The diagnostic capacity of veterinary field staff in the Nkhotakota District of Malawi

Chikungwa, P.

Abstract

The limited capacity of the Malawian public sector to efficiently deliver animal health services and the inaccurate disease database were highlighted as some of the challenging constraints during the 1999 National Livestock Development Master Plan (NLDMP) survey. Veterinary Assistants (VA) distributed in the dip tanks and veterinary stations throughout the country are supposed to generate the livestock disease information which is channelled to the policy decision makers at headquarters. A study was conducted to assess the diagnostic capacity of those VAs and to determine the livestock owners' ability to detect sick animals. The study focused on the diagnosis of tsetse-transmitted bovine trypanosomosis in Nkhotakota District.

Results showed that VAs were able to identify animals in poor conditions but no relationship was observed between their diagnosis and the actual trypanosomal infection status of the animals. Livestock owners were aware of disease problems but lacked ability to detect animals in poor condition.

Keywords: Malawi, Animal health services, Livestock disease information, Diagnostic capacity, Trypanosomosis

Résumé

La capacité limitée du secteur public malawien à fournir efficacement des prestations de service en santé animale et l'imprécision de la base de données sur les maladies ont été reconnues comme des contraintes importantes à l'occasion de l'enquête de 1999 dans le cadre du Programme National de Développement de l'Élevage (NLDMP). Les Assistants Vétérinaires (VA) qui sont répartis dans tout le pays au niveau des dipping-tanks et des stations vétérinaires, sont supposés générer l'information sur les maladies du bétail qui est, ensuite, canalisée vers les responsables de la politique au quartier général. Une étude a été réalisée pour évaluer la capacité diagnostique de ces VA et déterminer les aptitudes des propriétaires de bétail à détecter les animaux malades. L'étude s'est concentrée sur le diagnostic de la trypanosomose bovine, transmise par la mouche tsé-tsé, dans la Zone Nkhotakota.

Les résultats ont montré que les VA étaient capables d'identifier des animaux en mauvaise condition, mais aucune relation n'a été observée entre leur diagnostic et le statut réel des animaux en matière d'infection par la trypanosomose. Les propriétaires de bétail étaient conscients des problèmes de maladie, mais ne possédaient pas la capacité à détecter des animaux en mauvaise condition.

Mots-clés : Malawi, Services de santé animale, Information sur les maladies du bétail, Capacité diagnostique, Trypanosomose.

Resumo

A capacidade limitada do setor público malawiano de prestar serviços de saúde animal eficientes e o inacurado banco de dados de patologias foram destacados como alguns dos desafios limitantes durante a Pesquisa do Plano Piloto de Desenvolvimento da Pecuària Nacional em 1999. Assistentes veterinários (VA) distribuidos nas áreas de tanques de imersão e postos veterinários por todo país, devem fornecer a informação sobre a doença do rebanho a qual é transmitida à responsáveis pela decisão política em quartéis-generais. Um estudo foi conduzido para avaliar a capacidade de diagnóstico dos VA e a habilidade dos proprietários de gado para detectar animais doentes. O estudo concentrou-se no diagnóstico da tripanossomiase bovina transmitida por tsé-tsé no distrito de Nkhotakota. Os resultados mostraram que os VA foram capazes de identificar animais doentes mas não foi observada relação entre o diagnóstico e o quadro existente de infecção tripanossomial dos animais. Os proprietários de gado estavam informados quanto aos problemas da doença mas careciam de habilidade para detectar animais em más condições.

Palavras-chave: Malawi, Serviços de saúde animal, Informação de doença do gado, Capacidade de diagnóstico, Tripanossomiase

Department of Animal Health & Livestock Development, Central Veterinary Laboratory, P.O. Box 527, Lilongwe, Malawi.

Introduction

An accurate assessment of the animal health situation in a country is an essential element in the formulation of disease eradication or control programmes. In most developing countries, however, it is difficult for veterinary services to establish accurately the prevalence of various diseases affecting livestock. This is due to various reasons ranging from inadequate numbers of field veterinarians and technicians, lack of incentives to scarcity of well-equipped diagnostic laboratories with well trained technicians (Lefèvre et al., 1993). Nevertheless, the successful control of diseases depends initially on its timely and accurate recognition and thus on the presence of diagnostic capacities and capabilities

In Malawi also, the animal health policy aims at protecting the national herd against diseases of national economic importance by maintaining an effective and comprehensive disease surveillance programme. Unfortunately, the limited financial capacity of the department of veterinary services has affected seriously the diagnostic capacity of this department. Especially for endemic parasitic diseases such as tsetse-transmitted trypanosomiasis and tick-borne diseases the necessary tools to identify infected animals are not available at the field level. Hence, information on the prevalence of those diseases relies almost entirely on the verdict of the veterinary field staff and is based on visual inspection of the animal. To determine the diagnostic value of this physical inspection in the diagnosis of tsetse-transmitted trypanosomiasis a trial was conducted at the edge of the Nkhotakota game reserve.

