

Farmers' perception of dourine in selected districts of Arsi-Bale highlands of Oromia Region, Southeastern Ethiopia

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Abstract

In Arsi-Bale highlands, the one common factor leading to the ill health, suffering and early demise of equines is the protozoan parasite, *Trypanosoma equiperdum*, causing dourine. Assessment of farmers' perception of dourine was studied in selected districts of Arsi-Bale highlands of Oromia region, Southeastern Ethiopia from September 2015 to June, 2016. A standardized questionnaire survey was administered to collect relevant information from a total of 84 farmers about perception of dourine. The findings of this study disclosed that 94.1% of the respondents ranked dourine as an economically important disease of equines. Dourine, locally known as 'Lappessa' or 'Dirressa' or 'Dugda Kuta' which means a disease causing emaciation and paralysis of the hind legs. Since dourine is transmitted by coitus and due to the marked emaciation observed in late stages of the disease, some farmers call it 'Horse's AIDS'. The reported dourine suggestive signs were consistent with published reports and farmers strongly associated the occurrence of the disease with sexual contact with sick animals. Clinical signs used in the area for the diagnosis of dourine include paralysis of the hind quarter, in coordination, poor body condition, weakness, foul discharge from reproductive organs in both sexes, ventral odema. About 75% of the respondents also explained that the seasonality of the disease where long rainy periods from June to September to be peak risk months of the year. A total of 30% of the respondents a second peak is observed in the dry seasons of the year (March to May), which was probably associated with relapse of previously infected and recovered cases due to stressful conditions of feed shortage. Good knowledge of farmers' perceptions on the disease dourine is an important prerequisite for implementing effective control implementation with active participation of animal owners.

Keywords: Arsi-Bale highlands; Dourine; Ethiopia; Farmers' perception

Introduction

Ethiopia is one of the leading countries in Africa and in the world with respect to its huge equine population. In a developing country like Ethiopia, equines have a prominent position in the agricultural and transport systems as draft, pack and riding animals (Pearson, 2005). Despite the significance of horses in the sector of transportation and agriculture to the economy of the nation, the treatment accorded to these species of animals has been far below that given to other species of animals. This can partly be due to the age-old erroneous concept that these species are hardy, tolerant and probably because they are not providers of meat and milk (Fesseha Gebreab, 1998; Pritchard *et al.*, 2005). African horse sickness, anthrax, epizootic lymphangitis, dourine, equine piroplasmiasis, horse mange, rabies, glanders and ulcerative lymphangitis are among the major diseases that affect horses in Ethiopia (FAO, 1996). Dourine is a chronic or acute contagious trypanosomal disease of breeding solid-peds that is transmitted directly from animal to animal during coitus. Dourine is the only trypanosomiasis that is not transmitted by an invertebrate vector. *T. equiperdum* differs from other trypanosomes in that it is primarily a tissue parasite that rarely invades the blood (Claes, 2003; Getachew Abebe, 2005).

The available information on the impacts of dourine and its management and control are scanty in the area. Therefore it is imperative to assess farmers' knowledge and attitudes, on the presence, impact, diagnosis, treatment and control of dourine in Arsi-Bale highlands. Understanding of farmers' knowledge and perceptions on the impacts of dourine and their participation in developing intervention strategies are prerequisites for effective implementation. Hence, this study at a hand was conducted to assess farmers' perception on the presence and the need of intervention programs of dourine in selected districts of Arsi-Bale highlands of Oromia Region Southeastern Ethiopia.

Materials and Methods

Study area

The study was conducted from September 2015 to June, 2016 in two selected horse-breeding districts of the Arsi-Bale highlands of Oromia Regional State in South eastern Ethiopia, namely Dodola, and Dinsho. The Arsi-Bale high-

lands are found in the Oromia Regional State southeast of the country where Asela and Robe, the capitals of Arsi and Bale zones, are located 175 and 430 kms away from Addis Ababa. Topographically, the altitude ranges from 500 to 4,130 meters above sea level, where a central plateau predominates with a narrow lowland area. Three climatic zones, including an arid, tropical highland and tropical forms, are known to exist. The area experiences a bimodal rainfall occurring from July to October and April to May. Average annual temperature of 20–25°C and rainfall of 200 mm in the lowlands as well as 10–15°C and a rainfall of 400 mm in the highlands are recorded. Agriculture is the mainstay of the livelihood of peoples and the leading economic activity of the area with a mixed farming system covering 90% of the total agricultural activities with crop–livestock production (Arsi-Bale Zone Plan and Economic Development Office, 2015).

Study design

A cross sectional study design involving a standardized questionnaire survey was employed to generate information on farmers' perception on dourine impact and management of dourine in the study areas.

