, there should be a strong inter-sectorial coordination between health and veterinary professionals to have successful rabies control and prevention strategy.

Keywords: Rabies Cases; Retrospective Study; Community Awareness; Woliso

Introduction

Rabies is one of the oldest known and the main zoonotic diseases caused by a virus and death nearly always follows once an animal or human has been clinically ill with the disease [1]. It is a viral disease that affects the central nervous system (CNS) of mammals and has an extremely high case fatality rate. Once the clinical signs develop, there are very few survivors, and it is one of the most disastrous diseases for both animals and human beings [2]. Rabies Virus belongs to the genus Lyssavirus, family Rhabdoviridae and causes the disease rabies. Rabies virus is enzootic throughout Africa with the domestic dog (Canis familiaris) being the principal vector [3]. The disease affects all mammals and is nearly always fatal once clinical signs appear [4]. The most common mode of rabies transmission is through the bite and virus-containing saliva of infected animals, usually domestic dogs [5].

Rabies is a disease for which vaccines are currently available for both animals and humans [6]. Almost all human deaths from rabies could be prevented through appropriate wound management and prompt delivery of PEP following exposure [7]. Ensuring a reliable and affordable supply of PEP is therefore an essential step for eliminating human deaths from rabies but is not on its own a sustainable or economically viable solution [8]. The World Health Organization (WHO) recommends a PEP regimen which requires 5 successive visits to hospital over the course of a month [9]. However, in many areas of sub-Saharan Africa, access to PEP is a challenge; shortages are fre-

quent, and bite-victims must travel long distances to obtain expensive PEP [10]. There is no known cure for symptomatic rabies, but it can be prevented by vaccination, both in humans and other animals. Virtually every infection with rabies was a death sentence, until Louis Pasteur and Emile Roux developed the first rabies vaccination in 1885. The sources of rabies to humans are mostly rabid animals. Therefore, control of infection is targeted to both humans and animals [11]. Vaccines can protect pets, as well as people exposed to these animals, but the maintenance of rabies viruses in wildlife complicates control. In humans, rabies can be prevented by administering anti-rabies antibodies and a series of vaccinations, provided exposure is recognized before the symptoms appear [12].

Most human rabies deaths occur because of epidemics in animal populations, as the disease is maintained in animals, particularly domestic dogs [13]. For infection of rabies to be eliminated, control measures must therefore target the reservoir [14]. Mass dog vaccination is the most cost-effective way to control rabies [15]. Culling dogs is sometimes promoted by local and national authorities as a method to control rabies, however dog population reduction alone has been shown to be ineffective and oftentimes counterproductive [9]. Although under control in the developed world [16], control of rabies in Africa and Asia has been severely neglected, partly due to poor surveillance and unreliable statistics on rabies incidence [17]. The absence of accurate data on the burden of rabies has meant that rabies control has not been prioritized [16]. Therefore, the objectives of the study are to determine the magnitude of rabies exposure among human victims reported at St. Luke Hospital, Woliso and to assess knowledge, attitude, and practice of the community awareness about the disease.

Materials and Methods

Study Area

The study was conducted from November 2016 to September 2017 in and around Woliso, about 114Km southwest of Addis Ababa, Oromia regional state, of Ethiopia particularly in the southwest Shoa zone which is located at a latitude and longitude of 8°32′N and 37°58′E, respectively. The area receives mean annual rainfall of 1200 mm in bimodal distribution, with minimum and maximum temperature of 18°C and 27°C, respectively. The long rainy season lasts from June to August and short rainy season lasts from January to March, which is characterized by temperate type of climate and found on about 1900m.a.s.l.

Study Population

The study population was records of human cases suspected and vaccinated with post-exposure rabies vaccine at st. Luke hospital, and the community in and around Woliso were used for interview to assess their knowledge, attitude, and practice about rabies disease.

Study Design and Data Collection

A retrospective data recorded for the last five years (2010-2014) at st. Luke Hospital about the occurrence of rabies in humans in the study area was collected. A questionnaire survey was conducted to collect information concerning the various risk factors for the occurrence of the rabies disease in the study area. A standard structured questionnaire was developed to assess the respondents' knowledge, attitude, and practice to the various risk factors for the occurrences of the disease. The number of people that received post exposure anti rabies treatments during the same period was obtained from the record at the hospital.

Sample Size Determination

The questionnaire survey sample size was calculated by using formula [18]:

$$n=0.5/SE^2$$

Where: n=sample size, SE (Standard error) =5%. The sample size required for questionnaire survey as per the above formula was 200. However, 161 respondents were interviewed.