Material and methods

Study Area

The study was conducted in August 2003 in Kamphambe dipping area (34° 15' 49" E 12° 58' 05" S) of Nkhotakota District (Figure 1). The area is located between the eastern edge of Nkhotakota Game Reserve and shores of Lake Malawi. A total cattle population of 1319 animals was recorded in the area during the census conducted in May 2003. In a survey conducted between 1995 and 1997, trypanosomal infections were detected in cattle sampled within the vicinity of Nkhotakota Game Reserve (Van den Bossche et al., 2000). Apart from trypanosomiasis, other common endemic diseases in cattle include tick-borne diseases particularly theileriosis (ECF) and anaplasmosis. Helminth infections and malnutrition (especially in dry season) are also major causes of production losses and deaths particularly in young calves and small ruminants. The delivery of animal health services to the area is generally perceived as poor due to inadequate coverage and limited resources by the Veterinary Assistant
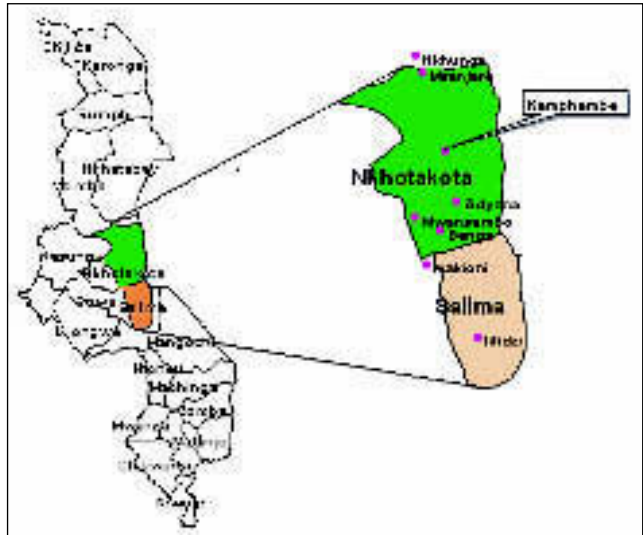

Figure 1: Map of Malawi showing the study area in Nkhotakota District.

Selection of veterinary assistants, livestock owners and experimental animals

Nine Veterinary Assistants (VA's) from Nkhotakota and Salima Districts were selected for the study. They had different background but all Va's, except one, had previous knowledge on trypanosomiasis.

Twenty-five cattle owners were randomly selected with the assistance of the Veterinary Assistant of the area and the local authority of the Livestock Development Committee (LDC). The cattle owners were smallholders with small herds, keeping on average 10 cattle per herd. A random sample of 75 animals was selected from a total of 281 presented on the day of sampling.

Animal health condition scoring and diagnosis

Every selected animal was examined physically for about 5 minutes in a crushpen by the VA's and the livestock owners. The condition of each animal was determined by giving it a score on a 1 to 4 (1= very poor 2= poor 3= good and 4= excellent) by the VA's and the cattle owners. Furthermore, depending on their clinical assessment, VA's were asked to diagnose the disease of the animals they considered sick.

Diagnosis of trypanosomiasis

From each of the 75 experimental animals blood was collected from the jugular vein and examined using the buffy coat method (Paris et al., 1982). The packed cell volume (PCV) was determined after centrifugation.

The buffy coat of centrifuged blood was also extruded on a filter paper (Whatmann n°3) for PCR-analysis (Geysen et al., 2003).

Statistical Analysis.

Data were analysed using the logistic regression analysis. Use was made of the statistical package, Stata version 8.0 (Stata Corp., 2003).

Results

The parasitological examination gave negative results in all the 75 sampled animals.