Sampling strategy

A multistage random sampling procedure was applied to select districts, peasant associations and households/farmers in the study districts (Mahama et al., 2004). The sample size of participants was determined using the formula ($n = 0.25/SE^2$) at the standard error (SE) of 0.0545 with 95% confidence interval (Thrusfield, 2005). Animal health/production extension workers and village community leaders and elders were involved in the identification of key informants and households that keep livestock within the area. Field assistants/enumerators with knowledge of animal health/production, familiarity with the study areas and ability to speak the regional language Oromiffa were hired in order to support as well as carry out the interviews.

Consequently, a semi-structured questionnaire was administered to a total of 84 randomly selected farmers/equine keepers (42 from each district) in order to explore their perception of dourine. Before the interview, the objective of the research was explained to each participant and full consent of the interviewee was obtained. Identities of the equine keepers interviewed were kept confidential to facilitate open and accurate responses. Each interview was restricted to

40–45 minutes. The questionnaire was pretested before the actual survey for time, resource and relevance of type of questions included. The questionnaire focused mainly on farmers' perception on the presence, impact and management of dourine and their desire for establishment of intervention programs against the disease. Then, major information obtained from individual interviewee was later supplemented by discussion with a total of 25 key informants (ten animal health personnels and ten agricultural extension workers and five community elders).

Data analysis

Microsoft Excel spread sheet program was used to manage the raw data. Descriptive statistics (frequency, percentage, mean, and chi-square test) were used to analyze the qualitative data (dependent and independent variables) data. Accordingly, the dependent variable was farmers' perception of dourine while independent variables were problem of dourine and its current status, animal origin, clinical signs and seasonality of the disease, efficacy of treatment to cure clinical cases. Throughout the analysis, p -value < 0.05 was considered to have statistically significant difference (Thrusfield, 2005).

Results

Farmers' perception on the presence of dourine

The three main diseases of equines in Arsi-Bale highlands of Ethiopia were anthrax, epizootic lymphangitis and dourine. Internal parasites were also important disease problems. Other diseases indicated with relatively less frequencies include mange mites, glanders, external parasites, wounds, ring worm and African horse sickness (AHS) (Table 1).

Table 1. Relative frequencies of the main diseases of equines in the Arsi-Bale highlands of Ethiopia

Rank	Diseases									
	E. Lymph.	Mange mites	Dourine	Anthrax	Glanders	Int. para	Ext. para	Wounds	Ring worm	AHS
1	27.3	0.0	25.8	46.4	1.5	1.5	1.5	1.5	0.0	3.0
2	37.1	4.8	19.4	19	0.0	4.8	4.8	6.5	1.6	1.6
3	17.1	2.4	48.8	14.7	0.0	14.6	4.9	2.4	0.0	2.4

E. Lymph. = Epizootic lymphangitis, Int. Para = Internal parasites, Ext. Para = External parasites and AHS = African Horse Sickness.

Animal owners and professionals interviewed reported that dourine is a major health problem of horses causing high mortality and economic loss (Table 2). About 70% of the farmers reported that the first sign of the disease in clinically affected horses is incoordination, especially of the hindquarters and swelling of the external genitalia. The disease is locally known by different names as “Lappessa” mainly by the Arsi farmers, which refers to the extreme emaciation of affected cases, “Dugda Kuta”, “Kuta” or “Diressa” by the Bale people which refers to the hind leg paralysis (in English it means back bone breaker). Since dourine is principally transmitted by coitus and moreover, attributed to the absence of curative treatment nor prophylactic vaccine and the marked emaciation observed in late stages of the disease, some farmers used to call it “Horse’s AIDS”. A total of 42% of the respondents associated the disease incidence with horses having sexual contact with diseased horses.

Table 2. Interview results of individual farmers’ perception (n=84) about dourine

Interview (Points of focus)	Proportion of respondents %	95 % CI
Previous problem of dourine	53.33	(66.06, 40.60)
Dourine a major disease of horses	68.33	(80.20, 56.46)
Mares with previous history of abortion	20	(30.20, 9.80)
Animal history (Origin)		
Born on farm	63.33	(75.63, 51.04)
Bought outside Arsi-Bale local markets	36.67	(48.96, 24.38)
Seasonality of the disease occurs		
Yes	85	(94.11, 75.89)
No	15	(24.11, 5.89)
Status of the disease		
Getting worse	60	(72.50, 47.5)
Getting better	10	(17.66, 2.34)
No change	30	(41.69, 18.31)
Treatment of clinical cases		
Cases cure	11.67	(19.86, 3.48)
Cases relapse	88.33	(97.84, 78.8)

Horses are treated against dourine irregularly, when trypanocidal drugs are available and even such treated animals show frequent relapse and generally

treatment is not effective enough to cure clinical cases as testified by 65% of the respondents. Some of the trypanocidal drugs used in the area, whenever available include Verbien (Diminazene aceturate) of Pakistan and Korea products and in the past before ten years' time Quinapyramine sulphate (Triquin-S[®], Wockhardt Veterinary Ltd., India). According to the questionnaire survey smugglers, owners and veterinary personnel involved in the treatment of dourine infected animals. Majority of livestock keepers 95.2% (92.9% in Dodola and 97.6% in Dinsho) reported that they are familiar with dourine (locally called 'Lappessa' or 'Dirressa'). Among these, 94.1% of the respondents listed dourine as the prime economically important equine disease in the highlands.

