



Study on Causes and Occurrence of Lameness on Cart Horses in Asella and Robe Towns East Arsi Zone South East Ethiopia

Jemal Siraj, Belay Walelign, Tekalign Woldehana

Jimma University College Of Agriculture And Veterinary Medicine School Of Veterinary Medicine
P.O.B 307, Jimma, Ethiopia

Abstract

The study was conducted from November 2015 to April 2016 in two towns. Namely Asella and Robe to determine the prevalence, causes and associated risk factors of lameness in carthorses and forwarded relevant recommendations that keep the carthorses health for sound performance.

The objective was achieved through physical clinical examination and questionery survey. The clinical examination finding indicated that the overall prevalence of lameness was 30.5%. prevalence of 32.5% (78/240) in Asella and 27.1(39/144) in Robe was observed. There was no statistically significant difference ($p>0.05$) in the prevalence of lameness between two towns, however there was statistically significant difference ($p<0.05$) in the case of lameness between towns.

Overall 59.6% of owners reported lameness occurred in their carthorses. The survey also revealed that poor housing, standing in muddy area for longer time, improper shoeing, less hoof care and roughness of the area were the predisposing factor for lameness. In conclusion, lameness was a problem of carthorses the study towns. Most of the lameness problems were associated with mismanagement. Education and extension of owners with particular emphasis on regular hoof care and proper housing management were recommended. In addition, upgrading the skill of local farriers on proper shoeing was also recommended.

Keywords: carthorses, prevalence, risk factors, Arsi, lameness

Introduction

There are over 42 million horses in developing countries (FAOSTAT, 2006), most of which provide essential traction power and employment opportunities in the world's poorest communities (Pritchard *et al.* 2005).

Ethiopia possesses about 2.75 millions horses (EARO, 1999). Horses play a dominant role in the equine group due to its physical and psychological characteristics in comparison with other equines. Horses usually have a larger and more substantial frame. It easily acquires

conditioned reflexes, demonstrates drought abilities and shows great willing to undertake such work. The horse is very fast in motion, quickly reacts to many commands and submits readily to his will(FAO, 1984).The foot is probably the most source of lameness and frustration in horses used for any purpose regardless of rigor or athletic requirement. Most lameness originated from lesions located in the distal limb. The major causes of lameness are thrush, nail puncture, foreign objects, cracks, contacted heels and combination of seedy toes (Bradley, 1981).

Horses involved in pulling carts often work continuously for 6 to 7 hours/day, carrying 2 to 3 persons and goods (200–300 kg) in a single trip. They are provided with grasses during the night and allowed to graze on pasture in the town fringe during the day. The increasing human population, demands for transport of goods to and from far, remote areas, and construction activities around the town are making equines highly demanded animals. Feed shortage and disease are the major constraints to productivity and work performance of cart horse in the study area. Therefore the objective of this study is:

➤ To assess the occurrence, cause and associated risk factors of lameness in carthorses in Asella and Robe towns of Arsi, Oromia, Ethiopia.

Materials and Methods

Study Area

This study was conducted in Oromia Regional State; Arsi zone; Asella and Robe towns. Asella is located at a distance of 175kms south east of Addis Ababa. The climatic condition of the town is woyneda and the town is located at altitude 2350 to 2400m a.s.l.The day and night temperature of this town ranges from 10 degree Celsius to 25 degree Celsius and 10 to 20 degree Celsius respectively. The area has bimodal rain fall occurring from March to April (short rainy season) and from July to October (long rainy season) with annual rain fall of 3500-3550mm

and relative humidity of 43-60%.The Robe town is located at a distance of 223kms southeast of Addis Ababa. The climatic condition of the town is woyneda and this town has a latitude and longitude of 09°36 N 39°08 with an elevation of 2435 meters above sea level.

Study population

The study animals were carthorses in Asella and Robe town.

Study Design

Cross-sectional study designs were employed to identify the occurrence and causes of lameness in carthorses. The study animals were selected using simple random sampling method.

Sample Size

The desired sample size will be calculated using the standard formula described by Thrusfield (Thrusfield, 2005) for simple random sampling method. Since there was no previous work done on this area, the expected prevalence is guessed to be 50%.