However, a total of 13 trypanosomal infections (17.3%) were detected by PCR. The trypanosome species detected were *Trypanosoma congolense* (12) and *T. vivax* (1). The average PCV of the negative animals was 28.1 ± 3.9% and of the positive animals 27.6 ± 4.2%. Ten of the PCR-negative animals were anaemic (PCV≤ 24 %). Of the 13 PCR-positive animals, four had a PCV≤ 24 %.

The VA's diagnosed 32.5% of the PCR-positive cases as either trypanosomiasis or a combination of trypanosomiasis and another disease. The VA's also diagnosed 30.8% of the PCR negative cases as trypanosomiasis positive. There was no relationship between VA's diagnosis and the PCR results (P = 0.725). There was also no difference in diagnosis between the nine VA's (P = 0.8765).

Out of the total number of trypanosomiasis negative animals, the VA's assessed 45.7% as being in poor or very poor condition and 54.3% in good or excellent condition. The VA's assessed 45.8% of the trypanosomiasis infected animals to be in poor or very poor condition. There was no relationship between the VA's health assessment and the trypanosomal infection status (P=0.364). The relationship between VA's animal health assessment and the animal's PCV was, however, significant (P < 0.0001). On the other hand, the relationship between animal health assessment by the livestock owners and PCV was not significant (P = 0.105).

Discussion

In this study no infected animals could be detected using the parasitological diagnostic methods. This is not surprising considering the low sensitivity of parasitological diagnostic test for trypanosomiasis (Paris *et al.,* 1982). The latter is especially the case when the parasitaemia is low as is often observed during the chronic phase of an infection.

Although many animals were identified by the VA's as being infected with trypanosomes, the analysis shows that the capacity of the VA to clinically identify animals infected with trypanosomes is very low. This is again not surprising since animals infected with trypanosomes do not show pathognomic signs. Under field conditions such incorrect diagnosis are likely to result in a substantial proportion of unnecessary treatments with trypanocidal drugs. These findings clearly show the limited capability of the VA's in the provision of both preventive and curative services to the smallholders. Diagnosis of a common and important disease such as trypanosomiasis will only improve after basic diagnostic equipments such as a microscope, glass slides, sample collection bottles, etc.., are made available to the VA or a laboratory in the area where the VA is working.

Furthermore, inadequate coverage due to lack of transport limits the VA's delivery of diagnostic services and extension in disease control. Depending on the importance of the dip tank, VA's may have to cover areas between 8 to 20 km radius. Apart from few VA's who benefit from motorbikes and bicycles provided by previous livestock projects (*i.e.* SADC animal disease control and National livestock Development Project), most VA's do not have a reliable mode of transport.

Irrespective of the VA's diagnostic capabilities, their capacity to identify animals in poor condition seems to be satisfactory. This is reflected in the correlation between their condition score and the animal's PCV. This again reinforces the need for basic diagnostic equipment or diagnostic facilities. The VA seems indeed capable of identifying animals that are in poor condition but do not have the sufficient tools to identify the reason for this poor condition.

In conclusion, the study clearly shows the need for diagnostic facilities for the management of important livestock diseases such as trypanosomiasis. Relying on the assessment of, often experienced, veterinary staff in disease surveillance is likely to result in disease data of poor quality. This is certainly so for diseases with few pathognomic symptoms. The situation may improve by providing veterinary field staff with minimal diagnostic equipment and consumables and, if possible, promote the development of crush-side tests for the diagnosis of parasitic diseases such as trypanosomiasis.

who rendered technical support in various ways to support work and to all the Veterinary assistants and livestock owners who participated in this survey for their willingness and cooperation.

Lastly a hearty and very special thanks to my wife and family for their endurance, patience and encouragement.

References

Geysen D., Delespaux V. & Geerts S. 2003. PCR-RFLP using Ssu- rDNA amplification as an easy method for species –specific diagnosis of trypanosome species in cattle. *Veterinary Parasitology* **110:** 171-180.

Lefèvre PC., Blancou J., Dedieu L., Diallo A., Libeau G. & Thiaucourt F. 1993. Field diagnostic kits : a solution for developing countries ? *Revue scientifique et technique de l'Office international des Epizooties* **12 :** 451-460

Paris J., Murray M. & McOdimba F. 1982. A comparative evaluation of parasitological techniques currently available for the diagnosis of African trypanosomiasis in cattle. *Acta Tropica* **39:** 307-316.

Van den Bossche P., Shumba W. & Makhambera P. 2000. The distribution and epidemiology of bovine trypanosomosis in Malawi. *Veterinary Parasitology* **88:** 163-176.