

Major Causes of Lameness in Cart-Horses in Jimma Town, Oromia, South-West Ethiopia

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Abstract

A cross-sectional survey was carried out in Jimma town to determine the distribution and causes of lameness in cart-horses. A semi-structured questionnaire was designed and administered to collect all important data from April 2018 to May 2018. A total of 384 horse owners were interviewed to assess the possible cause of lameness. Statistical analysis was done by using SPSS software version 20. Among the total of 384 study participants interviewed 63.5% of them reported that their horse got injuries resulting from different sources. Mechanical injury was recorded the highest (48.6%) causes of lameness whereas car accident was found to be the least. However, no significant ($P>0.05$) variation among the causes, level of education and age of the owners were documented. Respondents stated that, 65.2%, 29.9% and 4.9% of lame horses were managed by veterinarian and para-veterinarians, traditional healers and by themselves, respectively. In conclusion, the current study has revealed a high occurrence of lameness in cart-horses and mechanical injury is identified as major cause. Thus, awareness creation to horse owners and cart-horse drivers is important to prevent the occurrence of lameness.

Keywords: Cart-horses; Lameness; Jimma town

Introduction

The equine population of the world was reported to be 122.4 million with 40 million donkeys, 15 million mules and 43.3 million horses. In Africa, the number of equines was in the range of 17.6 million comprising 11.6 million donkeys, 2.3 million mules and 3.7 million horses [1]. According to CSA [2], there are about 2.03 million horses, 7.43 million donkeys, 0.4 million mules, and about 1.16 million camels in the sedentary areas of Ethiopia. Even if, equine play a significant role in the economy of a country, the government livestock development programs and those of aid agencies are aid toward increasing milk, meat, egg and wool production. Equines have been completely neglected and omitted from the agricultural system and their role in production is not yet well recognized and magnified in developing countries. The natural choice rest on the use of human and pack animal mode of transport and it has been the case in some part of the world including Ethiopia [3].

Lameness is an abnormal gait or stance of an animal that is the result of dysfunction of the locomotors system. In the horse, it is most commonly caused by pain, but can be due to neurologic or mechanical dysfunction. Lameness is a common veterinary problem in racehorses, sport horses, and pleasure horses. It is one of the most costly health problems for the equine industry, both monetarily for the cost of diagnosis and treatment, and for the cost of time off resulting in loss-of-use [4].

Working horses are employed in agriculture, transportation of people and goods tourism and ceremonies [3]. In Ethiopia horses are used for fetching water, for household shifting, for carrying the sick to hospital, for transportation, hoping and for pulling materials needed for construction [5]. Many of these horses frequently work long hours

in harsh conditions, often experiencing dehydration and multiple chronic conditions, leading to poor welfare. Diseases or injuries of the musculoskeletal system are the major cause of wastage and poor performance in working horses. Lame horses expend more energy than sound horses at a given speed. Slower progress during work, due to lameness, and decreased work outputs reduces income for the mostly poor horse owners [6]. The cause of lameness is multi-factorial and its occurrence is associated with risk factors. Therefore, this study was aimed to determine the distribution and causes of lameness in cart-horses.

Materials and Methods

Study area

The study was conducted from April, 2018 to May, 2018 at Jimma town, which is located at about 352 km south west of Addis Ababa. Geographically, the town is lies between a latitude of 7°41'N and longitude of 36°50'E and it receives a bimodal rain fall with an average annual rain fall of 1530 mm. The mean annual maximum and minimum temperature ranges from 25°C-30°C and 7°C-12°C, respectively [7]. According to the statistical data obtained [8], Jimma zone has a livestock population of 2, 016, 823 cattle, 288, 411 goats, 942, 908 sheep and 74574 horses, 49, 489 donkey, 28, 371 mules and 1, 139, 735 poultry.

Study design

A cross-sectional survey was carried out in Jimma town to determine the occurrence and associated risk factors of lameness in cart-horses. The study was conducted using questionnaire survey. A semi-structured questionnaire was administered by personal interview to collect all important data from April 2018 to May 2018.

Source and study population

All cart-horses found in Jimma town were the source population. The selected horses from this source population found in Jimma town were the study animals. The study was conducted from April, 2018 to May, 2018 in Jimma town. The study design was done by a questionnaire to study the cause and associated risk factors of lameness in working cart horses.

Sample size determination and sampling strategy

The total sample size (n) for a cross-sectional study was calculated basing on the predetermination of the following parameters: 50% estimated prevalence, 95% level of confidence, and 5% desired level of precision as methods described by Thrusfield [9].

$N = 1.962 \times P_{exp} (1 - P_{exp}) / d^2$, Where; n=Number of Study Population, P_{exp} =Expected Prevalence and d=Desired Precision.

Using the above formula, the calculated sample size was 384. As the information obtained from Jimma town cart-horse association, the estimated horse population in the study area was 1252. Since the required sample size (n) was 384; the study animals were selected by systematic random sampling method (SRSM) as follows: $X = 1252 / 384 = 3$; thus, every 3 horse interval the sample was collected.