Therefore, the sample size in this study will be calculated using the following formula (Thrusfield, 2005).

$$n = \frac{(1.96)^2 p (1-p)}{d^2}$$

Where;

n = Sample size

p = Expected prevalence (50%)

1.96 = the value of Z at 95% confidence level

d = Desired absolute precision = 5%

Study Methodology

Questionnaire survey

Semi structured questionnaire survey were designed to collect data on information related to cause and occurrence of lameness .In addition, risk factors associated with lameness such as care of the feet, average weight load, number of people

transported at a time, housing condition, working hours per day, nature of working ground, shoeing materials were included in interview. Accordingly a total of 240 cart horses’ owners in Asella and 144 cart horses’ owners of Robe were interviewed.

Data Analysis.

The Collected data were entered to computer using excel software data. Data were listed in a format i.e. rows for horse plate number, site of study and respondents, and column for different responses of owners and diagnostic out comes. SPSS 20 for window was used for data analysis. In the analysis confidence level was held at 95% and $p < 0.05$ was set for significance.

Results

In the present study 384 carthorses owners were intervened for lameness investigation among these 240 carthorses owners were from Asella town and 144 were from Robe. In Asella town From 240 total respondents said that 78 carthorses were lamened and out of 144 Robe carthorses respondents said that 39 were lamened. The total prevalence of lamened carthorse in both Asella and Robe towns were 59.6%. From the two towns the prevalence lamened carthorse was higher in Asella (32.5%) and lower in Robe (27.1%). The association of lamened carthorses among two towns was statistically insignificant ($p > 0.05$) (table1).

Table1: prevalence of lameness in study towns

| Towns | Total carthorse examined | Number of lamened carthorses | Percentage |
|------------------|--------------------------|------------------------------|------------|
| Asella | 240 | 78 | 32.5 |
| Robe | 144 | 39 | 27.1 |
| Total | 384 | 117 | 59.6 |
| $\chi^2 = 1.246$ | | p- value = 0.26 | |

In the present study 384 carthorses were examined for lameness investigation. From 117 total lamened carthorses 78 were from Asella and 39 were from Robe. In Asella 240 carthorses were examined and 32.5% were found to be lamened. The identified causes were associated with hoof (42.9%), fetlock joint (14.3%), hock and carpal

joint (28.6%), elbow, stiflejoint and muscle associated (14.3%). In Robe 144 carthorses were examined and 27.1% were found to be lamened. The identified cause were associated with hoof (33.3%), Pastern and fetlock joint (33.3%), elbow, stifle joint and muscle associated (33.3%) (table2)

Table 2: General anatomical site associated lameness in study towns

| Causes | Asella | Robe | Total |
|-------------------------------------|-----------|-----------------|---------|
| Hoof associated | 48(42.9%) | 16(33.3%) | 64(40%) |
| Pastern and fetlock associated | 16(14.3%) | 16(33.3%) | 32(20%) |
| Carpus and hook associated | 32(28.6%) | 0 | 32(20%) |
| Stifle, elbow and muscle associated | 16(14.3%) | 16(33.3%) | 32(20%) |
| Total | 112 | 48 | 160 |
| $\chi^2 = 30.48$ | | p- value = .000 | |

Having different Body condition of animal contribute to lameness mean that cart horse with poor, medium and good condition have:14.3%,66.7% and 50% have respectively this summarized as follows (table2)

| Body condition score | frequency | X ² | P value |
|----------------------|------------|----------------|---------|
| Poor | 16(14.3%) | 53.29 | .000 |
| Medium | 32(66.7%) | | |
| Good | 112(50%) | | |
| Total | 160(41.7%) | | |

Weight which owners packed to their cart horses without consideration could led to lamened horses as follows (table3)

| Average weight load | Presence of lameness | X ² | Pvalue |
|---------------------|----------------------|----------------|--------|
| Less than 200KG | 128(50%) | 21.9 | 0.000 |
| Greater than200KG | 32(25%) | | |
| Total | 160(41.7%) | | |

Most of the lameness was diagnosed in forelimb (50%) followed by both forelimb and hind limbs (41.7%) and hind limb (8.3%).This difference was statistically significant (p<0.05) (table 4).

