Received: 18 July 2023, Accepted: 12 September 2023

Original Research

Journal of Advanced Veterinary Research
(2023) Volume 13, Issue 8, 1664-1667

Prevalence of Equine Wounds and Associated Risk Factors in Different Agro-ecological zones of Lesotho

Paseka P. Kompi*, Setsumi Molapo, Khahliso A. Mosebo

Department of Animal Science, Faculty of Agriculture, National University of Lesotho, Roma, Lesotho.

***Correspondence**
Corresponding author: Paseka P. Kompi
E-mail address: pasekakompi3@gmail.com

Abstract

The contribution of equines in sustaining the livelihoods of many people, particularly in developing countries is evident. However, their socioeconomic importance is often overlooked and consequently they are given poor husbandry practices which substantially threaten their welfare. The occurrence of wounds is among other health threads which stem from such poor practices. A cross-sectional study was undertaken on 420 randomly selected equines from September to December 2022 with the objective to determine the prevalence of equine wounds and identifying influencing factors associated with the prevalence. Binary logistic regression was used for determining the prevalence of wounds in different parameters. Odds ratios (OR) were used to determine the degree of association between the different risk factors and the wound. The overall prevalence of equine wound was 39.0% from which 53.5% and 23.9% of wound prevalence were detected in horses and donkeys, respectively. The prevalence of wound differed significantly between different sex groups where males (50.7%) were highly affected than females (26.6%). The agro-ecological zone was found to have a significant influence on the occurrence of wounds where equines in the mountains and the foothills (46.6%) and (44.9%) respectively had higher record than those in the lowlands (26.9%). The distribution of wounds differed significantly between different body regions and more records were obtained at the back (50.0%) and the least on the legs (11.6%). The observed wound categories differed significantly, and more records were on abrasion (40.9%) and the least on incision (9.1%). It is concluded that wounds represent serious welfare problem in equines in the study area.

KEYWORDS
Donkeys, Horses, Lesotho, Prevalence, Wounds.

INTRODUCTION

The significance of equines in sustaining the livelihoods of people in both urban and rural areas of developing countries is evident (Getachew *et al*., 2014). Equines are involved in various vital daily activities. Given the context of Lesotho, equines are used mainly as a source of transport particularly in remote areas of the country due to scarcity of road infrastructure (Kompi *et al*., 2021). The use of equines for transport is also because of the prevailing low economic status of rural people. The contribution of equines in agricultural activities like transportation of agricultural products from the fields to homes is very significant (Teferi *et al*., 2020). Mekuriaw (2019) reiterated that the use of horses in pulling the cards to transport people and materials such as water, crop, vegetable, construction materials, firewood and other goods to market is very common in both urban and rural areas. Equines can provide both direct and indirect income generation hence without them life would be very difficult for some owners who solely rely on them for their subsistence.

It is an undeniable fact that the attention that is given to equines relative to other livestock species in the country is far less than what they deserve. There are limited initiatives like scientific investigations done to explore the health aspect of equines worldwide. This biasness has also been confirmed by Mekuria and Tesfaye (2016) in Southern Ethiopia who articulated that much of healthcare services are directed towards cattle than equines. Despite the unfolding significance of equines, their efficiency in production and reproduction is hampered by several health issues among which the prevalence of wounds seems to be a persistent health thread. Teferi *et al*. (2020) in Ethiopia reiterated that the prevalence of wounds in equines is a common health concern which compromise their welfare, reduce their work efficiency and predispose them to second infections. Similarly, Getachew *et al*. (2010) and Behnke and Metaferia (2011) confirmed that wounds represent a common health thread for equines worldwide. Several authors have confirmed that among other health threads confronting equines, wounds remain the most common of all (Curran *et al*., 2005; Burn *et al*., 2007; Sells *et al*., 2010).

According to Dinka *et al*. (2006) the prevalence of wounds on equines is mostly caused by certain methods of hobbling to restrain equines. On the other hand, Mekuria and Tesfaye (2016) noted that the occurrence of wounds on equines is due to loading with minimal use of padding as well as overloading for a long distance. Asfaw *et al*. (2012) indicated that the possible causes of wounds in equines include punctures from sharp object like metal and glass; shear wounds from barbed wire sticks; collusion injuries from falling or running in to the object and entrapment,

ISSN: 2090-6277/2090-6269/

such as getting a leg hung up in a rope. Gizachew *et al*. (2013) noted that wounds on working equines are frequently observed on the leg, girth, tail, saddle and wither regions. According to Tesfaye and Mekuria (2017) these wounds can be attributable to a combination of several factors including poorly fitting and designed tack or harnesses, beating with sticks and improper management practices. Asfaw *et al*. (2012) articulated that one of the potential ways in which wounds can be decreased is through education to equine owners and users.