Data Analysis

The data collected was entered in Microsoft Excel 2007 spread sheet and transferred to SPSS Version 16 for statistical analysis. Both descriptive and analytical statistical techniques were used for data analysis. Different age group, sex and educational level were analyzed by using chi-square (X2) and descriptive statistical test.

Results

Rabies Cases at St. Luke Hospital

In the current study, a total of 2,431 peoples were received anti rabies post exposure treatment at St. Luke Hospital in Woliso, who were bitten/infected by rabies suspected animals within the period of 2010-2014 (Table 1). Among the reported human rabies cases, 55.3% were children less than 15 years of age, 38.2% were adults between 15-45 years age, and 6.5% were older people above 46-year-old. From the total suspected human cases, 65.5% were from Woliso and its surrounding, whereas 14.9% were from Gurage zone (Wolkite) and 19.5% were from Jimma zone, and about 59.4% of the cases were male and 40.6% were female. The statistical analysis showed significant difference between areas where the victims came from (x^2 = 62.219, p = 0.00) (Table 2).

Table 1: Number of human cases based on age from 2010-2014 reported at st. Luke Hospital, Woliso.

Factors		Year					
		2010	2011	2012	2013	2014	Total
Age	<15 years	66 (52.4%)	280 (61.0%)	398 (55.2%)	350 (55.0%)	251 (51.3%)	1345 (55.3%)
	15-45 years	45 (35.7%)	152 (33.1%)	275 (38.1%)	252 (39.6%)	204 (41.7%)	928 (38.2%)
	>45 years	15 (11.9%)	27 (5.9%)	48 (6.7%)	34 (5.4%)	34 (7.0%)	158 (6.5%)

Note: (X^2 = 14.994, p = 0.242).

Table 2: Number of human cases based on sex and area from 2010-2014 reported at st. Luke Hospital, Woliso.

Factors		Year					
		2010	2011	2012	2013	2014	Total
Sex	Female	53 (5.4%)	180 (18.2%)	273 (27.7%)	267 (27.1%)	214 (21.7%)	987 (40.6%)
	Male	63 (4.4%)	247 (17.1%)	448 (31.0%)	369 (25.6%)	317 (22.0%)	1444 (59.6%)
Area	Woliso	78 (4.9%)	309 (19.4%)	432 (27.1%)	396 (24.8%)	380 (23.8%)	1595(65.6%)
	Wolkite	33 (9.1%)	43 (11.9%)	116 (32.0%)	101 (27.9%)	69 (19.1%)	362(14.9%)
	Jimma	5 (1.1%)	75 (15.8%)	173 (36.5%)	139 (29.3%)	82 (17.3%)	474(19.5%)
Total		116 (4.8%)	427 (17.6%)	721 (29.7%)	636 (26.2%)	531 (21.8%)	2431(100%)

Note: Sex (p = 0.350, x^2 =4.434), Area (p = 0.00, x^2 = 62.219)

Questionnaire Results

A total of 161 respondents were interviewed regarding their knowledge, attitude, and practice towards rabies disease. Among the respondents, 84.5% (136) were found to have general awareness about rabies whereas about 15.5% (25) of them did not have knowledge about the disease (Table 2). Among the respondents (53, 32.9%) with age group of 20-29 years, 94.3% (50) found to have relatively high awareness about the disease as compared to individuals with age of 30-39 years (86.1%), 40-49 years (73.3%) and 50 and above years (83.3%). There was slightly significant association among the different age groups (x^2 = 8.251, p = 0.083) and awareness about rabies (Table 3). Among the sex groups, male respondents had relatively higher (87.0%) awareness about rabies than females (81.2%); however, there was no significant differences among sex groups and awareness about the disease (x^2 = 1.010, p = 3.15). Most of the respondents (95.5%) with secondary and above educational level had high knowledge and attitude about the disease as compared to those with illiterate (66.7%) and primary (75%). The statistical analysis on different levels of education showed significant association with awareness of the disease (x^2 = 18.804 p = 0.00) (Table 3).

Table 3: Knowledge of respondents about rabies disease.

