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Prevalence of Wounds and Associated Risk Factors in Working Equines in Jimma Town of Oromia Region, South-Western Ethiopia

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Abstract: A cross sectional study was carried out between October, 2016 and January, 2017 with the objectives of determining the prevalence of wounds and associated risk factors in working equines in Jimma town, Southwestern Ethiopia. Both direct (animal based) and indirect (owner interview) assessment methods were used. Out of the total 470 examined equines (299 horses and 171 donkeys) the overall wound prevalence was 61.9%. Significant difference was observed in the occurrence of wound between species ($P<0.05$) and it is higher in horses (68.2%) than in donkeys (50.9%). There was no statistical significant variation ($P>0.05$) in the occurrence of wound among age groups. Severity of wound was not associated with species ($P>0.05$) but it is relatively severe (32.8%) in horses than donkeys (27.6%). Wound caused by improper harness and saddle were higher ($P<0.05$) in both horses (62.7%) and donkeys (50.6%). Significant proportion of horses (61.3% and donkeys (82.8%) didn't receive any treatment from their owner ($P<0.05$). There was no significant variation ($P>0.05$) in type of wound among both species, whereas abrasion type of wound in horse (77%) and in donkeys (72.4%) was the highest type of wound in both species. There was significant difference ($P<0.05$) in location of wound in different body parts among species, whereas prescapular area the body was highly affected in both species (57.4% in horses and 36.8% in donkey). There was significant variation ($P<0.05$) in fate of injured animals where 76% of horses and 89.7% of donkeys used for work continuously regardless of the presence of wound. A collaborative effort to improve health and welfare of equine is recommended to overcome the problem.

Key words: Cross Sectional · Harness · Location · Saddle · Severity

INTRODUCTION

More than half of the world's population depends on animal power as its main energy source [1] . Livestock serve many purposes, including traction and transport, particularly in developing countries. Draught animals play an important role in agricultural production and transport sectors in sub- Saharan Africa in general and Ethiopia in particular [2] . An estimated 110 million equines live in the developing world [3] , where they are used for transport (pulling a cart or as pack animals), under saddle (particularly where roads are underdeveloped and/or the terrain is rugged and mountainous) and for ploughing [4-6].

Ethiopia holds large potential for equine production. They are found .mainly in temperate, semi-arid or highland areas. Ethiopia has approximately 6.21million donkeys, which is 32% of Africa's and 10% of the world's donkey population and 2 million horses which is 33.5% of Africa population [7]. However, the use and management of equines in Ethiopia is merely of traditional and probably is the least exploited.

Deficiencies in owner knowledge regarding topics such as wound management, watering and nutrition requirements, appropriate shelter arrangements and/or access to essential resources such as hard feed, grazing land or veterinary services have been highlighted in developing countries in Africa, the Middle East and Central Asia [8-11]. Moreover, the increasing human population in Ethiopia has resulted in an increase in demands of equines for transport of goods to and from far, remote areas and construction activities [12].

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Studies reporting on working equines' health are often specific to infectious and parasitic diseases and little attention is given for prevalence of wound. Therefore, this study was aimed to determine the prevalence of wound and associated risk factors in working equines in Jimma town, Southwest Ethiopia.

MATERIALS AND METHODS

Study Area: The study was conducted from October, 2016 to January, 2017 at Jimma town, which is located at about 352km 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 1530mm. The mean annual maximum and minimum temperature ranges from 25°C-30°C and7°C-12°C, respectively (Office of planning and economic development for Jimma zone, 2002). According to the statistical data obtained [13], Jimma zone has a livestock population of 2, 016, 823 cattle, 288, 411goats, 942, 908 sheep and 74574 horses, 49, 489donkey, 28, 371 mules and 1, 139, 735 poultry.

Study Animals and Design: Cross sectional study was conducted on 470 randomly selected, male working horses (299) and donkeys (171) found in Jimma town, southwestern Ethiopia.

Sample Size Determination: To determine the sample size, the expected prevalence in the study area was assumed to be 50% at 95% confidence interval because of absence of previous study on the prevalence of wound in the area. Therefore, the sample size was calculated based on the formula given by Thrusfiled [14], which will be 384 but to increase precession 470 of equines were sampled.

Study Methodology: Animals were examined physically for the presence of wounds; the results were recorded according to the sites of wound. Intensity of wound were classified according to Biffa and Woldemeskel [15], who classified as severe when there was ulceration involving a pronounced contusion in wide areas, tissue hypertrophy and sever complication. Moderate injuries were involving coalition of small wound with tissue sloughing involving no complication and hypertrophy and some with chronic courses. Wounds were categorized as mild when they involve only loss of epidermis and superficial layers with no further trauma. Wounds (injuries) were also classified as abrasion, lacerative, incision and puncture [16], whereas age of the equines was determined by asking the owner and the dentition characteristics [17] and categorized as young (<7 years) and old (≥7 years). In addition, semi-structured questionnaire was also used to gather data, such as species, age and cause of injury, harnessing type, management of animals and fate of injured animals.

