

Health constraints of Cart Horses in the Dry warm, Sub-moist tepid and Moist cool Climatic Zones of Central Ethiopia

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Abstract

The objectives of this study were to identify the major health and welfare constraints of cart horses in the dry warm, sub-moist tepid and moist cool climatic zones of Ethiopia. The study was cross sectional and a total of 837 horses were examined. Five major health problems and welfare issues were identified. Lymphangitis was recorded in 9.3 % of the horses in the sub-moist zone only. Eye problems were recorded in 32.1 % the horses of which 12.3 % had one blind eye and horses in the tepid sub-moist zone were more affected than horses in the moist cool zone (OR = 5.25; 95% CI = 2.94, 9.52). Injuries of the withers were recorded in 47% of the horses. Unsympathetic drivers' attitudes were predisposing factors of wounds on the inguinal region (19.7 %) and carpal joints (8%). Lameness and fetlock injuries were recorded in 13% and 16.6% of the horses respectively. The health constraints and welfare issues are of considerable importance and merit attention. The use of improved harnessing systems, proper shoeing and sympathetic attitudes of drivers could enable to efficiently utilize horses' power.

Key words: Carthorses, Ethiopia, Health, Welfare

Introduction

Horses have a prominent position in the agricultural and transport systems of Ethiopia as draft, pack and riding animals. In urban and peri-urban set-ups where electromotive power is absent or does not satisfy the transport needs, carts are common forms of transportation. Whilst horses are commonly used to pull carts, in some areas mules are also used. Diseases and poor husbandry practices are major constraints in the utilization of horses and there are reports on the occurrence of important diseases including African horse sickness (Mellor and Hamblin, 2004), Lymphangitis (Gobena Ameni, 2006), and Dourine (Hagos Ashenafi *et al*, 2010). However, systematic studies on the epidemiology of horse diseases are limited and intervention measures are nonexistent.

Compared to equines in the rural areas, animals in urban areas are over-worked, of low life expectancy and at a higher risk of disease transfer (Pearson, 1998). As climatic heterogeneity is a feature of the country, the prevalence of horse diseases may also differ in the various climatic zones and sub-zones. The objectives of this study were to identify the major health problems and explore potential welfare issues of working cart horses in the dry warm lowland, sub-moist tepid mid highland and moist cool highland areas of central Ethiopia.

Materials and Methods

Study Areas

The study was conducted in three agro-ecological zones of Central Ethiopia. The study areas included Akaki, Debre Berhan, Debre Zeit, Nazareth and Sebetta situated within a radius of 130 kms from Addis Ababa. Whilst Nazareth is in the dry warm zone, Debre Zeit, Akaki and Sebetta are in the sub-moist tepid mid altitude zone and Debre Berehan is a moist cool highland.

Study design

The study was cross-sectional and conducted in 1997. The number of carts that provided transport services was 1551. The study populations were animals registered by cart associations. Assuming two horses per cart, the number of horses was estimated at more than 3000 and 837 horses (>28% of the estimated horse population) were included in the study. A systematic random sampling method by using lists of plate numbers of carts was used to select animals in each location. The numbers of animals in the dry warm, sub-moist tepid and moist cool climatic zones were 253, 440 and 144 respectively. Clinical examinations were done on each horse and faecal samples were taken to examine the presence of GIT parasites. The number of eggs per gram of faeces (EPG) was estimated by the modified McMaster egg counting method and parasite burdens were classified as mild, moderate and severe (Soulsby, 1982).

Data analysis

Descriptive statistics was used to describe the data. The Pearson's Chi-square and the Fisher's exact tests were used to test associations. Alpha () was set at 0.05. The data was analysed by using Epi Info™ (Version 3.5.1., Center for Disease control, USA).

Results

Clinical examination

Lymphangitis was recorded in 9.3% of the horses in the sub-moist tepid zone only (Table 1). The distribution of the lesions was significantly affected by body region ($\chi^2 = 58.78$; $P = 0.000$) and the anterior half, 59 (81.94%) was more affected than the posterior half, 13 (18.06%), (OR = 20.6; 95% CI = 8.18, 53.31).

Table 1. Prevalence of Lymphangitis by climatic zones, in central Ethiopia

Agro-climatic zone	Number examined	Number Positive (%)
Dry warm lowland	253	0 (0)
Sub-moist tepid mid highland	440	41(9.3)
Moist cool highland	144	0(0)
Total	837	41(4.9)

Eye problems were recorded in 32.1% of the horses of which 33(12.3 %) were with one blind eye. Eye problems were significantly associated with climatic zone ($\chi^2 = 40.16$; $df = 2$; $P = 0.000$). Horses in the tepid sub-moist zone were more affected than horses in the moist cool zone ($\chi^2 = 39.96$; $P = 0.000$; OR = 5.23; 95%CI = 2.93, 9.48), (Table 2).

