Study On The Impact Of Harness In The Control Of Back Sore Of Donkeys In And Around Gondar Town

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Abstract: Across sectional study was conducted from November, 2018 to March 2019 on randomly selected working donkeys to assess the impact of harness in the control of back sore of donkeys in and around Gondar town (Azezo and Loza Mariyam). A total of 384 donkeys were examined. From this 67 donkeys were wounded. The overall prevalence of wound was 17.45%. Wounded donkeys with respect to age of young, adult and old animals have the prevalence of 11.9%, 18.52% and 15.56% respectively. From this result adults have the highest whereas young donkeys have the lowest prevalence. According to the sex Males and females have the prevalence of 17.18% and 17.65% respectively have wounds. From them females are slightly more affected than males. Wounded animals respecting to body condition score poor, medium and good body conditioned have the prevalence of 15.12%, 19.65% and 13.04% respectively. From this finding medium body conditioned donkeys have the highest prevalence when we compared to others. According to the origin of wounded animals Azezo and Loza Mariyam kebeles have the prevalence of 14.52% and 22.79% respectively. From this result Loza Mariam kebeles has the higher prevalence of wounded donkeys than Azezo kebeles. The prevalence of wounded donkeys with respect to fertilizer sac only, fertilizer sac + straw, leather, blanket and no padding is 40%, 11.33%, 24.32%, 29.79% and 29.17. From this finding pack saddle used donkeys with leather and no paddling donkeys have the highest prevalence next to pack saddle used the fertilizer sac only.

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1. Introduction

Ethiopia has a large numbers of equines. It has a total of 9.83 millions equine populations. From those numbers, donkeys accounts 7.04 million while horses and mules are 2.03 and 0.4 million respectively [1]. Equines have a prominent position in the agricultural systems of many developing countries. In Ethiopia, the low level of development of the road transport network and the rough terrain of the country make the donkeys and the horses the most valuable, appropriate and affordable pack animals under the small holder farming system [2].

In Ethiopia more than half of the human population is dependent on the power provided by draft animals, 90 million of which are equines. With entire extended families often dependent on the working capacity of just one equine, human welfare and animal welfare are inextricably linked. Sadly, constraints such as poverty and lack of knowledge mean that animal welfare is being compromised internationally [3].

Equines play an important role as working animals in many parts of the world, employed for packing, riding, carting and ploughing. Equine power is vital for both rural and urban transport system which is cheap and provides the best alternatives in places where the road network is insufficiently developed and in the cities where narrow streets prevent easy delivery of merchandise. It is suggested that donkeys can play a great role in the frame works of food security and social equity of high food insecure countries [4].

In areas away from roads, many people use mules and donkeys to transport food and other supplies to villages. Long working hours and difficult conditions are experienced by donkeys and mules. These animals are often engaged in work for long hours and when get free, they are left to browse and feed on garbage. These have the potential to affect negatively on their welfare of life and health [5].

People in most peri-urban centers either own or rent horses, mules or donkeys to transport goods, people and even water. Despite their use, the husbandry practices of working equines are poor. Some hobbling methods cause discomfort and inflict wounds. In addition, inappropriate harnesses or yokes that may be heavy and ragged, long working hours and insufficient food, have a negative effect on the animals' health and welfare [6]. Harness development has long been identified and acknowledged as a problem area and one of significance in which little progress has been made. Owners, through necessity and without the skills and expertise required for successful harness manufacture, are left to their own devices in creating what they believe to be suitable harness using inappropriate materials [7].

Most harness related injuries are avoidable. It is estimated that 70% of veterinary intervention in developing countries is in dealing with the symptoms of harness related injuries. The productivity of working equines can be vastly improved by the use of harness that is strong, comfortable and allows freedom of movement without the risk of injury. The donkey sanctuary measures, the effect of these problems or gaps on the donkey itself by using animal based welfare assessment tool with BCS, wound, lameness, behavior and other illnesses as the main indicators. It is hoped that in having a better understanding of draught animal harness and its function, many of the injuries endured by working animals could be alleviated [7].

Wound is an open mechanical injury of the skin (epidermis), underlying tissues and organs. It is characterized by pain, gaping, bleeding and functional disturbance [8]. The type of wound in working donkeys includes tissue damage with or without blood/exudates/ pus, abscess formation, or any secondary bacterial complication. Bites (lacerated wounds) will be identified by irregular edges with underlying tissues removed as well as hemorrhage [3].