Factors		Knowledge of Respondents			Chi-square (95 % CI)
		No	Yes	Total	
Sex	Male	12(13%)	80(87%)	92	X^2 = 1.010
	Female	13(18.8%)	56(81.2%)	69	P = 0.315
Age	10-19	7(23.3%)	23(76.7%)	30	X^2 = 8.251 P =0.083
	20-29	3(5.7%)	50(94.3%)	53	
	30-39	5(13.9%)	31(86.1%)	36	
	40-49	8(26.7%)	22(73.3%)	30	
	>50	2(16.7%)	10(83.3%)	12	
Level of Education	Illiterate	11(33.3%)	22(66.7%)	33	X^2= 18.804 P =0.00
	Primary	10(25%)	30(75%)	40	
	Secondary and above	4(4.5%)	84(95.5%)	88	
Total		25(15.5%)	136(84.5%)	161(100%)	

Discussion

In the present study, the numbers of dog-bite human cases receiving post exposure anti-rabies vaccine at st. Luke Hospital during the period of five years (2010-2014) were found relatively increasing due course time since it was 116 cases in 2010 and 531 cases in 2014. Among the reported human rabies cases, 55.3% were children less than 15 years age, 38.2% were adult between 16-45 years age, and 6.5% were older people above 46-year-old. This agrees with [19] who reported that most rabies cases were from 0-14 age category while the minimum cases were recorded in 50 years and above age category. This finding might be because most of the victims are infants and school children who are closely playing with pets at home and even in streets under Ethiopian situation. In the contrary, some elders are aware of the danger of rabies and look for medical care [19]. The data also shows that male people are more affected with 59.4% than female with 40.6%. This agrees with [20], who reported 169 (53.8%) of males and 146 (46.2%) cases of females. This might be indicated that male is more exposed than female because males are works outside of home especially in the rural parts of the country. So, the chance to be exposed to stray dog is higher in male.

This study also revealed that there was a higher occurrence of rabies in and around Woliso with 65.6% than in both Wolkite and Jimma with 14.9% and 19.5%, respectively. This agrees with [19], who reported a total of 11,017 (64%) humans from Addis Ababa and 6,187 (35.96%) humans from areas outside of Addis Ababa were taken post exposure anti-rabies prophylaxis. However, it disagrees with [21], who reported majority of exposure cases were recorded in the Dabat rural district rather than Gondar town. There was a remarkable difference between areas within and outside study area to receive post exposure prophylaxis This might be due to the reason that some people from areas in accessible to medical treatment prefer to seek traditional healers instead of traveling long distance to hospital as there is no rabies diagnosis center or service nearby. Among a total of 161 respondents, 84.5% (136) were found to have general awareness about rabies whereas about 15.5% (25) of them did not have knowledge about the disease; and 94.3% (50) age groups between 20-29 years were found to have relatively high awareness about the disease as compared to individuals with age of 30-39 years (86.1%), 40-49 years (73.3%) and 50 and above years (83.3%). Age and sex of the respondents had moderate ($p = 0.083$, $x^2 = 8.251$) and no significant ($p = 0.315$, $x^2 = 1.010$) influence on the awareness parameters considered for this study, respectively. This agrees with the report of [22], who reported there were no significant associations in age and gender distribution.

Most of the respondents (95.5%) with secondary and above educational level had high knowledge and attitude about the disease as compared to those with illiterate (66.7%) and primary (75%). The statistical analysis on different levels of education showed significant association with awareness of the disease ($x^2 = 18.804$, $p = 0.00$). A similar finding has been reported by [23] who found that the educational status of the respondents had significant influence on their awareness regarding rabies. The difference in level of awareness could be because educated people have better access to information and easily understand about the disease [23].

Conclusion and Recommendations

Rabies is one of the most disastrous and major public-health diseases for both animal and human being in most parts of the developing world including Ethiopia, where dogs play a great role as a reservoir and transmitter of the disease to humans. In the present study, there was an increasing high number of dog bite human cases received post exposure anti-rabies vaccine at St. Luke Hospital during the last five years from 2010-2014. This study has also revealed that the level of community awareness about rabies was low especially on the mode of rabies transmission, its clinical signs, and prevention methods. Based on questionnaire interviews, the potential risk factors like age and educational status were found to have moderate and high significant association with the level of awareness about the disease, respectively whereas no statistically significant difference between sex groups.

Based up on the above remarks, the following recommendations need to be considered in controlling the disease:

a) To have a successful rabies control and prevention strategy, there should be a strong inter-sectorial coordination between health and veterinary professionals.

b) Awareness creation should be conducted in the community particularly for primary and secondary school students about rabies.

c) Government bodies need to encourage the establishment of rabies diagnostic laboratories in each region.