In most cases studies are undertaken on the prevalence of infectious diseases on equines however external injuries are often overlooked. Understanding the status of equine wounds and possible risk factors associated with the prevalence is fundamental for the implementation of management practices aimed at preventing wounds on equines. The current study was therefore conducted to determine the prevalence of wounds in working equines and to identify influencing factors associated with the prevalence.

MATERIALS AND METHODS

Description of the study side

The study was conducted in Maseru district Lesotho from which three distinctive agro-ecological zones namely the lowlands, foothills and mountains were selected for sampling. The lowlands were represented by Rothe and Morija, the foothills by Ha-ntsi and the mountains by Semonkong.

Study animals

The study animals were working horses and donkeys reared in the community and mostly were kept under a semi-intensive production system.

Study design and sampling

A cross-sectional study was conducted on 420 randomly selected horses (215) and donkeys (205) from September to December 2022. Given the fact that there are no previous studies in the study area on equine wounds, 50% expected prevalence was considered to establish the sample size with 95% confidence level and 5% absolute precision. The formula suggested by Thrusfield (2005) was used to calculate the required number of animals.

$n=1.96^2 Pexp(1-Pexp)/d^2$

Where n= the required sample size; 1.96 is the value of z at 95% confidence level; Pexp=expected prevalence of wounds; d= desired absolute precision level at 95% confidence level. Using this formula, the required sample size for the current study was 384 however to increase precision 420 equines were included in the study.

Data collection

A physical examination sheet was developed, and sex of an animal was considered when recording the data. The region where the wound was observed was also considered and accordingly regions were categorized into lips, underbelly, back and the legs. Wounds were categorized into incision, laceration, abrasion, and puncture.

Data analyses

SPSS version 20 was used for the analysis of the data whereby Binary logistic regression within general linear models was used for determining the prevalence of wounds in different specie groups, sex groups and agro-ecological zones. Odds ratios (OR) were used to determine the degree of association between the different risk factors and the wound. The differences in parameters like body region and wound category were analyzed by using X^2(chi- square) technique and the level of significance was set at $p<0.05$.

RESULTS

The results on the overall prevalence rate of wounds showed that out of 420 examined animals, 164 had wounds which make the overall prevalence of 39.0% for the whole study.

The prevalence of wounds between horses and donkeys is summarized in Table 1. Species was observed to significantly influence the prevalence of wounds ($p<0.05$), where higher prevalence was recorded in horses (53%) than in donkeys (24%). The results further showed that every one unit increase in horses is also predicting increasing likelihood associated with having wounds relative to donkeys by 3.66 times.

Table 1. The Prevalence of wounds between species categories.

Species	No. of Examined animals	Prevalence (%)	S.E.	Exp(B)
Horses	215	115(53.5^a)	0.21	3.66
Donkeys	205	49(23.9^b)	0.16	1

Percentages with different superscripts on the same column differ significantly, Exp (B) = Exponential beta, S.E standard error

Table 2 summarizes the prevalence of wounds in different sex groups. The results showed that there was a statistical significance variation ($p<0.05$) in the occurrence of wounds in different sex groups, males (51%) were highly affected than females (27%). The results further indicate that with increasing scores on males there is an increase in the likelihood of having wounds relative to females by 2.837 times.

Table 2. The prevalence of wounds in different sex groups.

Sex	No. of Examined animals	Prevalence (%)	S.E	Exp(B)
Male	217	110(50.7^a)	0.32	2.84
Female	203	54(26.6^b)	0.33	1

Percentages with different superscripts on the same column differ significantly, Exp (B) = Exponential beta, S.E standard error

The results presented in Table 3 summaries the prevalence of wounds in different agro-ecological zones. There was no statistically significant variation ($p>0.05$) in the prevalence of wounds between equines in the foothills (44.9%) and the mountains (46.6%) however the prevalence was relatively higher in the mountains than the foothills. The results further showed that the prevalence of wounds in the lowlands was significantly ($p<0.05$) lower than the prevalence rate in both the foothills and the mountains. When the mountains were taken as the reference point the predicted odds of having wounds moving from mountains to foothills decreased insignificantly ($p= 0.795$) by 0.93 times. The results however showed that the predicted odds of having wounds moving from the mountains to the lowlands decreased significantly ($p=0.001$) by 2.21 times.

Table 4 summarizes the prevalence of wounds in different body regions and the chi-square confirmed that the prevalence of wounds differed significantly ($p=0.00$) between different body regions where more wounds were recorded on the back (50.0%)

and the least on the legs (11.6%).