Therefore, the current study was focused on assessment on the impact of improved harness in the control of back sore of donkeys in Gondar city as well as associated risk factors. Therefore the objectives of this study were:

- ✓ To study the prevalence of back sore and its associated risk factors in donkeys.
- ✓ To assess pack saddle use in donkeys

2. Materials And Methods

2.1. Study Area

The study was conducted from November, 2018 to March 2019 on randomly selected working donkeys in Gondar town. Gondar is a city which is located in the Semien Gondar zone of the Amhara Region. It is north of Lake Tana on the lesser Angereb River and south west of the Semien Mountains. It has a latitude and longitude of 12°36'N 37°28'E/ 12.600°N 37.467 ° E with an elevation of 2133 meters above sea level. Gondar served as a strong Christian kingdom for many years. Fasil Castle and Debre Birhan Selassie church are the UNESCO recorded historical place found in Gondar [9].

2.2. Study Animals

The study has considered randomly selected donkeys irrespective of age, sex and body condition score investigate the prevalence of back sore in relation to improved pack saddle and associated risk factors. Donkeys play a major role in transportation sector in carrying water, harvested crops, and flours from grinding mill and any goods from and to markets.

2.3. Study Design and Methodology

A cross sectional study has been conducted to determine the impact of improved harness in the control of back sore in donkeys and associated risk factors.

2.3.1. Sample size determination and sampling technique

A total of 384 donkeys have been sampled randomly for physical examination from selected kebeles (Azezo and Loza Mariyam) especially those which are present at the kebeles' main market and grind mill houses as well as vet clinics. The sample size has been determined according to the formula given by Thrusfield [10].

2.3.2. Physical examination

Each randomly selected donkey has been physically examined for any external body injury, and findings including site, severity and class of wound have been recorded on a structured body mapping and physical examination sheet. Age and body condition score estimations have been made according to the method described by Sevendsen [11]. Wound severity and classification estimation also made as indicated by Biffa and Woldemeskel [12] and Knottenbelt [13] respectively.

2.3.3. Questionnaire Survey

In addition to the direct physical examination each randomly selected donkey owner has been interviewed with a semi-structure interview (having both open and close questions) to extrapolate information regarding owner's general information, donkey management practice (harnessing, feeding, housing, health care), working nature (duration of work, weight carried, length of journey covered, nature of working environment) and donkey-owner relationship.

2.4. Data analysis and presentation

Data both from the direct physical examination and questionnaire were properly coded and entered into Microsoft Excel-2007 spread sheet. The data was filtered for any invalid entry and then transferred to SPSS 16.0 version for windows package (2007) for statistical analysis. Descriptive statistics was made and differences (associations) in the prevalence of wound within each risk factor (independent variable) have been tested for significance through Pearson's Chi-square analysis at a probability level of 0.05. Results of the analysis are presented through illustrative figures and tables.

3. Result

Descriptive statistic for site, sex, age and body condition score of the sampled donkeys is illustrated in table 1 below.

Table 1. Descriptive statistics for site, sex, age and body condition score of physically examined donkeys.

Variable		Frequency (n)	Percentage (%)
Age	Young (<2yrs)	42	10.94
	Adult (2-10yrs)	297	77.34
	Old (>10yrs)	45	11.72
Sex	Male	163	42.45
	Female	221	57.55
Body Condition Score	Poor	86	22.40
	Medium	229	59.64
	Good	69	18.00
Origin	Azezo	248	64.58
	Loza Mariam	136	35.42

As the table 1 shows that according to age adult, old and young donkeys has the prevalence of 77.34%, 11.72% and 10.94% respectively. From this result adult donkey has the highest prevalence when we compare from young and old. Within relation to sex female and male has the prevalence of 57.55% and 42.45% respectively. From the sex female has higher prevalence. According to body condition score poor, medium and good body conditioned animals has the prevalence of 22.40%, 59.64% and 18% respectively. From this result medium body conditioned donkey has the highest prevalence. When we compare regarding to the origin of animals Azezo (64.58%) has the highest prevalence than Loza Mariyam (35.42%).

The overall prevalence of wound was 17.45% (n=67) from the 384 examined donkeys. The overall prevalence of no wound donkeys was 82.55% (n=317). Figure (1) below illustrates distribution of wounds on the body of examined donkeys.

Table 2. Over all prevalence of wound

Status Of animals	Frequency	Prevalence (%)
Wounded	67	17.45%
No-Wounded	317	82.55%
Total	**384**	**100%**

Table 3. Wound prevalence and signs of illnesses

Sign of illness	Examined donkeys	Wounded Donkeys	Prevalence (%)
signs of illness	159	49	12.8%
No sign of illness	225	18	4.7%
Total	**384**	**67**	**17.5%**

According signs of illness and no sign of illness in wounded donkey has the prevalence of 12.8% and 4.7% respectively. This finding shows that wounded donkeys with signs of illness has the higher prevalence.