Data collection

Semi-structure questionnaire with regard to the risk factors for the occurrence of the lameness was developed and administered to selected horse owners in Jimma town. The study was conducted from April 2018 to May 2018 in Jimma town, South-Western Ethiopia.

Data analysis

Information collected through questionnaire was extracted and summarized for analysis using SPSS statistical software computer programs (SPSS version 20). Descriptive statistics like percentage and frequencies were computed. Pearson's Chi square test was used to evaluate relationship between different variables.

Results

The demographic characteristics of respondent are summarized in Table 1. The majorities (99.5) of the respondents were found to be male and their age distribution includes 18-29 years (67.4%), 30-60 years (31%) and above 60 years (1.6%). The educational background of study participant was (63.3%), (20.1%), (0.0%) and (16.7%) attended in primary, secondary, college graduate and not go for education, respectively.

Description	Category	Frequency	Percent (%)
Sex	Male	382	99.5
	Female	2	0.5
Age	18-29	259	67.4
	30-60	119	31
	above 60	6	1.6
	Illiterate	64	16.7
	Primary	243	63.3
Level education	Secondary	77	20.1
	College/University	0	0

Table 1: Demographic features of study participants.

From a totally 384 Study participants interviewed 63.5% of them were reported to encountered lameness to their horse within last 12 months (Table 2). According to their perception mechanical injuries while working was the frequent and most common (48.6%) cause encountering them, whereas car accident accounts the least (8.6%) cause. However, no significant ($P > 0.05$) variation among the causes, level of education and age of the owners were documented (Table 3). Respondents described that, 65.2%, 29.9% and 4.9% of lameness problem were managed by veterinarian and para-veterinarians, traditional healers and by themselves, respectively.

Description	Category	Frequency	Percent (%)
Lameness within last Twelve months	Yes	244	63.5
	No	140	36.5
Causes of lameness faced to your horse	Mechanical	118	48.6
	Pierce/cut	66	27.2
	Hyena bite	38	15.6
	Car accident	21	8.6
Who was manage the lameness	Veterinarian	159	65.2
	Traditional healer	73	29.9
	Yourself	11	4.9

Table 2: Frequency of lameness in horses and the management practices.

Variables	Frequency	Percent (%)	χ^2	P-value
Causes of lameness				
Injury while working	118	48.6		
Deliberate cutting	66	27.2		
Hyena bite	38	15.6	4.539	0.234

Car accident	21	8.6		
Age of respondents				
Between 18-29 year	259	67.4		
Between 30-60 year	119	31	3.55	0.154
Above 60 year	6	1.6		
Respondents education background				
No formal education	64	16.7		
Primary school	243	63.3	3.08	0.219
Secondary school	77	20.1		
College/University	0	0		

Table 3: Possible risk factors for the occurrence of lameness.

Discussion

Our study indicates that about 99.5% of respondents are male. The maximum number of male horse owners in the current study area might be due to the fact that males are closely related to horse handling. This finding is in accordance with the reports of Asmare et al. [10] and Wolelie et al. [11] in different parts of Ethiopia.

The majority (67.4) of cart horse drivers interviewed were between 18-29 age groups. Relatively similar figures have been reported elsewhere by Solomon et al. [12] and Asmare et al. [10] in and around Metekel zone, north-western Ethiopia. In addition to this our finding is in line with Bekele et al. [13]. Majority of respondents in the present study area are primary school (63.3%) attended, which is also in agreement with the findings of Demoze [14]. Statistically insignificant variation ($P>0.05$) is identified in the occurrence of lameness among diverse educational status and age categories of the respondents.

In the present study, among the participants interviewed, 63.5% reported that their horse got injuries resulting from mechanical injuries while working, deliberately piercing/cutting, hyena bites and car accident. Mechanical injury is recorded the highest (48.6%) causes of lameness and car accident is found to be the least cause. Comparable results are reported by Bifa and Woldemeskel [5] and Tadesse [15]. However, no significant ($P=0.234$) difference among different causes of lameness are observed. This indicates the absence of difference among the different causes of lameness in horses in the current study area.

With respect to the measures (managements) taken to injured horses, almost more than half of the respondents used to take their horses to veterinary clinic, one fourth of respondents prefer traditional healers, while very few of them treat their animals themselves. Similar result with this study has been reported by Bekele et al. [13]. It is critical to correctly determine the cause of the lameness, because treatment varies greatly depending on the cause. Some causes of lameness produce very characteristic and classically described gaits [16]. Generally, lameness is one of the major factors for working equine leading to low performance and power or energy generation and loss of animal and having high economic impact.

Conclusion

The current study has revealed a high occurrence of lameness in cart-horses and mechanical injury is identified as major cause. Horses suffered from lameness are also treated by traditional healers and by the owners. However, the practice of treating by non-professional person can be inappropriate and may take long time to heal. Therefore, awareness creation to the horse owners and cart-horse drivers is important to prevent the occurrence of lameness resulting from different causes. In addition, horses suffered from lameness must be treated by veterinary professionals.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Author's Contributions

Jemal Milkeso, Jibril Eda'o, Kamila Aliyi, Kefyalew Yiredaw and Kemal Abdo designed the study and collected the data. Bashahun GM supervised data collection, analyzed the data and prepared the manuscript.

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