

Assessment of Community Awareness and Retrospective Study on Lumpy Skin Disease in Guto Gida, Wayu Tuka and Gidaayana Districts, Eastern Wollega, Ethiopia

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Abstract: A cross sectional and retrospective study was conducted from November, 2014 to May, 2015 to determine community awareness on Lumpy Skin Disease (LSD) in three selected districts (Guto Gida, Wayu Tuka and Gida Ayana) of Oromia regional state of Ethiopia. A total of 402 questionnaires were equally distributed to households of the study area, of which 11.69 % were literate and 88.31% was illiterate. Out of the total 402 respondents, 288 (71.64%) respondents responded that as their animals had LSD. In the current study of questionnaire survey, the awareness of community towards LSD in the Gida Ayana (lowland), Guto Gida (highland) and Wayu Tuka (midland) districts were 79.85%, 64.93% and 70.15% respectively. The difference in awareness, season and vaccination of LSD area were found to be statistically significant ($P < 0.05$). This study it was found that majority of the respondents (45.52%) claimed that only one animal is diseased and only 2.24% of the respondents said that 4 animals were diseased by LSD. The average morbidity rate of the disease in the study area was 17.91%, where as the average mortality rate was 8.96%. Regarding to the finding from recorded data during 2013 up to 2014 year males (65.00%) were more affected than females (35.00%). It was also found that young animals (63.78%) were more affected than adult animals (36.22%). Similarly, higher outbreak was recorded in the year 2005(67.30%), compared to the year 2006 (32.70%). From the retrospective data higher percentage of LSD was recorded in Gida Ayana district (49.46%), followed by Wayu Tuka (34.32%) and Guto Gida districts (16.22%). However, the overall awareness of LSD among districts was 71.6%. As the study showed that most respondents aware of LSD in Gida Ayana followed by, Wayu Tuka and Guto Gida districts.

Key words: Awareness • Cattle • Gida Ayana • Guto Gida • Lumpy Skin Disease and Wayu Tuka

INTRODUCTION

Ethiopia has more domesticated animals than any other country in Africa and agriculture is the mainstay of the Ethiopian economy. Agriculture accounts for about 45% of the total Gross Domestic Product and 85% of export earnings of the country. Official figures from the Central Statistics Authority give a national cattle population of 35.4 million heads [1]. Livestock plays a critical role for the majority of the Ethiopian population in terms of income, savings, food security, employment, traction, fertilizer and fuel. This sector is also important to the national economy, contributing 16% of the total GDP,

one-third of agricultural GDP and eight percent of export earnings [2]. In Ethiopia Livestock production is an integral part of the agriculture system. The livestock subsector accounts for 40% of the agricultural gross domestic product (GDP) and 20% of the total GDP without considering other contribution like traction power, fertilizing and mean of transport [3].

Lumpy skin disease is one of the most economically significant Trans-boundaries, emerging viral diseases. It is currently endemic in most Africa countries and expanded to Middle East region [4]. It is a disease with a high morbidity and low mortality rate and affects cattle of all ages and breeds. It causes significant economic

problems as a result of reduced milk production, beef loss and draft animals, abortion, infertility, loss of condition and damage to the hide [5]. It becomes an important threat to livestock and dairy industry in the Middle East and Africa [6]. LSD was first observed in the western part of Ethiopia (Southwest of Lake Tana) in 1983. It has now spread to almost all the regions and agro ecological zones [7].

LSD is one of the most serious poxvirus diseases of cattle caused by lumpy skin disease virus (LSDV) within the genus Capripoxvirus [8]. Lumpy skin disease is infectious, eruptive and occasionally fatal disease of cattle. It is an acute to chronic viral disease characterized by skin nodules in the skin and other body parts. It might be exacerbated by secondary bacterial complication [9].

The World Organization for Animal Health [OIE] categorizes LSD as a notifiable disease because of the substantial economic impact of an outbreak. Restrictions to the global trade of live animals and animal products, costly control and eradication measures such as vaccination campaigns as well as the indirect costs because of the compulsory limitations in animal movements cause significant financial losses on a national level [4]. Lumpy skin disease is a pox disease of cattle characterized by fever, nodules on the skin, mucous membranes and internal organs, emaciation, enlarged lymph nodes, edema of the skin and sometimes death. The disease is of economic importance as it can cause a temporary reduction in milk production, temporary or permanent sterility in bulls and damage to hides and death due to secondary bacterial infections [10].

The principle method of transmission is mechanical by arthropod vector. Though no Specific vector has been identified to date, mosquitoes [e.g. *Culexmirificens* and *Aedesnatrionus*] and flies [e.g. *Stomoxyscalcitransand Biomyiafasciata*] could play a major role. Direct contact could be a minor source of infection. Transmission may also occur by ingestion of feed and water contaminated with infected saliva [11]. For countries free of the disease, the introduction of the disease can be prevented by restriction of the importation of the animals and their products but in those nations which experience the infection can limit the spread of the lumpy skin disease by restriction of the animal movement from one place to another, quarantine, keeping of sick animals well apart from the rest of the herd and must not share drinking or feeding troughs by making awareness creation of the farmers [12]. Antibiotics also given to prevent the secondary bacterial complication as the defense

mechanism of the body weakened which can prolong the complete recovery of the diseased animals [5]. The outbreak of Lumpy Skin Disease is common in wollega area, especially in study area.