Farmers' perception of clinical signs of dourine

Livestock owners' noticed that different clinical signs of dourine that could be easily identified through visual observation. Though, the level of precision depends on the experience of the livestock keepers, among the observed signs of dourine: paralysis of the hind quarter (72%), in coordination (70%), poor body condition (65%), weakness (60%), foul discharge from reproductive organs in both sexes (51%), ventral odema (42%) were the most frequently reported clinical signs of dourine by livestock keepers. In addition to this, respondents emphasized that in equine suspected of dourine, noticeable reductions could be observed on working ability of animals and abortion in females and increased mortality rate in untreated cases.

Perception on seasonality of dourine

Interviewees and key informants have declared that dourine has wide seasonal variations. About 64.2% of the respondents from interview explained that dourine reach peak level during long rainy season (June to September) in terms of profound morbidity and mortality effect of the disease. In this aspect, there was no statistically significant difference ($p > 0.05$) among districts. On the other hand, 83% of the respondents ascertained that the challenges of dourine become mild in the dry season, particularly, in November, December, January and February. Similarly, key informants also disclosed the seasonality of the disease occurrence where peak level being observed in long rainy season.

Willingness of livestock owners for establishment of intervention program

According to the information obtained, there was no launched governmental or non-governmental dourine intervention activity in the study areas. Almost all (96.3%) of the respondents, had positive perception attitude for the establishment of dourine intervention program in their surroundings. About 87.7% and 35.4% of the livestock keepers expect treatment services and drug supply benefits from the coming project, respectively. Moreover, 92.7% of the respondents stated their willingness to contribute their support (by money, labor and/or protection) if intervention program will be established in their surroundings.

Discussion

The present study explored the farmers' perception of dourine in the Arsi-Bale highlands of Ethiopia. Of the reported diseases, dourine has been perceived as the number one obstacle to equine production in the study areas. The major diseases of equines in the area were anthrax, epizootic lymphangitis and dourine. According to Gobena Ameni (2006) AHS is the main disease in Ethiopia, followed by epizootic lymphangitis, dourine, mange, anthrax, rabies and babesiosis.

Although it was not possible to trace the origin of the spread of the disease or to associate the first occurrence of the disease with any particular event in the past, farmers consider dourine to be introduced into the country at times of colonization attempt by Italy. It was emphasized by the farmers as well as professionals that the problem of dourine is becoming more and more severe and increasing its extent and magnitude, as there is no effective curative or prophylactic therapeutic agents and treatment take place whenever trypanocidal drugs are available.

Farmers are aware also that the disease has a seasonal character, which mainly coincides with the breeding season. Professionals reported that relapses are common in previously treated animals usually at times of feed shortage and stress in the dry seasons of the year. A prominent feature of trypanosomiasis is the relapsing nature of the disease where there is periodical expression of surface coat glycoproteins of a differing antigenic nature (Hoare, 1972).

However, treatment of clinical cases in such endemic areas seems to be beneficial taking into account the indispensable role played by horses in the Arsi-Bale highlands due to the rugged mountainous terrain of the area where these animals are still the main method of transporting both people and agricultural products and as treatment reduces mortality and results in marked improvement of clinical signs. This is due to the fact that whether clinical cases are treated or not, the animals will tend to be carriers. Therefore, in such an endemic area, where it is difficult to effectively control the disease, it will be worth treating clinical cases to alleviate the disease, enable animals to perform well and thereby reduce mortality.

Both farmers and professionals stressed the issue of lack of availability of trypanocidal drugs for the treatment of clinical cases of dourine. Furthermore, the presence of drug smugglers, retailers in the local open-air markets and the practice of self-treatment by the farmers, has raised the fear of drug resistance for dourine, as it has been the case for other tsetse transmitted trypanosomiasis in other parts of the country. Drug therapy has been the main strategy used in the past to control trypanosomiasis throughout Ethiopia (Getachew Abebe and Yilma Jobre, 1996). There is a flourishing black market and farmers can purchase a variety of trypanocidal drugs in most village markets (Questionnaire result), although all trypanocidal drugs are supposed to be imported through the Veterinary Drug and Feed Administration and Control Authority. The observed widespread use and misuses of trypanocidal drugs in the Arsi-Bale highlands will definitely result in the development of drug resistant population of *T. equiperdum* (Holmes *et al.*, 2004). Apart from the question of clinical efficacy of the available drugs, the problem with trypanocidal drugs become exacerbated, as there is no regular as well as sufficient supply of trypanocidal drugs to the veterinary clinics in the endemic areas of the Arsi-Bale highlands. There is strong evidence that dourine is highly prevalent, most important problem in the Arsi-Bale highlands necessitating urgent national control intervention. Thus, control strategies against dourine should be integrated with the local farmers' participation to minimize the impacts of the disease in the area.

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