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Original Research

Status of Rabies Suspected Cases in Human in Nekemte Health Center, East Wollega Zone, Western Ethiopia

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Abstract

Rabies is encephalitis, almost inevitably fatal zoonotic disease. In Ethiopia it is highly endemic. Approximately 10, 000 people were estimated to die of rabies annually as the domestic dog plays a principal role as a reservoir and transmitter of the disease to humans which make it to be one of the worst affected countries in the world. A retrospective study was conducted from November, 2015 to April, 2016 in Nekemte Town health center with the objectives of reviewing of recorded data on the status of rabies. The result indicated that a total of 727 peoples that were bitten by rabies suspected animals within the period of 2012-2015 were received post exposure prophylaxis with an average of 242 people infected annually. Among the reported suspected human rabies cases recorded 52.7% were children (less than 15years age). The recorded data showed the underestimate of rabies cases who took post exposure prophylaxis, which could be attributed due to the absence of organized recorded data management system. Therefore, based on the current study findings, regular intervention targeted at controlling stray dogs, administration of anti-rabies vaccination and awareness creation in one- health manner is strongly recommended to reduce the severity of this fatal diseases.

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INTRODUCTION

Rabies is the top most serious zoonotic viral disease that someone might encounter, especially veterinarians being at special risk. It is perhaps the deadliest of all human diseases, as once clinical symptoms appear; it is almost 100 percent fatal. WHO (2005) estimates that approximately 55,000 people die of rabies annually in World and that approximately 40 percent of the victims are children.

Human deaths are primarily from rabid dog bites, which account for 93%-96% of all animal bites in humans who report to health facilities for post exposure prophylaxis (Rhodes *et al*., 2002). Rabies is most common in children under 15 years of age. Dogs are the main reservoir and transmitter species of rabies in human and animal populations. Cats have also been found to be transmitters, and domestic animals such as cattle, buffalo, pigs, sheep and goats are susceptible to rabies infection. However, human rabies cases from exposure to these species are a minority. If rabies can be eliminated in the dog population, it can be

eliminated in the human population (Gongal, 2006). Thus, there is the likelihood of a disproportionately high number of young children contracting and dying of undiagnosed rabies (WHO, 2012).

Rabies is a central nervous system viral disease which is caused by the rabies virus and transmission occurs by bite with rabid animal and organ transplantation from rabies infected patients (Hellenbrand *et al*., 2005; Smith and McDonald, 2006). Rabies-infected animals have rabies virus in their salivary glands at high titers which can be even greater than in the brain (Charey, & McLean, 2002). Virus is usually present in the saliva of the affected animal during clinical disease but excretion may be intermittent. Experimental demonstration of virus in salivary glands or saliva several days before the onset of the disease in dogs and cats is cause for concern (Fekadu *et al*., 2004). There is a long and variable rabies virus incubation period in humans and animal which usually last 20 to 90 days but sometimes it takes longer than 1 year (Smith and, McDonald, 2006).

Rabies cases can be diagnosed by clinical manifestations and history but for more perfections, laboratory tests like fluorescent antibody test (FAT), enzyme linked immunosorbent antibody (ELISA) and mouse inoculation tests are very essential (Beauregard *et al*., 2003). A tissue culture infection test is now available, which allows demonstration of the virus in stained tissue culture cells within 4 days. This may replace the mouse inoculation test (Radostitis *et al*., 2006). The disease can be controlled and prevented; by vaccination. In Ethiopia individuals who are exposed to rabies virus often see traditional healers for the diagnosis and treatment of the disease. These widespread traditional practices of handling rabies cases are believed to interfere with timely seeking of post exposure prophylaxis (PEP). Rabies victims especially from rural areas seek post exposure prophylaxis (PEP) treatment after exhausting the traditional medicinal intervention and usually after a loss of life from family members (Meseret & Debasu, 2015).

In general, most developing countries including Ethiopia do not have the capacity for laboratory confirmation of rabies cases and most suspected rabies victims do not die in hospital both in humans and animals. So, rabies is underreported (Wilde and Lumlertdacha, 2011). Poor public awareness towards rabies is considered as one of the bottle necks for the prevention and control of the disease in Ethiopia especially in canine rabies endemic towns like Nekemte (personal communications).

Identifying status 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 (Tadele, *et al.,* 2014). Hence there is lack of accurate quantitative information on status of rabies about the disease to apply effective control measures in Ethiopia. Therefore, the objective of the current study is to reviewing of recorded data to generate baseline information on the status of rabies in Nekemte health center.

MATERIALS AND METHODS

Study Area and study period

The health center based retrospective study was conducted from November 2015 to April, 2016, on status of suspected rabies cases in humans recorded at Nekemte town health center. Nekemte town health center (NTHC) is located at 331km far from Addis Ababa in East Wollega Zone of Oromia regional state, Western Ethiopia. The average temperature in the area was 21^0c). The zone receives the minimum annual rainfall of approximately 1450mm and the maximum annual rainfall of 21500mm with the average rain fall of 1800mm. Altitude ranges from 1300-3140m above sea level and the district had various topographic features (NDAO, 2013).