Table 3. The prevalence of wounds in different agro-ecological zones.

AEZ	No. of Examined animals	Prevalence (%)	S.E.	Exp(B)
Lowlands	145	39(26.9[a])	0.04	2.21
Foothills	187	84(44.9[b])	0.05	0.93
Mountains	88	41(46.6[b])	0.04	1

AEZ=Agro-ecological zone, Percentages with different superscripts on the same column differ significantly, Exp (B) = Exponential beta, S.E standard error

Table 4. The prevalence of wounds in different body regions.

Body region	No. of wounded examined	Prevalence (%)	X^2	P-Value
Back	164	82 (50.0)	4.11	0
Lips	164	24 (14.0)		
legs	164	19 (11.6)		
underbelly	164	38 (23.2)		

X^2= Chi-square value

Table 5 summarizes the prevalence of different wound categories and the chi-square revealed that the prevalence differed significantly (p=0.00) between different categories. Higher prevalence was recorded for abrasion (40.9%) and the least for incision (9.1%).

Table 5. Wound categories

Category	No. of wounded	Prevalence (%)	X^2	P-Value
Laceration	164	56 (34.1)	4.2	0
Puncture	164	26 (15.9)		
Incision	164	15 (9.1)		
Abrasion	164	67 (40.9)		

X^2= Chi-square value

DISCUSSION

The overall prevalence rate of wounds recorded in the current study was 39% and this provides ample evidence that the occurrence of wounds represents a fatal health challenge in equines in the study area. These results are in almost similar with the report of Jobir *et al*. (2021) in Shashogo Woreda, Hadiya zone Southern Ethiopia who revealed the overall prevalence of 37%. Similar close results were reported by Chala *et al*. (2017) in Bishoftu Town, Central Ethiopia who obtained the overall prevalence rate of 42.5%. Moreover, the current findings are in proximity with previous report by Pearson *et al*. (2000) who reported 44% prevalence from central Ethiopia. The current results are however far below 61.9% which was reported by Genetu *et al*. (2017) in Jimma Town of Oromia Region, South-Western Ethiopia. Furthermore, the current results deviate from the findings of Tesfaye *et al*. (2015) who reported 30.3% in and Around Mekelle town, Northern Ethiopia.

The disparities between different studies could be explained by several factors including but not limited to variation in the husbandry practices given to animals in different counties and regions.

The results of the current study in terms of wound prevalence between species are in accordance with the trend observed in the study of Genetu *et al*. (2017) South-Western Ethiopia who reported higher wound occurrence in horses (68.2%) than in donkeys (50.9%). Similarly, the current results are comparable to the report of Abdela *et al*. (2017) in Asella town, Southeastern Ethiopia who reported higher prevalence rate in horses (65.8%) than in donkeys (54.9%). These results however deviate from the findings of Fikru *et al*. (2015) who showed a slight difference in the occurrence of wounds between horses (64.2%) and donkeys (63.4%).

One possible reason for higher prevalence of wounds in horses obtained in the current study could be the fact that horses in the country are used quite intensively than donkeys and hence are likely to get wounded. Apart from that Abdela *et al*. (2017) reiterated that the variation in terms of wound prevalence between horse and donkeys could possibly be associated higher ability of donkey to survive in harsh condition and less susceptibility to infectious disease than horse.

The prevalence rate of wounds recorded for horses (53.5%) in the current study is in proximity with 51.5% which was reported by Teferi *et al*. (2020) however it is far above 25% prevalence which was obtained in Mekelle, Northern Ethiopia by Sisay (2013). The obtained prevalence of wounds for donkeys (24%) in the current study is slightly lower than 30.3% which was reported by Birhan *et al*. (2014) however it is far below 58.6% reported by Herago *et al*. (2015) in Wolaita SoddoZuria district. These discrepancies between different studies could possibly be explained by variations in the husbandry and management practices given to animals in different study areas.

The current findings confirmed that the prevalence of wounds was significantly influenced by sex and males (50.7%) were more affected than females (26.6%). In support of the current findings Satessa and Lemma (2014) reported significantly higher prevalence in males than in females. The current results are in accordance with the findings of Jobir *et al*. (2021) in Southern Ethiopia who confirmed higher prevalence rate in males (38.2%) than females (35.3%).

According to Abdela *et al*. (2017) higher wound prevalence in males could possibly be due to work type since males are frequently involved in works that predispose them to wound like cart pooling.