Table 4. Wound prevalence among age, sex, BCS and site categories.

Variable		Examined Donkeys (n)	Wounded Donkeys (n)	Percentage (%)
Age	Young (<2yrs)	42	5	11.9 (%)
	Adult (2-10yrs)	297	55	18.52 (%)
	Old (>10yrs)	45	7	15.56 (%)
Sex	Male	163	28	17.18 (%)
	Female	221	39	17.65 (%)
Body Condition Score	Poor	86	13	15.12 (%)
	Medium	229	45	19.65 (%)
	Good	69	9	13.04 (%)
Origin	Azezo	248	36	14.52 (%)
	Loza Mariam	136	31	22.79 (%)

Wounded donkeys with respect to age of young, adult and old animals have the prevalence of 11.9%, 18.52% and 15.56% respectively. From this result adults have the highest whereas young donkeys have

the lowest prevalence. According to the sex Males and females have the prevalence of 17.18% and 17.65% respectively have wounds. From them females are slightly more affected than males. Wounded animals respecting to body condition score poor, medium and good body conditioned have the prevalence of 15.12%, 19.65% and 13.04% respectively. From this finding medium body conditioned donkeys have the highest prevalence when we compared to others. According to the origin of wounded animals Azezo and Loza Mariyam kebeles have the prevalence of 14.52% and 22.79% respectively. From this result Loza Mariam kebeles has the higher prevalence of wounded donkeys than Azezo kebeles.

Table 5. Sufficiency of pack saddle/padding use in back sore prevalence

Pack saddle/pad Used	Examined donkeys (n)	Wounded donkeys (n)	Percentage (%)
Fertilizer sac only	20	8	40%
Fertilizer sac + Straw	256	29	11.33%
Leather	37	9	24.32%
Blanket	47	14	29.79%
No padding	24	7	29.17%

The prevalence of wounded donkeys with respect to fertilizer sac only, fertilizer sac + straw, leather, blanket and no padding is 40%, 11.33%, 24.32%, 29.79% and 29.17. From this finding pack saddle used donkeys with leather and no paddling donkeys have the highest prevalence next to pack saddle used the fertilizer sac only.

4. Discussion

By this the study confirmed that the prevalence, severity and risk factors of back sore in working donkeys. The distribution of wound on examined working donkeys was mostly on the back area due to harnessing, on the neck area due to donkey bite and thigh area due to hyena bite. This might be due to poorly designed and ill fitted saddles manufactured by unskilled artisans or donkey owners. Tesfaye and Curran [14] in Central Ethiopia and Biffa and Woldemeskel [15] in South Ethiopia reported the same result. But the report done by Sells [16] in Morocco wound distribution mostly was on the withers, this difference might be due to the different design in saddle and strap. Based on this research the prevalence of wound in working donkeys was 17.45%. This finding was markedly lower than the reported 54% in Morocco [16], 59% in Jordan [17], and 79.4% Biffa and Woldemeskel, [15] in Ethiopia. This lower result was due to management system of the community with giving higher rest and application of improved Pack saddle. Prevalence of wound had also depend on the design of the saddle, that the back sore has higher difference in donkeys used with padding having a uniform design compared to partitioned one. Based on the research wound prevalence had a significant difference with site of the two kebeles, Azezo 14.52 %, and Loza Mariyam 22.79%. Wound prevalence with the age categories, in which adults are the most affected age group 18.52%, while old aged donkeys wounded with 15.56% and youths with 11.9%. Similarly Girma [3] reported 22.9% of wound in young, 42.2% in adults and 46.3% in old donkeys. Similar scenarios were reported by Biffa and Woldemeskel [15]. This might be due to the fact that adults were involved in a wide range of activities. But wound did not show any significant difference with the sex and BCS categories.

In conclusion Wound can affect the health condition, productivity and performance of animals. Pack saddle is largely responsible for this problem. So it is important to take care and prevent any wound caused by improper fitting or insufficient use of harness. The efficient use of working animals depends on how they are connected to the implement they are pulling or the materials they are carrying and how well they have been trained and managed. Based on the above conclusion the following recommendations were forwarded:

- ✓ Pack saddles should always be free from any injuring thorns.
- ✓ Replace poorly designed or old harness with a new one.
- ✓ Working animals should not be loaded beyond their capacity and while they are with ill signs.
- ✓ Wounded animals should be treated from vet clinics.
- ✓ Regular awareness creations to donkey owners on proper management and handling of donkeys should be in place.

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