Table 4:Site of lameness: forelimb, hindlimb and both limbs

| Towns | Forelimb | hind limb | Both fore and hind limbs | Total |
|--------|-----------|-----------|--------------------------|-------|
| Asella | 144(60%) | 16(6.7%) | 80(33.3%) | 240 |
| Robe | 48(33.3%) | 16(11.1%) | 80(55.6%) | 144 |
| Total | 192(50%) | 32(8.3%) | 160(41.7%) | 384 |

Table 5: Due to mismanagements of carthorses by the owners the following risk factors were contributed for lameness

| Variables | Frequencies | Percents |
|------------------------------|-------------|----------|
| Housing system | | |
| In house | 192 | 50 |
| Open house | 192 | 50 |
| Floor of house | 144 | 37.5 |
| Simple ground | | |
| Leveled with stone | 240 | 62.5 |
| Presence of lameness | 160 | 41.7 |
| Transportation | 48 | 12.5 |
| Only for humans | | |
| Both for human and goods | 336 | 87.5 |
| Foot inspection | 32 | 8.3 |
| No inspection | | |
| When it gets lame | 112 | 29.2 |
| Immediately of Work | 240 | 62.5 |
| Number of people transported | | |
| Less than two | 208 | 54.2 |
| Greater than two | 176 | 45.8 |
| Average weight load | 256 | 66.7 |
| Less than 200KG | | |
| Greater than 200KG | 128 | 33.3 |
| Shoeing materials | 48 | 12.5 |
| No shoeing | | |
| Rubber | 240 | 62.5 |
| Iron with rubber | 64 | 16.7 |

Discussion

Results from this study indicate that lame was a common problem in cart horses in the study areas. The overall prevalence of lameness was 30.5 percent. This finding was lower than the report of Moti(2005) who reported 67.9%(n=243) in Debrezeit, Modjo, Akaki and Debre Brehan. This

difference could be due to change in awareness of owners of cart horse in study area.

In this study the prevalence of lameness was 32.5% in Asella and 27.1% in Robe carthorses. Even though there was no statistically significance difference ($p>.05$) on the lameness prevalence between two towns, there was significant difference in General anatomical site associated ($p<.05$).

Hoof associated problems was highest in Asella town (42.9%). This might be associated with the difference in the nature of working ground surface. Fetlock, carpus and hock joint associated problems were highest in Robe town (33.3%) and this could be attributed to overloading and stressful activities from environment and the use of cargo or heavy carts. And also elbow, stifle and muscle associated problems were the highest in Robe town (33.3%). This might be due to shoeing practice adopted. They use only rubber shoes which are easy to wear off and may cause mediolateral and anteroposterior hoof imbalance as a result which tendon strain and joint stress might result. 60% of lameness was diagnosed on the distal limb (distal to carpus and tarsus). This might be associated with the anatomical exposure of the distal limb to different external factors like thrush and nail puncture. Rose and Hodgson (1993) had reported that most lameness of equids occurs on the distal limbs and examination should concentrate on this part of animals.

The study also indicated that 50% of lame animals were basically due to forelimb. The forelimbs bear 60-65% of weight of the horse. This means the forelimbs are subjected to the more injuries from concussion and trauma than the hindlimbs. The forelimbs are not only major weight bearers of the body in movement but also support the hind limbs in propelling the body (Adams, 1987).

Questionary survey conducted in both study towns indicated that carthorses were utilized for transportation people and loading of goods. Usually two horses pull a cart at different times with harness in shift. One horse during morning hours and the other in the afternoon, this can decrease load of work in horses. The overall prevalence of lameness according to the cart horse owners was 117(30.5%). Indicated that some lame horses of some owners were working while the other horses were seeking veterinary services in the clinic. Most of the owners keep their horses in open housing. This could cause muddy environment during rainy season that might soften the hoof and make it prone to thrush, injury and

nail puncture. Most of the respondents were aware of the lameness signs and brought their horses for treatment even at the lowest grades. This was of a great help for treatment. The affected horses and provision of better prognosis

Conclusion and Recommendations

This study presents: causes, prevalence and risk factors associated lameness in cart horses of Asella and Robe towns by using physical clinical examination and Questionary survey. Lameness of different severity has been diagnosed which caused decrease in productivity and loss of function of animals. According to the cross-sectional study the main cause of lameness was hoof associated problems and forelimb is more affected than hindlimbs. The overall prevalence of lameness of the two towns was 30.5%. Although, the contribution of rough and abrasive working surface is undeniable causes of lameness is mainly attributed to mismanagement of owners. Most carthorses lack proper housing, ground, regular hoof care and skilled farrier to trim hooves and fit their shoe properly.

Based on the above findings the following recommendations are forwarded.

- Carthorse owners should develop a habit of visiting skilled farrier on regular basis.
- Improve the skill of local farriers through provision of education on the area of hoof anatomy and use of proper instruments with proper technique.
- Increase the owners' awareness about the management of carthorses.

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