The current results revealed that the prevalence of wounds varied between different agro-ecological zones. These results are in line with the report of Teferi *et al*. (2020) who articulated that the variation in the prevalence rate of wounds is partly explained by differences in the agro-ecological zone. The higher prevalence rate of wounds in the foothills and the mountains could be attributed to limited road infrastructure in the remote areas which puts more pressure on the use of equines travelling long distances to carry goods hence increasing their chances of getting wounded. The unavailability of road infrastructure in remote areas of Lesotho has been confirmed by Kompi *et al*. (2021).

Moreover, in the mountains there are limited services like supermarkets which are mostly far from human settlements and normally equines are used to collect goods from such long distances. This confirms that equines in remote areas are used quite intensively more than those in the lowlands and hence are at higher risk of getting wounded.

In terms of wound distribution in different body parts, the current study revealed that wounds at the back in equine are common relative to other body regions. These results are comparable to the findings of Jobir *et al*. (2021) who stipulated that the prevalence of wounds in equines was higher on the back relative to other body regions. Similar results have been reported in central Ethiopia by Tesfaye and Curran, (2005) who articulated that the prevalence of wounds was significantly higher on the back than other body parts. According to Gizachew *et al*. (2013) wounds on working equines are frequently observed on the saddle (back) and wither regions. Higher wound proportion at the back has also been confirmed by Chala *et al*. (2017).

The probable reason for higher wound prevalence on the back in equines could be poorly designed and fitting tack which is likely to inflict wounds to the animal. One other possible reason is the use of broken saddles which is very common among horse owners in the country.

The results of the current study which show the lowest prevalence of wounds on the legs (11.6%) contradict the report of

Olaifa (2017) in Sounth West, Nigeria who reported the highest prevalence of wounds on the legs (57%) relative to other body regions.

Higher number of abrasion wounds (40.9%) obtained in the current study concurs with the report of Biffa and Woldemeskel, (2006) in Hawassa, southern Ethiopia. Similarly, Pearson *et al*. (2000) in Kombolcha town, northern Ethiopia reported higher incidences of abrasion wounds relative to other categories. The current results are in line with Fikru *et al*. (2015) who also reported higher abrasion wounds (61.7%) in North Ethiopia.

CONCLUSION

wounds represent a health challenge facing equines in the study. Sex group, species and agro-ecological zone are major risks factors associated with the prevalence of wounds in equines. Abrasion wounds are common relative to other categories. Wounds are mostly observed on the back of equines.

ACKNOWLEDGMENTS

Authors would like to convey a special gratitude to equines owners for their willingness to provide their animals for sampling. The extension officers from the Ministry of Agriculture are also acknowledged for their support during the data collection.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Abdela, N., Endale, T., Abdi, H., Feyissa, B.D., 2017. Prevalence and associated risk factors of equine wound in and around Asella town, South Eastern Ethiopia. J. Vet. Med. Anim. Health 9, 63-71

Asfaw, R., Ameni, G., Pal, M., 2012. Prevalence of Epizootic Lymphangitis in Cart Horses in Southwest Shewa of Oromia Region, Ethiopia. Int. J. Livest. Res. 2, 146-151.

Behnke, R., Metaferia, F., 2011. The Contribution of Livestock to the Ethiopian Economy - Part II, IGAD LPI Working Paper No. 02-11.43.

Biffa, D., Woldemeskel, M., 2006. Causes and Factors Associated with Occurrence of External Injuries in Working Equines in Ethiopia. Int'l J. Applied Res. Vet. Med. 4, 1-7.

Birhan, G., Chanie, M., Tesfaye, T., Kassa, A., Mekonnen, B., Wagaw, N., 2014. Incidence of wound and associated risk factors in working donkeys in Yilmana Densa District. Glob. Vet. 13, 133-140.

Burn, C., Pritchard, J., Farajat, M., Twaissi, A., Whay, R., 2007. Risk factors for strap-related lesions in working donkeys at the World Heritage Site of Petra in Jordan. Vet. J. 178, 263-271.

Chala, F., Birhanu, A., Tsegaye, T.B.A., 2017. Prevalence of Work Related Wound and the Associated Risk Factors in Cart Horses in Bishoftu Town, Central Ethiopia. J. Biol. Agric. Health 7, 17.

Curran, M., Feseha G., Smith, D., 2005. The impact of access to animal health services on donkey health and livelihoods in Ethiopia. Trop. Anim. Health Prod. 37, 47-65.

Dinka, H., Shelima, B., Abalti, A., Geleta, T., Mume, T., 2006. Socio-economic Importance and Management of Carthorses in the Mid Rift Valley of Ethiopia, Proceedings of the 5th International Colloquium on Working Equines.

