The Prevalence of Bovine Trypanosomiasis in Song Local Government Area of Adamawa State, Nigeria

A. Ibn Zubairu, A. Midau, I.U. Dazala, M.M. Yahya and Z.M. Buba

1Adamawa State Ministry of Livestock and Normadic Education, Adamawa State, Nigeria
2Department of Animal Production, Adamawa State University, P.M.B. 25 Mubi, Adamawa State, Nigeria
3Federal University of Technology Yola, Adamawa State, Nigeria
4Department of Biological Sciences, Adamawa State University, P.M.B. 25, Mubi, Nigeria

Abstract: A survey was conducted in Song Local Government Area of Adamawa State on Trypanosomiasis in cattle between June and August, 2002, to ascertain the prevalence of trypanosomiasis. A total of 240 blood samples of different breeds, sexes and ages of cattle were collected from randomly selected herd and analyzed in laboratory using wet, thick, thin smear and Buffy coat concentration techniques. The infection rate was 26.67%. The prevalence obtained was 9.17% and 17.50% respectively of infected males and females.

Key words: Prevalence • Bovine • Trypanosomiasis • Nigeria

INTRODUCTION

Trypaliosomasis is the mine given to diseases which are caused by protozoa of the genus trypanosoma. There are large numbers of species in the genus and they are widely spread in nature. Almost all domestic animals, many wild species and man are affected by one or more of the trypanosomes.

Trypanosomiasis is a parasitic disorder in mammals that multiply in the blood stream, lymphatic vessels and tissues including the cardiac muscles and the central nervous system (CNS).

This infectious disease is virulent, incurable, but not contagious (except dourine, veneral trypanosome of equines). Trypanosomes are frequently found in the blood of various animal species in many regions of the world.

The organism are transmitted by tsetse flies Glossina species causing the trypanosomiasis which is characterized by parasitaemia, emaciation reduced productivity and frequently high mortality [1].

FAO [2] stated that tsetse flies (Vector of trypanosomiasis) infest approximately 10 million km² of Africa, representing 37% of the total continental land mass affecting 37 countries. It is considered that 7 million km² of this area could otherwise be suitable for livestock and mixed agriculture without stress to the environment if trypanosomiasis could be controlled. The limited data available indicates that the area infested with the tsetse flies has been increasing steadily since the 1950’s [3].

There are about 30 species of Glossina which are capable of transmitting trypanosomes, 11 of which are known to occur in Nigeria infesting 80% of Nigeria surface area and all are known to be vectors of trypanosome species infectious to domestic animals [4]. The most common species in Northern Nigeria are Glossina palpalis, Glossina tachnoides these species are associated with riverine, wood vegetation and stream areas. While Glossina Morsitans, Glossina Longipalis are associated with Savannah regions.

But despite the absence of the biological vector in the Sahel savannah vegetation zone, sporadic outbreaks have been reported in the area Nawathe et al. [5].

The annual bulletin of National Institute of Trypanosomiasis Research (N.I.T.R) indicated the presence of Glossina species in many states of the country including Adamawa State. This shows that the disease is prevalent in the state.
This study will provide information on the rate of infection of the disease in Song Local Government Area. This will help livestock owners, animal health workers and policy makers in readdressing the issue of losses in productivity due to the disease. The objective of the research was to ascertain the prevalence of trypanosomiasis in the study area.

**MATERIALS AND METHODS**

**Sampling:** A total of two hundred and forty blood samples was collected from three different breeds of cattle (Adamawa Gudali, white Fulani and Red Bororo) in Song Local Government of Adamawa State and analyzed. Blood was generally collected from the jugular vein. The hairs were clipped; the skin cleansed with spirit and the vein was distended by a thumb pressure on it. A 21mm gauge hypodermic needle was used to pierce the distended vein with the point towards the head of the animal. Through the needle about 5 ml of blood was collected into the McCartney bottle containing EDTA (Anticoagulant). The blood was then mixed with the anticoagulant carefully and gently by turning the bottle round and round. Then it was transported to the laboratory at Kofare for analysis.

**Wet Film Preparation:** A drop of blood was placed at the middle of a clean, dry and grease-free slide. Using the tip of the dropper the blood was spread to about 2mm in diameter on the slide and that over flow was avoided, it was then covered with a cover slip and examined two hundred fields under electric microscope using x10 and x25 eye piece objectives [6].

**Thick Film Preparation:** A drop of blood was placed at the middle of a clean, dry and grease-free Microscope slide and a thick film was produced by the use of the corner of another slide. The film was rapidly dried in air by waving, then placed in distilled water for 5 minute to dehaemoglobinise and stained in a 10% Giemsa for 30 seconds. Oil immersion was applied on the film and two hundred fields were examined under light microscope using x10 and x25 eye piece objectives [6].

**Thin Film Preparation:** A drop of blood sample was placed at one end (about 1cm to the end) of a clean, dry and grease-free glass slide placed horizontally on the table. A flat and smooth edge of another slide was placed at about 30° on the horizontal slide and pulled backward to get in contact with the blood and a little pause was done to allow the blood to spread along the edge of it, then it was pushed forward fast and once at that angle hence a thin film was produced. It was then dried in air and fixed in methanol for 3 minutes. After fixing, it was stained in 10% Giemsa for 30 seconds, oil immersion was applied and two hundred fields were examined under light microscope using x10 and x25 objectives [6].