Table 2. Prevalence of eye problems by climatic zones in central Ethiopia.

Agro-climatic zone	Number examined	Number with problems (%)
Moist cool	144	16 (11.1)
Dry warm	253	79 (31.2)
Sub-moist tepid	440	174 (39.5)
Total	837	269 (32.1)

Withers injuries were recorded in 393(47 %) horses. The occurrences of strap associated injuries were significantly affected by body region ($\chi^2 = 19.44$; $df = 4$; $P = 0.000$): neck and chest (27%), thigh (26.5 %), heart girth (22 %), tail base (12.8%) and shoulder (5.6%). Sixteen horses (1.9 %) had bit associated injuries.

Whip/stick inflicted injuries were recorded on the inguinal (19.7%), carpal (8%), croup (5.14%) and thigh (14.6%) areas ($\chi^2 = 103.1$; $df = 3$; $P = 0.000$). Location significantly affected the occurrence of inguinal injuries ($\chi^2 = 14.16$; $df = 1$; $P = 0.000$) with a higher prevalence at Sebetta, 121(87.1 %) than at Akaki 44 (26 %) (OR = 19.1; 95% CI = 10.06, 36.64). Falling and wounds on the carpal joints were recorded in 67(8 %) horses.

Fetlocks injuries were recorded in 139 (16.6 %) horses. The wounds were significantly associated with limb position ($\chi^2 = 48.97$; $df = 1$; $P = 0.000$) and the front limbs, 109 (13%) were more affected than the hind limbs (3.6 %) (OR = 4.03; 95% CI = 2.63, 6.33).

Lameness was recorded in 109 (13%) horses. Of the lame horses, 23 (21.1 %) had damaged hooves of which 14 (60.7%) had fissures and 9 (39.3%) had apparent laminitis. Non-physical skin lesions 23(2.7%), respiratory problems 17(2%), tumors 3(0.4%), ticks 17(2%) and anemia 47(5.6%) were recorded.

Table 3. Occurrence of GIT helminthes by climatic zones in central Ethiopia.

Zone	Number Examined	Number Positive (%)	Severity of infestation, number (%)		
			Mild	Moderate	Severe
Dry warm	25	23(92)	18(72)	4(16)	1(4)
Moist cool	23	21(91.3)	13(56.5)	3(14)	5(21.7)
Total	48	44(91.6)	31(70.45)	7(14.6)	6(12.5)

Helminthes eggs were detected in 91.6 % of the horses (Table 3) and the EPG ranged from zero to 3200. Moderate to severe infestations were recorded in 13(27.1 %) horses. The numbers of infested horses did not differ between the warm and cool zones ($P > 0.05$).

Discussion

Multiple health constraints that included lymphangitis, eye problems, the harnessing system, unsympathetic attitudes of drivers, conformational defects farriery inflicted injuries and infestations with helminthes were identified.

Lymphangitis was recorded in the tepid mid highland zone only and the clinical and epidemiological evidences were suggestive of Epizootic lymphangitis. However, cart drivers/owners reported the occurrence of the disease in the dry warm zone (data not shown). The discordance could be because drivers/owners in the dry warm zone perceived affected horses of the nearby medium altitude areas as horses of their town but in this study only horses registered by the cart associations of each location were considered. Epizootic lymphangitis was reported in mid-altitude areas only Gobena Ameni, (2006) and Epizootic and ulcerative lymphangitis occurred in a ratio of 26 to 1(Bojia Endebu and Roger, 2004).

Eye problems were considerable health constraints of horses in all climatic zones. The present estimate was higher than what was reported for donkeys (5.4 %) Getachew Mulugeta *et al.*, (2002) and the difference could be due to host genetic factors. Furthermore animals working in urban setups are at a high risk of disease transfer compared to rural animals (Pearson, 1998). Although several factors including fly strikes Getachew Mulugeta *et al.*, (2002), physical injuries, *Onchocerca cervicalis* Cello, (1971) and thelaziosis Otranto and Traversa, (2005) could cause eye problems, infection with leptospira is the most commonly implicated agent of blindness in horses (Dawyer, 1995; Faber *et al.*, 2000; Niedermaier *et al.*, 2006; Brandes *et al.*, 2007). Therefore, the higher seroprevalence (91%) of leptospiral infections Moch *et al.*, (1975) and the significant proportion of horses with eye problems are suggestive of leptospira to be a prime suspect.