Data Analysis: Data obtained from the study was analyzed using SPSS version 20.0. Prevalence of wound was determined as the proportion of injured animals out of the total examined. Association and risk of factors relating to occurrence of wound was investigated using chi-square test. Odds ratio (OR) was calculated to assess the risk levels of category under each risk factor. The significance of OR was determined by constructing a 95% confidence interval (CI).

RESULTS

From totally examined 299 horses and 171 donkeys, 291 of them have wound on their body which gives 61.9% of the total prevalence. Species was observed to significantly influence the prevalence of wound ($P<0.05$), higher prevalence was observed in horses 68.2% than in donkeys (50.9%). There was no statistical significant variation ($P>0.05$) in the occurrence of wound between age groups. Old animals have the same probability of having wound to young animals. But the prevalence in old animals (62%) is slightly higher than young (61.7%) (Table 1).

Wound caused by improper harness and saddle were significantly higher in horses (62.7%) and donkeys (50.6%) than other causes ($P<0.05$). Overloading and overworking in donkey (28.7%) and diseases in horses (13.2%) were the next leading causes of wound (Figure 1). There was no statistical significant variation ($P>0.05$) in type of wound in both species. But abrasion type of wound is higher in horses (77%) and donkeys (72.4%) followed by lacerative type 14.7% in horses and 18.4% in donkeys (Figure 2).

The severity of wound was not significantly varies in both species. But moderate type of wound was relatively higher in both horses (39.7%) and donkey (42.5%) (Table 2).

Location of wound on body part showed significant variation ($P<0.05$). Wound in prescapular area (51.2%) was significantly higher than other body parts from the total animals. For species, wounds were frequently observed in prescapular area (horses=57.4% and donkey=36.8%) and back (horses=10.8% and donkey=25.3%) compared with other parts (Table 3).

Table 1: Prevalence of wound based on different age andspecies of equines

Risk factors	Groups	No. of examined	Prevalence (%)	OR (95% CI)	P-value
Species	Horse	299	204 (68.2%)	2 (1.4-3.05)	0.001
	Donkey	171	87 (50.9%)	1	
	Total	470	291(61.9%)		
Age	Young	167	103 (61.7%)	1	
	Old	303	188 (62%)	0.984(0.66-1.45)	0.937
	Total	470	291 (61.9)		

Table 2: Severity of wound by species of equines

	Severity			
Species	Sever	Moderate	Mild	Total
Horse	67 (32.8%)	81 (39.7%)	56 (27.5%)	204 (68.2%)
Donkey	24 (27.6%)	37 (42.5%)	26 (29.9%)	87 (50.9%)
Total	91 (31.3%)	118 (40.5%)	82 (28.2%)	291 (100%)

$\chi^2 = 0.787$, *P>0.05*

Table 3: Location of wound on different parts of the body

	Species		
Location of wound	Horse	Donkey	Total
Head	3 (1.0%)	0(0.0%)	3 (1.0%)
Neck	4 (1.4%)	1 (0.3%)	5 (1.7%)
Shoulder	21 (7.2%)	9 (3.1%)	30 (10.3%)
pre scapular	117 (40.2%)	32 (11.0%)	149 (51.2%)
Front limb	10 (3.4%)	4 (1.4%)	14 (4.8%)
Chest	2 (0.7%)	3 (1.0%)	5 (1.7%)
Back	22 (7.6%)	22 (7.6%)	44 (15.1%)
Abdomen	1 (0.3%)	1 (0.3%)	2 (0.7%)
Hind limb	5 (1.7%)	8 (2.7%)	13 (4.5%)
Mixed	19 (6.5%)	7 (2.4%)	26 (8.9%)
Total	204 (70.1%)	87(29.9%)	291 (100.0%)

÷2 = 23.917, *P<0.05*

Table 4: Owners' Responses to the Management of External Injuries

	Species		
Management of wound	Horse	Donkey	Total
Take to nearby health center	49 (16.8%)	5 (1.7%)	54 (18.6%)
Treat with medications purchased from local market	2 (0.7%)	0 (0 %)	2 (0.7%)
Take to local healer	6 (2.1%)	4(1.4%)	10 (3.4%)
Treat with medicinal plants	2 (0.7%)	2 (0.7%)	4 (1.4%)
Use burned oil	20 (6.9%)	4 (1.4%)	24 (8.2%)
Do nothing	125 (43%)	72 (24.7%)	197 (67.7%)
Total	204 (70.1%)	87 (29.9%)	291 (100 %)