Therefore the objectives of this study were:

- To assess community awareness towards LSD in the study area
- To determine the magnitude of LSD cases from recorded data in the study area

MATERIALS AND METHODS

Study Area: The study was conducted in three districts (Gida Ayana, Guto Gida, Wayu Tuka) of east Wollega zone located at 331-400 km West of Addis Ababa. The approximate geographical location of the area is between 90 4' 7N to 90 11' 02N and 360 30'E to 360 43' 02E. The altitude found in this zone was highland, midland and lowland. And the maximum temperature is 27.4oc and the minimum temperature of the area is about 10.2°C. The mean annual rainfall of the area ranges from 1600mm to 2000mm. The area receives long heavy rainy season from June to September and short rainy season from March to May. Among the various soil types in the area, the red brown soil with a PH ranging from 5-7 is the predominant type of soil in the Zone. The area is rich in natural vegetation that comprised of the tropical rain forest tree, all grasses and bushes [13].

Study Animal: The study animal for this study was constitutes of those cattle kept under extensive traditional production management system in Guto Gida, Wayu Tuka and Gida Ayana districts, where large population of cattle were found. Total samples of 402 cattle owned households were included in this study and 740 sick cattle were found in retrospective data.

Study Design: A cross sectional and retrospective study was conducted from November, 2014 to May, 2015 to determine LSD community awareness in the study area.

Study Methodology

Questionnaire Survey: A questionnaire format was designed and an attempt was made to generate base line information about Lumpy skin disease, which a basic health problem of Cattle at the area considered as important by farmers and measures was taken by farmers against the diseases. The questionnaire are designed to

obtain information from the owner of the animal in three districts. A random house-to-house survey using a pre-tested questionnaire consisting of two parts was conducted. The first part capture information on household such as household's location, level of education of household head and number of Cattle owned. The second part was focused on practices identified elsewhere to facilitate the spread of the disease. The questionnaire was framed in such a way that farmers can give information that were recent and easy to recall and it was filled directly by interviewing randomly selected farmers from different three districts surrounding peasant associations.

Retrospective Study: Retrospective study was carried out by referring case book record of diseased animals that came to three districts veterinary clinic from November, 2014 to May 2015 in the last two years.

Data Management and Analysis: The collected raw data was entered in to Microsoft Excel 2013 program. The collected data was properly coded and entered in to a spreadsheet and analyzed using STATA version 11 software. Descriptive statistics was employed and expressed in terms of frequency and percentage. Chi-square statistics were used to determine the association of the disease with the risk factors. P-value of 0.05 was regarded as cut-off point for statistical significant difference for all analysis.

RESULTS

Results of Questionnaire Survey: In the present study equal numbers of questionnaire were administered to each district of the study area. A total of 402 questionnaires were distributed to households of the study area, of which 11.69 % were literate and 88.31% was illiterate. Out of the total 402 respondents, 288 (71.64%) respondents responded that as their animals had LSD. The livelihood back ground was indicated that 2.49% were only engaged in livestock rearing and 97.51% were engaged in mixed crop livestock farming system. Most of respondents responded that the LSD identified from other disease by forming of nodules (51.64%) (Table 1).

Table 1: Characteristics of the respondents

Variables		Percentage N [%]
Educational level	Illiterate	88.31
	Literate	11.69
Livelihood background	Livestock only	2.49
	Mixed crop livestock	97.51
Herd size	>5	28.86
	6-10	52.49
	11-15	17.16
	16<	1.49
How identify LSD	Forming of nodules	51.64
	Seasonal	14
	Hyper salivation	6
	No response	28.36

Table 2: Knowledge assessment of the respondents

Variables	LSD		Chi-square x ²	P-value
	Awareness [%]	Not Awareness [%]		
District				
GidaAyana	107 [79.85]	27 [20.15]	7.5669	
0.023GutoGida	87 [64.93]	47 [35.07]		
WayuTuka	94 [70.15]	40 [29.85]		
	= 71.6%	=28.4%		
Altitude				
Highland	87 [64.93]	47 [35.07]	7.5669	0.023
Mid-land	94 [70.15]	40 [29.85]		
Lowland	107 [79.85]	27 [20.15]		
Season				
No response	0 [00.00]	114 [284%]	402.00	0.00
Spring	259 [64.40]	0 [0.00%]		
Autumn	29 [7.2]	0 [0.00%]		
Vaccination				
No response	0 [0.00]	113 [28.36]	397.0952	0.000
Yes	283 [70.40]	0 [0.00]		
No	5 [1.24]	0 [0.00]		

Table 3: Knowledge assessment of the respondents

Variables	Numbers [%]
Morbidity	
No response	114 [28.36]
1 animal diseased	183 [45.52]
2 animal diseased	71 [17.66]
3 animal diseased	25 [6.22]
4 animal diseased	9 [2.24]
Mortality	
No response	114 [28.36]
No animal died	216 [53.73]
1 animal died	63 [15.67]
2 animal died	9 [2.24]
Season flies	
Summer	108 [26.87]
Autumn	111 [27.61]
Spring	183 [45.52]