**Buffy Coat Concentration Technique:** About ¾ of heparinized capillary tube was filled with blood sample and one end was sealed to avoid splashing in the course of centrifuging. It was then placed in a hematomctrit centrifuge and centrifuged at 12,000rpm for 4 minutes.

The hepaninized capillary tube was taken out and the supernatant was poured onto a clean, dry grease-free glass slide by and examined two hundred fields under light microscope using x10 and x25 objectives [6].

**RESULT AND DISCUSSION**

The prevalence of trypanosorniasis in Song Local Government has not been a surprise thing as it had been reported by some scholars that the vector Glossina are found in many states of the Federation including Adamawa State. Also Trial et al. [7] reported that the species covered at least 20% of the Northern states. Despite transmission of the trypanosomiasis by tsetse flies, Radostite et al. [8] reported that trypanosomes have been introduced into a herd in the absence of Glossina spp by biting flies through feeding on more than one host within a short interval of time and also through needle during inoculation. To this end, it is clearly known that even without tsetse fly in the area the animals may come down with the disease in one way or the other.

The degree of susceptibility to trypanosomiasis varies with age, [9]. Table 1 show that older and younger animals are more susceptible with an infection rate of 16.67% and 12.20% respectively. In older animals their degree of susceptibility would be connected with the fact that their immune systems for defense have started wearing out making them prone to infection while on the other hand the young ones are also susceptible perhaps they have not developed the necessary immune system yet.

From the analysis of an overall infection rate of 13.33% infecting 32 animals out of the 240 samples collected. The 13.33% of prevalence of trypanosomiasis in the local government area was found to be lower in other parts of the country and higher than in other parts. Ardo et al. [9] reported that there was 29.5% infection rate in Takum and Donga local government areas of Taraba.
Table 1: Prevalence of Trypanosomiasis based on Age

<table>
<thead>
<tr>
<th>Age of animal examined</th>
<th>Number of animals examined</th>
<th>Number of animal positive</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months -2 years</td>
<td>82</td>
<td>10</td>
<td>12.20</td>
</tr>
<tr>
<td>3-5 years</td>
<td>62</td>
<td>6</td>
<td>9.68</td>
</tr>
<tr>
<td>6 years and above</td>
<td>96</td>
<td>16</td>
<td>16.67</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>32</td>
<td>38.55</td>
</tr>
</tbody>
</table>

State, 2% infection rate in Ridam village near Miango in Bassa Local Government Area of Plateau State [8]. This shows that the infection rate in Song local government area of Adamawa State is higher than that in Ridam village and lower than the one in Takum and Donga local government areas. These variations could perhaps be due to differences in location and management system as observed by Ardo et al. and Hunter [9 & 10].

When the analysis was carried out two species of trypanosome were identified, *Trypanosoma vivax* and *Trypanosoma congolence*. This finding has been in line with the report of Leaflang et al.[11], that in Nigeria, *Trypanosoma vivax* and *Trypanosoma congolence* cause serious economic damage to livestock industry. *Trypanosoma vivax* was recognized by its very fast movement in wet films, it’s long, slender with a rounded posterior end and a long free flagellum and a terminal Kinetoplast. While *Trypanosoma congolence* was recognized by its sluggish movement in wet films, short, with a marginal Kinetoplast with no free flagellum and often adheres to red blood cells by the anterior end as reported by Radostits et al. [8]. The infection rate for *Trypanosoma vivax* was 9.17% infecting 22 animals out of the 240 samples collected while *Trypanosoma congolence* infected 10 out of the 240 sample examined with an infection rate of 4.16%. The higher infection rate of *Trypanosoma vivax* may be due to their short life cycle approximately one week and that they are most often transmitted mechanically as reported by Radostits et al. [8].

CONCLUSION AND RECOMMENDATIONS

The prevalence and devastating role of Trypanosomiasis and its influence on livestock industry generally has been examined. In terms of its influence on the economy, it is urgent that the disease be controlled to minimize economic losses.

In view of this, the authors suggest the followings as recommendable steps to be followed as to attain to these goals;

- FAO (Food and Agricultural Organizations) and other collaborating institutions should seek means to advance studies into the socio-economic aspects of trypanosomiasis proposing that socio-economic surveys be carried out in areas where such development programmes as introduction of trypanotolerant livestock, tsetse control campaigns or development of veterinary care are being launched.
- Research on trypanosomiasis should continue to receive priority in financial allocation, to focus attention in sites where studies can be carried out and provide financial support to such centers, the mobilization of large-scale financial and technical support for future long term activities in the field of trypanosomiasis research.
- Training courses on field techniques for the diagnosis of animal trypanosomiasis and the evaluation of the trypanosomiasis risk be organized on a sub-regional basis.
- Present evidence would appear to indicate that trypanotolerance is hereditary and higher levels of tolerance could be gained by selective breeding. Levels of tolerance which may be attained could be determined by casual selection in programmes aimed at measuring genetic response. Correlation of genetic responses in selective breeding programmes in areas of uniform Trypanosomiasis risk would be a practical approach to attaining higher levels of tolerance. Incorporating such breeding programmes in large scale production operations could assist in accelerating acquisition of superior breeding stock.
- Reactivation of mass eradication of tsetse fly a vector of Trypanosomiasis by the Federal Government by spraying of insecticides on bushes and forests habitats for the vectors.

REFERENCES