$\chi^2 = 19.248$, *P<0.05*

Table 5: Fate of injured animals

	Fate of injured horse				
Species	Used regardless of the presence of wound	Given long-term rest	Given short-term rest	Left on the road to survive on their own	Total
Horses	155 (53.3%)	12 (4.1%)	34 (11.7%)	3 (1.0%)	204 (70.1%)
Donkeys	78 (26.8%)	0 (0.0%)	5 (1.7%)	4 (1.4%)	87 (29.9%)
Total	233 (80.1%)	12 (4.1%)	39 (13.4%)	7 (2.4%)	291 (100%)

$\chi^2 = 14.448$, P<0.05

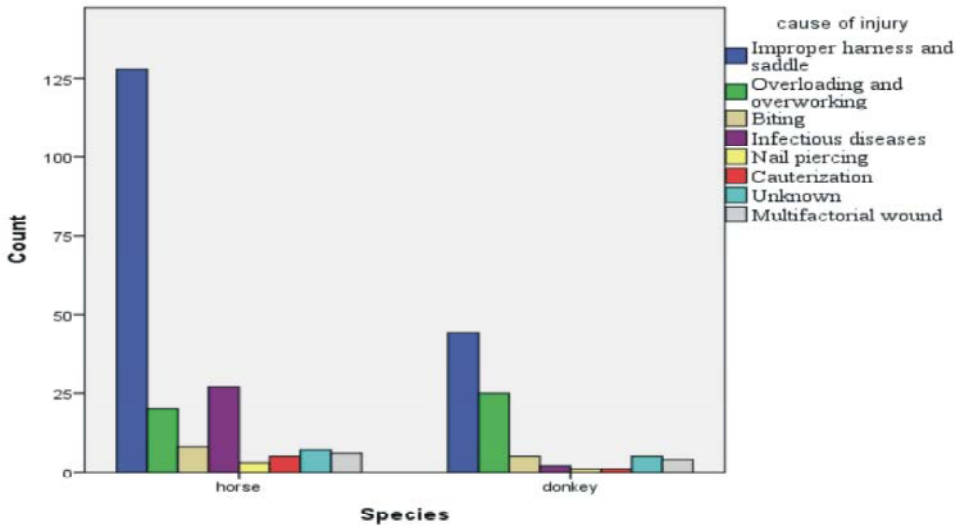

Fig. 1: Cause of wound within species of equines

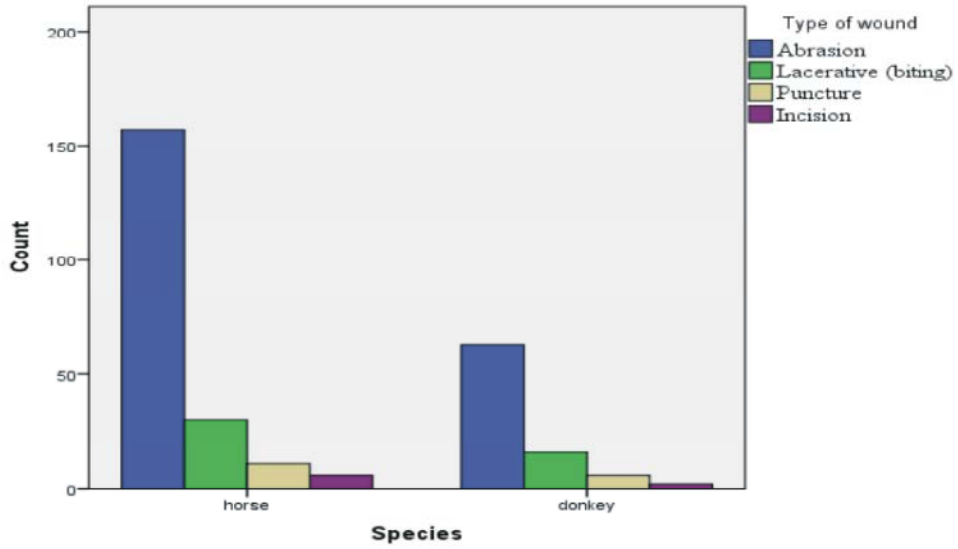

Fig. 2: Types of wound by species

Fig. 3: Lacerative wound caused by biting of hyena and complicated with maggot

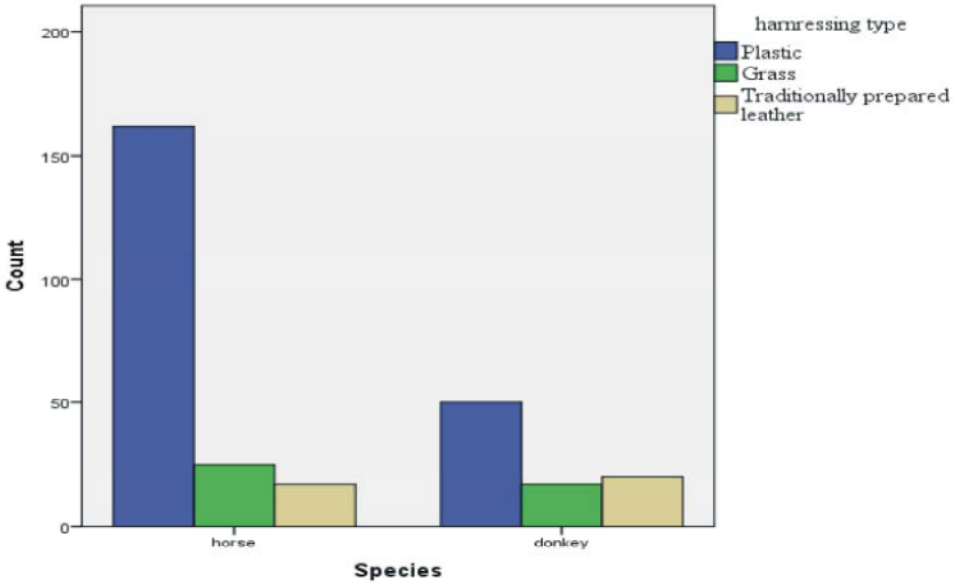

Fig. 4: Types of Harnessing

Fig. 5: A horse left on the road to survive by its own due to Epizootic lymphangitis

Harnessing type showed highly significant variation in the occurrence of wound among species (P<0.05) in which horses (79.4%) and donkeys (57.5%) of the owners use plastic (Figure 4).

A significant number (P<0.05) of donkeys (82.8%) and horses (61.3%) didn't receive any treatment from their owner than a small number of horses (24%) and donkey (5.7%) who receive veterinary service. None of donkey owners treat their animal with medications purchased from local market (Table 4).

Significantly large proportion of donkey owners (89.7%) and horse owners (76%) responded that they used their animals in the presence of wound while few responders (5.7% and 16.7%) give short term rest, respectively. None of donkey owners gave long term rest for their animal (Table 5).

DISCUSSION

In the current study, prevalence of wound was high (61.9%) in horses and donkeys, which is comparable to finding of Fikiru *et al*. [18] in Kombolcha town, northern Ethiopia with prevalence 64% and lower than the finding of Biffa and Woldemeskel [12] who reported 72.15% prevalence in Hawassa, southern Ethiopia and higher than that of the 44% prevalence report from the central Ethiopia [19], which may be due to husbandry and management differences.

The prevalence rate of wound in old animals is slightly higher than in young animals, which is in contrary with finding of Biffa and Woldemeskel [12] but comparable with the finding of Sisay [20] in Mekelle, northern Ethiopia.

