

Brief Research Report

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Volume 1 : Issue 1

Article Ref. #: 1000EPOJ1103

Article History

Received: September 14th, 2015

Accepted: March 7th, 2016

Published: March 9th, 2016

Citation

Garcia GC, de Moura DM, Frange RCC, Bitta ER, Bittar JFF. Bovine trypanosomiasis: retrospective investigation and clinical signs. *Epidemiol Open J.* 2016; 1(1): 16-19. doi: [10.17140/EPOJ-1-103](https://doi.org/10.17140/EPOJ-1-103)

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Bovine Trypanosomiasis: Retrospective Investigation and Clinical Signs

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ABSTRACT

Trypanosoma vivax is a protozoan that causes Bovine trypanosomiasis. Originally from Africa, the disease has become common in other countries. Bovine trypanosomiasis is a disease underdiagnosed in many parts of the world, including Brazil. The lack of knowledge regarding this protozoan is a factor that contributes to the rapid spread of the disease. Many losses are attributed to the disease, including death of animals. This study aimed to perform a retrospective investigation of cattle with *T. vivax* that had blood samples forwarded to Veterinary Hospital of Uberaba-Brazil by performing the *Buffy coat* technique. The collected data showed that in 285 suspected animals, that had samples submitted to Hospital Veterinário de Uberaba, 17.54% were positive. Separating in gender, females had 22.37% of positivity rate and males 2.13%, which is explained by the handling of the animals where handlers are able to see signs of the disease and decreased milk production, besides the use of the same needle for oxytocin application before milking that spreads the disease for many animals in a short period of time. The biggest prevalence among ages was seen in animals between 1 to 12 months (35% of positivity) and 12 to 24 months of age (61.64% of positivity), possibly because of the immune system development, younger animals do not have immunity to the disease. The breed that most showed positivity was Holstein dairy breed (100%). The opportune diagnosis of *T. vivax* is an important finding since the disease leads to large losses in cattle ranching and prejudices the economic system.

KEYWORDS: *Trypanosoma vivax*; Bovine trypanosomiasis; Diagnostic; *Buffy coat*.

INTRODUCTION

Bovine trypanosomiasis is a parasitic disease caused by *Trypanosoma (Duttonella) vivax* that mainly affects ungulates, including cattle, sheep, goats, horses, camels and various species of wild antelope and buffalo.^{1,2}

In West Africa, *T. vivax* is an important and pathogenic trypanosome in cattle, being a significant disease to animal breeding transmitted by the tsetse fly (*Glossina* spp). In Latin America, mechanical vectors transmit the parasite.^{3,4} In Brazil, *T. vivax* was first identified in a buffalo in Pará state, subsequently to an outbreak of trypanosomiasis in Pantanal affecting 10 of 29 head of cattle.

Symptoms depend on the degree of the disease.⁵ Often is observed hyper acute infection, characterized by severe anemia, bleeding in mucous surface and thrombocytopenia arising.⁶ Acute infection, which generates septicemia with fever and marked parasitemia two weeks after infection, may result in death.⁷ It is possible to find ecchymotic hemorrhages,⁵ intermittent fever, swollen lymph nodes, tachycardia, poor body condition, decreased fertility,^{8,9} leukopenia, watery eyes, progressive weakness, abortions⁹ and anemia without hemoglobinuria.⁵

Observing fresh blood under microscope is a direct method adequate to diagnose the acute disease.⁵ In contrast, the chronic phase of the disease is diagnosed by detection of antibodies against *T. vivax* using the indirect immunofluorescence.^{10,11}

This study aimed to perform a retrospective investigation of cattle with *T. vivax* in Veterinary Hospital of Uberaba-Brazil.

MATERIAL AND METHODS

A retrospective study was performed with 285 bovine from Uberaba (152 animals), Prata (90 animals), Pirajuba (20 animals), Campo Florido (7 animals), Veríssimo (6 animals), Comendador Gomes (4 animals), Monte Alegre de Minas (3 animals), Frutal (2 animals) and Coromandel (1 animal) that had samples forwarded to Hospital Veterinário de Uberaba from May, 2012 to September, 2013. The animals were separated according to gender being 47 males, 219 females and 19 did not have specified gender. The bovines also had different breeds, being Holstein (4 animals), Gyr (8 animals), Girolando (180 animals) and undefined cattle breed (93 animals). In addition, the animals were also separated according to ages.