Several horses had injuries on the withers. The observation is comparable with a study in southern Ethiopia Demelash Bifa and Moges Woldemeskel, (2006) where more than 30 % of the horses examined had harness inflicted injuries. The carts are two wheeled and the saddles are neither broad enough to allow pressure distribution on the sides nor the angles ensure adequate clearance of the spine. The down ward vertical forces exerted by the load as well as the angular incompatibilities and the narrow pressure areas coupled with the poor padding could be the major causes of injuries at the withers and the upper thoracic regions.

Rubbers salvaged from cars' tyres were the principal components of the straps. The straps were hard, unpadding and often repaired with wires and nails. The sharp edges of the straps and the materials used to repair could cause injuries at the contact areas. In addition, the unnecessary upward vertical forces of the loads transferred through the shafts to the harness straps around the heart girths including the horizontal back ward forces of the loads on the neck/chest regions could augment the lacerating and cutting potential of the straps.

Unsympathetic drivers' attitudes towards horses were predisposing factors of wounds on the carpal joints and inguinal regions. Falling and the subsequent wounds on the carpal joints could have occurred when animals were forced to pull loads greater than their pulling power or gallop on rough roads. Mishandling and unsympathetic attitudes of drivers were identified as predisposing causes of leg injuries of carthorses in Gondar, Ethiopia (Bradbury, 2002).

Punishment by using whips or sticks were the methods of horse driving in all areas. At Sebetta, most drivers punish horses by whipping at the inguinal region. In some horses, the wounds were suppurating and covered the lower abdominal area, the inner thigh and the external genitalia. Such wounds appear to have occurred due to the frequent application of whips in already injured areas with superimposed infections. The injuries were examples of physical abuses of animals and evidences of the frequent collisions of drivers' and horses egos due to failures of the former to establish good working relationships with latter. If an animal is repeatedly exposed to pain, neurosis may develop and if the pain stimuli are inescapable learned helplessness may set in and the animal no longer tries to cope but becomes dull (McGreevy and McLean, 2009).

The fetlock wounds were due to conformational defects and interference of the limbs. Apart from reducing the pulling efficiency of horses, conformational defects predispose horses to injuries. Carthorses were not selected on the basis of their conformation and several horses with defects on the neck, shoulder and back were used to pull carts.

Lameness was recorded in a significant proportion of the horses. The estimate was based on a passive visual clinical examination and appears to be lower than what it might have been. Improper shoeing could be one of the major causes of the lameness. The importance of farriery inflicted injuries in horses of Gonder, Ethiopia was reported (Bradbury, 2002). In Mexico, estimates of 100 % and 90% were reported for lameness above grade 1 and grade 2 respectively (King *et al.*, 2009). In Iran, incorrect shoeing accounted for 4.8 % of the cases of lameness (Naeini and Niak, 2005). Similarly, the visible damages of the hooves and the traditional shoeing method (the shoes, pads and nails were locally produced) observed in this study lead to contend that incorrect shoeing could be a major cause of lameness in a considerable proportion of carthorses in Ethiopia.

Infestation with helminthes was recorded in several horses. The results are in agreement with reports of Adem Hiko and Bula Mengesha (2010) in horses and Ayele Gizachew *et al.*, (2006) in donkeys of Ethiopia. However, the severity of infestation was lower than that of rural horses (51%) Adem Hiko and Bula Mengesha, (2010) and donkeys (82 %) (Ayele Gizachew *et al.*, 2006). These differences could be due to the restricted accesses to grazing and the relatively better health care provided to carthorses compared to rural horses and donkeys. The similarities in the occurrence of helminthes infestations between the

dry warm and moist cool climatic zones may be due to the similarities of the deworming frequencies. However the apparently higher moderate to severe infestation recorded in the highland area indicates higher pasture infectivity and/or a relatively higher access of horses to grazing. In general the results imply the importance of gastro-intestinal parasitism and the need for regular deworming of carthorses.

The study revealed multiple health constraints and welfare issues of carthorses. Lymphangitis and eye problems are important problems that merit attention. Four wheeled carts could reduce the occurrence of injuries and the use of animals with proper conformation, proper shoeing and sympathetic attitude of drivers towards working horses could improve the utilization of horses' power in areas where economic realities limit the use of electromotive forces in the transport system. As there are a few studies on the epidemiology of horse diseases in Ethiopia, this study supplements other studies on the same and could be used as an input in designing further studies.

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