Higher number of abrasion wound was found in both species, which also reported in Hawassa, southern Ethiopia [12] and Kombolcha town, northern Ethiopia [18] . Improper harness and saddle was the leading cause of wound in equines which is similar with the findings in Kombolcha town, northern Ethiopia [18] and in Hawassa, southern Ethiopia. Infectious diseases in horses (13.2%)

commonly epizootic lymphangitis and overloading and overworking in donkeys (28.7%) was the second leading causes of wound Night resting was attributed to the occurrence of biting by hyenas in both species. Regarding the location of wound, it mainly occurred in prescapula area, back and shoulder related to harnessing type and design. Saddle made from wood or iron frequently put on back or shoulder and tightly tied in the body by plastic rope which causes irritation and wound. In most areas, harness is made by hard plastic stripes which can inflict wound [12].

Most of the equines (61.3% horses and 82.8% donkeys) didn't receive any treatment from their owners. This situation is similar to the report in Hawassa, southern Ethiopia [12] and Kombolcha town, northern Ethiopia [18] .Few owners (18.6%) provide veterinary service for their animal. 8.2% of the owners treated their animal with burned oil which may increase the severity of the wound. Most of the owners (80.1%) use their animals continuously regardless of the presence of wound which may aggravate the wound. Once the animal is unable to work, it will be left on the road to survive on its own. These are the common welfare problems in working equines in Ethiopia.

CONCLUSION

The study showed higher prevalence of wound in working equines in Jimma town, southwestern Ethiopia. The major causes of wound were improper harness and saddle, infectious diseases and overloading and overworking. Most of the owners didn't give veterinary service for their animal and use continuously regardless of the presence of wound. A collaborative effort to improve equine health and welfare is recommended to overcome the problem.

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