Fikru, A., Tadese, A., Gebreegziabher, Z., 2015. Prevalence of Equine Wound and Associated Risk Factors in and around Kombolcha Town, North Ethiopia. J. Vet. Sci. Technol. 6, 4.

Genetu, H., Gebertsadik, Y., Nejash, A., Nuraddis, I., 2017. Prevalence of Wounds and Associated Risk Factors in Working Equines in Jimma Town of Oromia Region, South-Western Ethiopia. Aca. J. Anim. Dis. 6, 23-29, 2017

Getachew, M., Alemayehu, F., Chala, C., Amare, B., Kassa, D., Burden, F., Wernery, R., Werner, U.A. 2014. Cross sectional sero-survey of some infectious diseases of working equids in Central Ethiopia. J. Vet. Med. Anim. Health 6, 231-238.

Getachew, M., Trawford, A., Feseha, G., Reid, S.W.J., 2010. Gastrointestinal Parasites of Working Donkeys of Ethiopia", Trop. Anim. Health Prod. 42, 27-33.

Gizachew, A., Schuster, R.K., Joseph, S., Wernery, R., Georgy, N.S., 2013. Piroplasmosis in Donkeys - A Hematological and Serological Study in Central Ethiopia. J. Equine Vet. Sci. 33, 18-21.

Herago, T., Megersa, M., Niguse, A., Fayera, T., 2015. Assessment on Working donkey welfare issue in WolaitaSoddoZuria District, Southern Ethiopia. Glob. Vet. 14, 867-875.

Jobir, D., Belayneh, M., Shewangizaw, D., 2021. Prevalence of work related wound and associated risk factors indonkeys in Shashogo Woreda, Hadiya zone. Southern Ethiopia. Int. J. Adv. Res. Biol. Sci. 8, 218-226

Kompi, P.P., Molapo, S., Ntsaoana, M.E., 2021. Prevalence and faecal egg load of gastrointestinal parasites in horses in maseru district, lesotho. J. Anim. Health Prod. 9, 5-12.

Mekuria, K., Tesfaye, W., 2016. Prevalence of wound and associated risk factors in working donkeys in and around Wolaita Sodo Town, Southern Ethiopia. Int. J. Agric. Sci. Vet. Med. 4, 4.

Mekuriaw, H., 2019. The socio-economic importance of horses used for carting in Bishoftu, central Ethiopia. DVM Thesis, College of Veterinary Medicine and Agriculture, Addis Ababa University, Bishoftu, Ethiopia.

Olaifa, A.K., 2017. Epidemiological study on wound distribution pattern in horses presented at two veterinary clinics in south west, Nigeria between 2007- 2010. J. Dairy Vet. Anim. Res. 5, 4.

Pearson, R.A., Mengistu, A., Agajie, T., Eleanor, F.A., David, G.S., Mesfin, A., 2000. Use and management of donkeys in peri-urban areas of Ethiopia. Centre for Tropical Veterinary Medicine: University of Edinburgh, Scotland. Draught Animal. Power Technical Report, p. 5.

Satessa, G.D., Lemma, F.A., 2014. Prevalence of External Injuries in Working Equines in Mehal Saint Woreda of South Wollo Zone, Ethiopia. J. Vet. Adv. 1, 654-660.

Sells, P.D., Pinchbeck, G., Mezzane, H., Ibrouki, J., Crane, M., 2010. Pack wounds of donkeys and mules in the Northern high Atlas and lowlands of Morocco. Equine Vet. J. 3, 219-226.

Sisay, W.Z., 2013. Causes and Factors Associated with the Episode of External Injuries in Cart-Horses of Mekelle Town, North Ethiopia. J. Vet. Adv. 3, 265-274.

Teferi, M., Tesfaye, R., Zewdu, H., Gemechu, G., Gebre, T., Tibebu, A., 2020. Prevalence of wound, its associated risk factors and wound management practices in carthorses of ten selected towns of Ethiopia. Ethiop. Vet. J. 24, 1-15.

Tesfaye, A., Curran, M., 2005. A longitudinal survey of market donkeys in Ethiopia. Trop. Anim. Health Prod. 37, 87-100.

Tesfaye, A., Yohannes, T., Habtamu, T., Kalab, G., Hagos, T., 2015. Survey of Common Skin Problem of Working Equines in and Around Mekelle, North Ethiopia. Acad. J. Anim. Dis. 4, 30-38.

Tesfaye, W., Mekuria, K., 2017. Prevalence of Wound and Associated Risk Factors in Working Donkeys in and around Wolaita Sodo Town, Southern Ethiopia. J. Biol. Agric. Health. 7, 9.