Study design

Health center based retrospective study was conducted.

Study populations

All recorded data that were available in the study area from a period 2012 to 2015 and whose data was available at Nekemte Town Health Center in the form of rabies registration book.

Sample Size

In current study, the sample size was based on the incidence of animal bite and purposive sampling of retrospective record; the review was made on total 727 patients admitted for anti-rabies vaccine during 2012 to 2015 that were found to have partially complete record.

Inclusion and exclusion criteria

Those case admitted in Health Center and that were found partial complete record were included in this study. While, the excluded group is those who have an incomplete information about the status of the diseases on registered book.

Data Collection

A four year (2012-2015) registered information data about the occurrence of rabies in humans in the study area was collected. The recorded data were comprised of identification number, age, sex, residence, type of animals' cause bite, date of bite and site of bite were recorded.

Data Analysis

The collected data was clarified and the code was given accordingly. The coded data was entered in Microsoft Excel 2010 spread sheet and transfer to SPSS version 20 for statistical analysis. Descriptive statistics were computed as appropriate. Status of rabies in human was analyzed by descriptive statistics. Logistic regression models were fitted containing the appropriate independent variable (s) with 95% confidence interval and less than 0.05 level of precision.

RESULTS

During the period of 2012-2015, a total of 727 individuals, were bitten by rabies suspected animals and received anti-rabies post exposure vaccine in Nekemte health center. As the recorded data indicated that an average of 242 people infected annually and of these total reported human rabies cases the highest cases 383 (52.7%) were children (less than 15years age), while the smallest 12 (1.7%) case were recorded in adult people.

From the total of rabies suspected individuals 673 (92.6%), 34(4.7%), 13(1.8% and 7(1%) were bitten/infected by dogs, cattle, cat and equine species respectively.

Table1: Socio-demographic study on Retrospective Study from 2012-2015

Variables	Numbers of suspected case	Percentage (%)
Variable		
Residence		
Urban	659	90.6
Rural	68	9.4
Age		
1-15	383	52.7
16-30	308	42.4
31-45	24	3.3
>46	12	1.7
Sex		
Male	376	51.7
Female	351	48.3
Source of exposure		
Dog	673	92.6
Cattle	34	4.7
Cat	13	1.8
Equine	7	1.0
Years		
2012	250	34.4
2013	121	16.6
2014	145	19.9
2015	211	29.0

Concerning years of case recorded; the highest (250) of rabies suspected cases were occurred in the year of 2012, while smallest (121) of cases were recorded in the year 2013.

Table 2: cross tabulation result of different variables versus years of data recorded

Variables		Year				Total	X^2
		2012	2013	2014	2015		
Sex	Male	119(16.4)	66(9.1)	70(9.6)	121(16.6)	376(51.7)	0.142
	Female	131(18.0)	55(7.6)	75(10.3)	90(12.4)	351(48.3)	
Kebele	Rural	30(4.1)	7(1.0)	13(1.8)	18(*2.5*)	68(9.4)	0.25
	Urban	220(30.3)	114(15.7)	132(18.2)	193(26.5)	659(90.6)	
Age	1-15	140(19.3)	54(7.4)	63(8.7)	126(17.3)	383(52.7)	0.034
	16-30	95(13.1)	62(8.5)	75(10.3)	76(10.5)	308(42.4)	
	31-45	10(1.4)	4(0.6)	3(0.4)	7(1.0)	24(3.3)	
	>45	5(0.7)	1(0.1)	4(0.6)	2(0.3)	12(1.7)	
Source of exposure	Dog	199(27.4)	120(16.5)	143(19.7)	211(29.0)	673(92.6)	0.001
	Cattle	33(4.5)	1(0.1)	0	0	34(4.7)	
	Equine	5(0.7)	0	2(0.3)	0	7(1.0)	
	Cat	13(1.8)	0	0	0	13(1.8)	

The occurrence of rabies with regard to season, a greater number of rabies suspected cases were recorded in winter of 2014, while lower numbers in spring of 2015 year. This finding is indicated that, the trend of rabies is fluctuating among this season.