Table 4: percentage of LSD of cattle that in three districts of veterinary clinic

Variables	Percentage N [%]
Sex	
Male	481 [65.00%]
Female	259 [35%]
Age	
Young	472 [63.78%]
Adult	268 [36.22%]
Year	
2005	498 [67.30%]
2006	242 [32.70%]
District	
GidaAyana	366 [49.46%]
GutoGida	120 [16.22%]
WayuTuka	254 [34.32%]

Assessment of Awareness Community Toward LSD:

In the current study, 79.85%, 64.93% and 70.15% of the community from Gida Ayana (lowland), Guto Gida (highland) and Wayu Tuka (midland) districts were aware about LSD respectively and the overall awareness among districts were 71.6%. During this study, most respondents responded that LSD cases were occurred in the spring season [64.40%] than autumn season (7.20%). Majority of respondents (70.40%) responded as their animals were vaccinated. The difference in awareness, season and vaccination of LSD among the three districts of the study area was found to be statistically significant (P<0.05) (Table 2).

Assessment of the Respondents: This study it was found that majority (45.52%) of the respondents claimed that only one animal is diseased and only 2.24% of the respondents said that 4 animals were diseased by LSD. The average morbidity rate of the study area was 17.91%.

The average of mortality rate of the study area was 8.96%, with 15.67% of respondents respond as 1 animal died and 2.24% of respondents responds as 2 animal died. The study showed there was a variation of population flies in season during questioner survey such as summer (26.87%), autumn (27.61%) and spring (45.52%) (Table 3).

Retrospective Study: Retrospective study was carried out by referring case book record of sick cattle that come to three districts veterinary clinic from November, 2014-May 2015. According to the finding from the clinic case book record from the total of 740 sick cattle that were tentatively diagnosed in clinic during 2013 up to 2014year. In the study males (65.00%) were more affected than females (35.00%). It was also found that young animals (63.78%) were more affected than adult animals (36.22%). Similarly, higher outbreak was recorded in the year 2005 (67.30%), compared to the year 2006 (32.70%). From the retrospective data higher percentage of LSD was recorded in Gida Ayana district [49.46%], followed by Wayu Tuka (34.32%) and Guto Gida districts (16.22%) (Table 4).

DISCUSSION

The awareness of LSD respondents in relation to the three altitudes (low, mid and high land) indicates that there is a higher awareness of disease in the lowland (79.85%) than in the high land (64.93%) and midland altitude (70.15%). This might be due to the warm and humid climate in midland and lowland agro-climates might be considered a more favorable environment for the occurrence of large populations of biting flies than the cool temperature in the highlands. In the present study, the overall awareness of LSD among districts was 71.6%. The findings of the present study disagree with the study conducted by Belay, *et al.* [14] in Jimma town, found that the awareness of LSD was 13%. Similarly, The findings of the present study disagree with the study conducted by Nibre and Basaznew, [15] in Lay-Armacheho district, Northwestern Ethiopia, found that the awareness of LSD was 11, 38%. The difference in the awareness of LSD toward community were might be due to large populations of biting flies that CauseLSD were found in present study area and LSD was endemic and common in the study area. During present study of questionnaire survey, morbidity rate and mortality rate is 17.91% and 8.96% respectively. This finding is in agreement with the study conducted by Davies, [16] found that LSD is a disease with high morbidity (1-90%) and low mortality (<10%)

rates. However, the current study is not in line with the study conducted in Sultanate of Oman by Mohammed *et al.* [17] Morbidity and mortality rates due to LSD were recorded as 27.9 and 5.5%, respectively.

The variation in percentage of LSD might be due to the morbidity and mortality rates for LSD vary greatly in different endemic areas depending on the severity of strain, prevalence of insect vectors and susceptibility of the host. During the study of the retrospective data, percentage of the disease in male was higher than female animals. This finding agrees with the study conducted by Tuppurainen [4] found that the percentage of LSD in male animals was higher than the percentage in female animals with the number of 740 cases. This might be due to the exposure of male animals to high risk factors than female animals; male animals over a long distance for drafting power and feed searching, while most of the time female animals are confined around the village for local milk production. According to the current study, more cases of LSD were found among young animals than adult animals. This find is in line with House [19], young calves are usually more severely affected. This might be due to theseverity of the disease depends on the dose of the inoculums as well the susceptibility of the host and the route of exposure.

CONCLUSIONS

Awareness of the disease is related to the distribution of vectors and the Severity of LSD is highly increased at the end of rainy season, which associated with the increase of fly population. In relation to altitude, the Awareness of respondents toward LSD disease was most common in low altitude, because of the occurrence of high vector population. In addition to the above mentioned, The disease causes serious economic losses in most African countries including Ethiopia because this disease has significance importance due to the prolonged loss of productivity from high morbidity, restrictions to the global trade of live animals and animal products, costly control and eradication measures.6.

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