The protozoan was detected by *Buffy coat* technique that consists in centrifuging the blood to be analyzed in a closed hematocrit micro tube. After centrifugation, the tube is broken between cellular and liquid part and a small portion of material is deposited on the slide, according to the technique described.¹¹ The slides were stained with Quick Panoptic® kit and visualized in an optical microscope at 100X objective with immersion oil. The animals were considered positive when was possible to observe trypomastigote form (Figure 1). The data were analyzed by descriptive statistics.

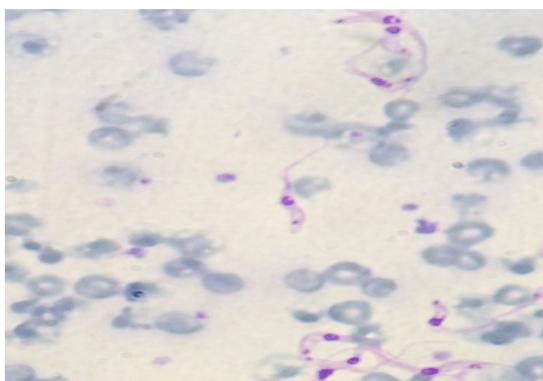


Figure 1: Positive animal for *Trypanosoma vivax* using smear made by *Buffy coat* technique (trypomastigote form). 100X magnification stained with quick Panoptic®.

RESULTS AND DISCUSSION

The Triângulo Mineiro region is located in state of Minas Gerais – Brazil. This region is one of the most important sites for the production of cattle and exports genetic material to

different places around world and there is little study about this parasitosis in Minas Gerais state.

The *T. vivax* occurrence in different months of the year is shown in figure 2. The protozoan epidemiology is directly related to the rainfall period.^{4,11,12} Recent studies¹³ analyzed the positivity percentage of animals from Uberaba found 16.2% of positivity when searching for antibodies anti-*T. vivax*, value that was near to what was found in the present study.

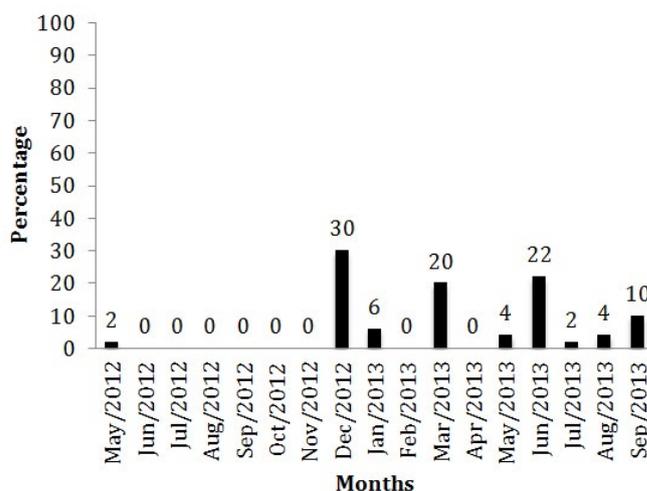


Figure 2: Percentage of positive and negative animals to *T. vivax* in different months.

Males showed 2% (1) positivity, lowered when compared to females 98% (49) (Figure 3A). The highest *T. vivax* occurrence in females is explained firstly because of the stress to which they are submitted,¹⁴ i.e. Gestation, lactation, and secondly because females are more likely to contamination with fomites i.e. when the same needle is used for many animals in application of medication such as oxytocin before milking.

When the *T. vivax* occurrence in the region of Uberaba and adjacent regions was studied,¹³ was shown that in 91.6% of positive properties for *T. vivax* the needle exchange between animals while administrating drugs was not done.