References

1. Fields B, Knipe D (1990) In Virology (2nd Edn.)., Raven Press, New York, USA, pp. 883-930.
2. Wond wossen A (1999) Message from federal veterinary service team. Ethiopia Veterinary Epidemiology Newsletter, p. 1.
3. Hayman D, Johnson N, Horton D, Hedge J, Wakeley P, et al. (2011) Evolutionary History of Rabies in Ghana. Plos Neglected Tropical Disease 5: E1001.
4. Hemachudha T, Laothamatas J, Rupprecht C (2002) Human rabies: A disease of complex neuropathogenetic mechanisms and diagnostic challenges. Lancet Neurology 1: 101-109.
5. Chopra J, Lal V (1999) Neurological Manifestations of Rabies. The Neurologist 5: 37-43.
6. Ertl H (2009) Novel Vaccines to Human Rabies. Plos Neglected Tropical Diseases 3: e515.
7. Rupprecht C (2006) Additional thoughts on human rabies vaccination. Journal of the American Veterinary Medical Association 229: 206-207.

8. Hampson K, Cleaveland S, Briggs D (2011) Evaluation of Cost-Effective Strategies for Rabies Post Exposure Vaccination in Low-Income Countries. Plos Neglected Tropical Disease 5: e982.

9. (2005) WHO expert consultation on rabies first report. WHO Technical Report Series 931. Geneva, Switzerland, pp. 1-121.

10. Cleaveland S, Hampson K, Kaare M (2007) Living with rabies in Africa. Veterinary Record 161: 293-294.

11. Crawford K, Abelseth M, Reeman I, Miller B, Shuler I, et al. (1982) Recommendation for immunization procedures and principals of rabies control.

12. Melese M (1991) Comparative study of rabies diagnostic methods, DVM thesis. Faculty of Veterinary Medicine, Addis Ababa University, Debrezeit, Ethiopia.

13. Krebs J, Wilson M, Childs J (1995) Rabies-Epidemiology, Prevention and Future Research. Journal of Mammalogy 76: 681-694.

14. Lembo T, Hampson K, Haydon D, Craft M, Dobson A, et al. (2008) Exploring reservoir dynamics: A case study of rabies in the Serengeti ecosystem. Journal of Applied Ecology 10: 1365- 2664.

15. Kaare M, Lembo T, Hampson K, Ernest E, Estes A, et al. (2009) Rabies control in rural Africa: Evaluating strategies for effective domestic dog vaccination. Vaccine 27(1): 152-160.

16. Lembo T, Attlan M, Bourhy H, Cleaveland S, Costa P, et al. (2011) Renewed global partnerships and redesigned roadmaps for rabies prevention and control. Veterinary medicine international 9: 23-149.

17. Knobel D, Cleaveland S, Fèvre E, Meltzer M (2005) Re-evaluating the burden of rabies in Africa and Asia Bull. WHO 83 (5): 360-368.

18. Arsham H, Ford D, Morse J, Pitta D (2007) The rate decision: Adjustable vs fixed rate mortagages. Journal of business and economic research 5(11): 31-42.

19. Asefa D, Abraham A, Mekoro B, Bethelehem N, Eshetu Y, et al. (2010) The status of rabies in Ethiopia: A retrospective record review. Ethiopia Journal of Health Development 24(2): 127-132.

20. Yimer E, Neway B, Girma T, Mekonnen Y, Yoseph B, et al. (2002) Situation of rabies in Ethiopia: A retrospective study 1990-2000. Ethiopia Journal of Health Development 16(1): 105-112.

21. Wudu T, Wassie M, Gizat A, Sefinew A (2013) Incidence of Rabies in Humans and Domestic Animals and People's Awareness in North Gondar Zone, Ethiopia. Plos Neglected Tropical Disease 7(5): 2216.

22. Matibag G, Ohbayashi K, Kanda H, Yamashina W, Gunawardena A, et al. (2009) A Pilot Study on the Usefulness of Information and Education Campaign Materials in Enhancing the Knowledge, Attitude and Practice on Rabies in Rural Sri Lanka. Journal of Infection in Developing Countries 3(1): 55-64.

23. Fetene J, Getachew G, Abebe M, Meselu A (2014) Profile of Rabies in Asella Hospital and Community Based Epidemiological Study on Rabies in Arsi Zone, Arsi, Oromia, Ethiopia. African Journal of Basic and Applied Science 6(5): 141-147.

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