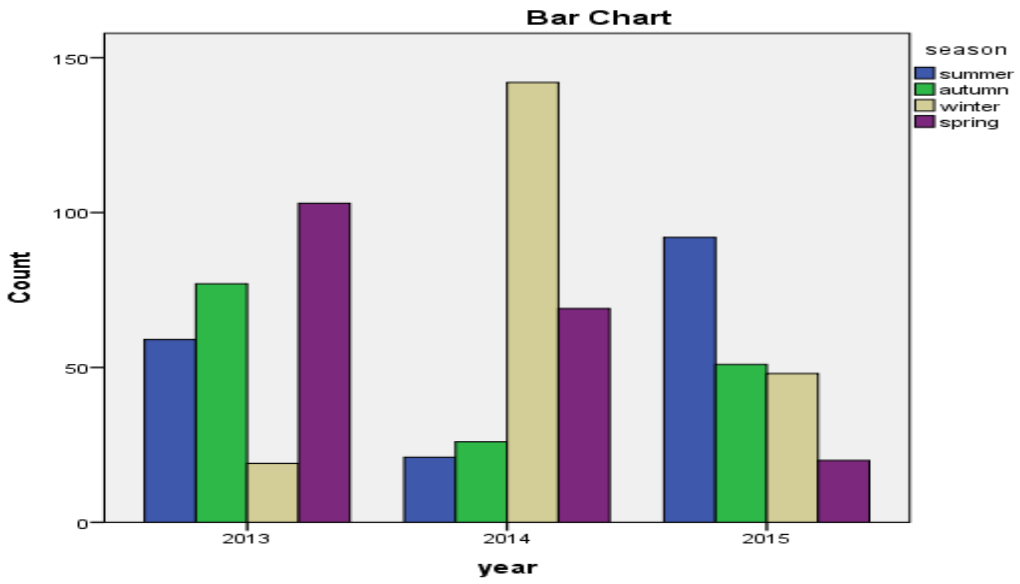

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Figure 1: Temporal trend of rabies status in the years of 2012-2015 in Nekemte health center

DISCUSSIONS

A total of 727 human rabies exposure cases were recorded from Nekemte town Health Center from 2012 to 2015. The current finding indicated that the distributions of human rabies exposure cases from 2012 to 2015 were fluctuating among study years. The sex specific distribution showed that the majority of rabies exposure cases were among males (51.7%). This finding was supported by a previous Ethiopian study and a Nigerian study (Meseret and Debasu, 2015; Tadele *et al.,* 2014; Abu-Bakr, and Bakari, 2012). This might be explained by the activities males are frequently involved do more nightly and outdoor activities while females are more likely to remain indoors due to cultural and religious reasons.

With regarding to age; children less than 15 years of age were the most victim (52.7%) group. As well as the number of rabies exposure decreased from children, young and adult; this is might be because of most children were play with dogs and straight on road in Ethiopia cultures. The finding agreement with (Tadele *et al.,*2014) from jimma areas, who reported that, major numbers (52.6%) of human rabies cases, were recorded in children aged 1-14 years, while small numbers in adult above 50 years age category.

Additionally, agreement with Deressa*, et al* (2010), showed that the most cases were 42% from the age group 0-14 category and the minimum (15.54%) deaths were recorded in 50 years and above age category. Moreover, Yimer *et al.,* (2012), reported (39.3%) of the dog bite victims that sought the treatment were children under 15 years of age. The WHO data reported that most (30 to 50%) of the victims of rabies reported from Africa and Asia were children (WHO, 2005).

In current study, 84.7% of the injured patients were bitten on their legs compared to the other body parts. This is in agreement with the reports of (Tadele *et al.,* 2014) who reported that bite on legs were the commonest in rabid animals. Additional the report of WHO, (2008) show that the majority of victims were bitten on their lower limb.

A finding of the present study was showed that, rabies cases had not significant peak in monthly distribution of rabid dogs. This information suggested that dogs appear to bite people at constant rate throughout the year with constant risk of contracting rabies by human from the bites of these dogs and this finding is supported by the study reported by Ethiopian Health and Nutritional Research Institution (Fetene *et al.,* 2014*).*

CONCLUSION AND RECOMMENDATIONS

As the recorded data indicated a total of 727 people bitten and treated with post exposure vaccine, an average of 242 people infected annually and of these total reported fatal human rabies cases 52.7% were children (less than 15years age), 42.4% were young (16-30) years age and 3.3% were adult people (31-45 years), and greater than 46 years (>46) were older people. From the total of rabies suspected individuals 673(92.6%) were bitten/infected by dogs. The Federal Ministry of Health and Ministry of livestock and fishery resource development should work in cooperation to forward information related to rabies and the availability of preventive measures like vaccinations both for human and animal; mass dog vaccination programme should be performed by veterinarians at regular intervals.

Competing interests

All authors declare that they have no conflict of interest associated with the publication of this manuscript.

Authors' contributions

Conceived and designed the experiments: NF and TK. Performed the experiments: NF. Analyzed the data: NF and TK. Contributed

reagents/materials/analysis tools: NF and TK. Wrote the paper: NF and TK. Assisted with design, analysis, and interpretation of data: TK, Critical review of the manuscript: TK. Read and approved the final manuscript: NF, TK, Critical appraisal of the manuscript: NF, TK.

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