In the present study Girolando animals had 72% (36) positivity followed by not specified breeds 16% (8), Holstein breed, which had 8% positivity (4). Gyr breed had 4% (2) positivity (Figure 3B). The first trypanosomiasis report in dairy herd for the southwest region was described in recent studies¹⁵ in the state of São Paulo, reporting animals breed Holstein and Girolando. In the state of Minas Gerais the first report was done in 2008.¹⁶ Other breeds were described with infection such as Brahman.¹⁷ Some breed developed what is called trypanotolerance, which is the resistance to the infection and keep in the condition of asymptomatic carrier.¹⁸

The fact that the animals from the present study are in the most part dairy cattle is because the region of Minas Gerais is a pole in milk production, having big dairy herds and being the

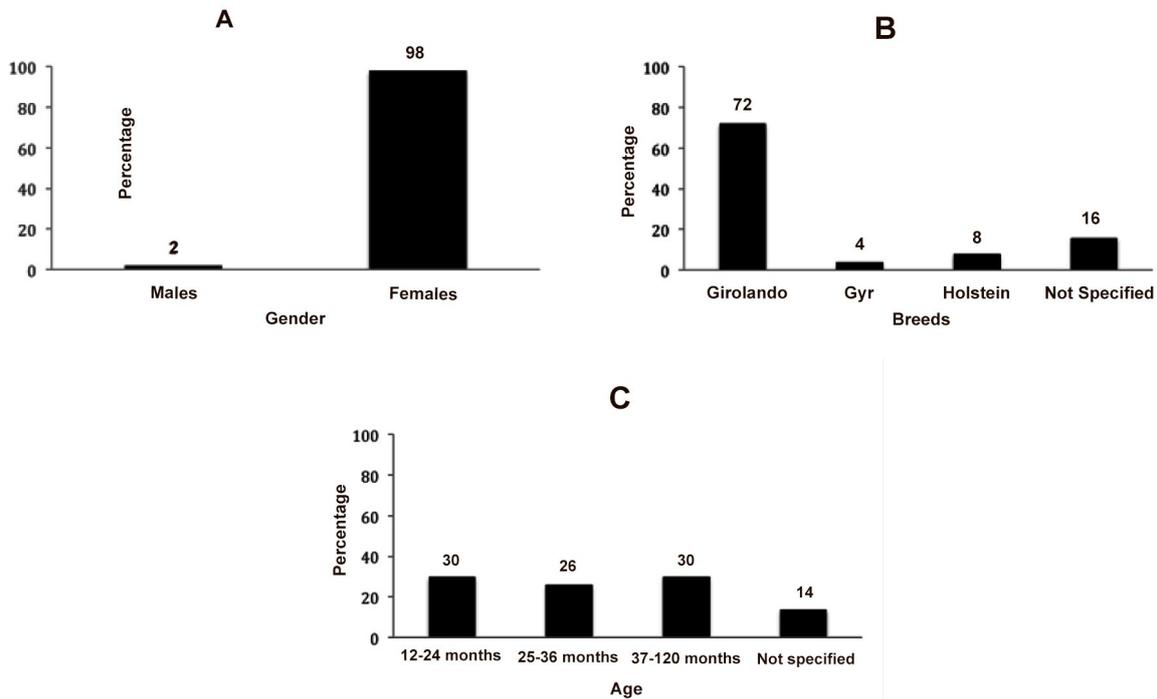


Figure 3: A - Percentage of positive and negative animals to *T. vivax* in males and females; B - Occurrence of positive animals for *T. vivax* among the different breeds; C - Percentage of positive animals among different ages.

main state in milk production in Brazil.¹⁹

The diagnosis in dairy cattle is easier, once the milk production is hampered,⁴ being promptly noticed for those who are handling the animals daily.

The animals were separated in groups according the age, being 30% (15) older than 12 months, 26% (13) between 25 to 36 months, 30% (15) between 37 to 120 months and 14% (7) did not have the age identified (Figure 3 C).

The resistance to the protozoan besides other factors can vary with age.¹⁴ This could be explained because younger animals do not have developed immunity to the pathology, being the first contact within the first months of life, what lead to acute cases that were detectable to the *buffy coat* method.

It is important to emphasize that the *Buffy coat* technique allows detecting circulating parasite, i.e., in the acute phase or when the animal undergoes immunosuppression. Much of infections in cattle from endemic areas tend to be chronic course and not always fatal.²⁰

In South America, *T. vivax* transmission is mechanical. This work shows that even without the presence of the tsetse fly, there are bovine trypanosomiasis cases in Brazil, with severe symptoms attributed mainly to *Tabanidae*. In addition, the mechanical transmission by fomites is relatively easy. Brazil is an important pole in the production chain of animals. For this reason attention should be taken aiming the control of this agent in farms of the country.²¹

CONFLICTS OF INTEREST: None.

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