Clinical Parameters of Goats Experimentally Infected with 
*Trypanosoma Vivax*

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Abstract: This experiment was carried out of sixteen local breed goats, aged 9-12 months weighing 14-18 Kg. They were divided into control and infected groups (eight of each). The infected group was inoculated with *T. vivax* (DRSS06) strain, which was isolated from tsetse area. Blood was collected from all animals daily for parasites detection and haematological examination. The study revealed that, this strain caused a severe change in blood haemoglobin concentration and clinical parameters, with prepatent period of 4-7 days. The first peak of parasitaemia appeared on day 7 post infection (p.i) then, the mean of parasitaemia (log₁₀ 4.4± 1.5 parasites/mm³) levels persisted without apparent remission until the end of experiment (seven weeks). Haemoglobin concentration value was decreased steadily until the week 7 p.i. It reached 3.5±0.2 mg/dl. Body temperature was found to be increasing coincided with the parasitaemia showed levels of 39.8±0.5 °C at week 7(significant at p>0.01 as compared with the controls. Pulse rate was increased with slight fluctuation showed levels of 144.6 ± 27 beats/min at week 7. Respiratory rate was increased showed levels of 45±1.4 breath/min at week 7 p.i. pulse rate and respiratory rate significantly increase (p>0.01). The main clinical signs exhibited by infected animals were anaemia, pale mucous membrane, weakness, slight diarrhea, nervous signs, ear oedema, loss weight, pyrexia, emaciation and abdominal pain.

Index terms: Trypanosomes. PCV, Haemoglobin, Goats, Tsetse area, Sudan.

I. INTRODUCTION

Trypanosomosis is a disease of man and animals. It is caused by single-celled protozoan parasites of the genus *Trypanosoma* [1]. *Trypanosoma vivax* is a primary parasite of the invertebrate hosts, adapted herself to live in the blood and tissues of the vertebrate hosts, leading to many changes in their constituents [2]. It is transmitted cyclically through tsetse flies of the genus *Glossina*, and mechanically by haematophagus flies [3]. Anaemia is the main feature of the disease. The disease is associated with a rapid decline in packed cell volume (PCV %), and Haemoglobin concentration (Hb) levels were significantly decreased when compared with the control (p>0.01). The clinical parameters such as body temperature, pulse rate and respiratory rate are increased due to infection with trypanosomes [4]. In trypanosomosis there is good appetite in spite of high fever [5]. This paper is a part of study on the pathogenesis of *Trypanosoma vivax* in goats. Here we want to notice the effective of parasitaemia caused by *T. vivax* on the clinical parameters, PCV and Hb concentration and some clinical signs.

II. MATERIALS AND METHODS

Experimental Animals and Study Design

Sixteen Nubian goats aged 9-12 months, and weighed 14-18 Kg were purchased from local markets. They were housed in a fly-proof barn. All animals were housed at the College of Veterinary Medicine and Animal Production, Sudan University of Science and Technology (CVMAP/SUST). They were supplied with limited concentrate, grain Sorghum stalks. Water and minerals were provided *ad libitum*. All animals were carefully examined for blood parasites, internal and external parasites. Supportive treatment was induced. The experimental goats of the study were divided at random into two groups; eight supposed to be infected and eight non-infected controls. The group one was inoculated intravenously with 1 ml 5x10⁵ *T.vivax* (DRSS06) of the infected blood initially derived from the donor goat.
Blood Sampling
Two ml blood was collected from the jugular vein in containers with EDTA for parasitological and haematological investigation. All experimental animals, both infected and control were examined daily (seven week) for the following:

Clinical observations
All infected animals were being inspected in any visit during the experimental period for any changes and clinical signs.

Levels of parasitaemia and body temperature
Parasites were estimated, using the wet film parasite count method [6]. Then the titre was calculated as log 10. Rectal temperature was daily recorded in the morning from all experimental animals. General body condition and others clinical changes were recorded.

Haemoglobin and PCV concentration examinations
Hb was estimated by oxyhaemoglobin method [7]. The PCV was centrifuged in haematocrit centrifuge (SH-120, Shanghai Surgical Instrument Factory) Table was done to estimate Hb and PCV of the experimental animals daily through the experiment.

Clinical parameters
Pulse rate was taken from femoral artery per minute. Respiratory rate was count by using stethoscope from the chest, daily at morning throughout the experiment.

III. RESULTS AND DISCUSSIONS
The clinical effect of the infection compared with the control animals is presented in table 1.

Clinical signs and general condition
The animals showed dullness, grunting teeth; this sign disappeared and appear with high parasitaemia and high temperature. There was slight soft diarrhoea. The animals were weak and with slow movement in the barn, some of them lay down, recumbent completely with hind limb paralysis and convulsion, there were abdominal pain, ear oedema. The animals showed emaciation, lethargy, good appetite, rough coat and whitish anaemic mucus membrane. There was labored breathing increased in depth of respiration without much increase of the rate.

Table 1. Mean ±SD of parasitaemia and clinical parameters of goats Infected with T. vivax

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Animal</th>
<th>Wk0</th>
<th>Wk1</th>
<th>Wk2</th>
<th>Wk3</th>
<th>Wk4</th>
<th>Wk5</th>
<th>Wk6</th>
<th>Wk7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parasitaemia (log 10)</td>
<td></td>
<td>0</td>
<td>2.3±2.1</td>
<td>3.2±2</td>
<td>4±0.9</td>
<td>3.4±0.7</td>
<td>3.5±1.3</td>
<td>3.7±0.4</td>
<td>4.3±1.5</td>
</tr>
<tr>
<td>Body temp.°C</td>
<td></td>
<td>cont</td>
<td>38.7±0.4</td>
<td>38.5±0.2</td>
<td>38.8±0.3</td>
<td>38.7±0.3</td>
<td>38.8±0.5</td>
<td>38.9±0.4</td>
<td>38.2±0.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>infect</td>
<td>38.6±0.7</td>
<td>39.5±0.9</td>
<td>39.4±0.7</td>
<td>39.5±0.4</td>
<td>39.5±0.4</td>
<td>40±0.4</td>
<td>40.2±0.2</td>
</tr>
<tr>
<td>P.R Thrill/min</td>
<td></td>
<td>cont</td>
<td>71±1.8</td>
<td>62.9±7.6</td>
<td>70±14</td>
<td>67±12.8</td>
<td>66±8.5</td>
<td>70.3±0.5</td>
<td>70±0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>infect</td>
<td>71±6.5</td>
<td>71.2±11.2</td>
<td>88.6±12.5</td>
<td>115.3±1.8</td>
<td>120±15</td>
<td>115±10</td>
<td>120±10.1</td>
</tr>
<tr>
<td>R. R /min</td>
<td></td>
<td>cont</td>
<td>34±5.9</td>
<td>34.9±6.5</td>
<td>31.9±2.9</td>
<td>29±3.9</td>
<td>29.7±9.6</td>
<td>29.5±7.8</td>
<td>29±7.1</td>
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<td></td>
<td>infect</td>
<td>36±5.3</td>
<td>33.6±11.3</td>
<td>33.2±5.4</td>
<td>34.5±3.8</td>
<td>35.7±2.1</td>
<td>42.9±8.6</td>
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<td>Hb g/dl</td>
<td></td>
<td>cont</td>
<td>9.3±5.5</td>
<td>8.1±0.2</td>
<td>8.3±0.2</td>
<td>8±0.4</td>
<td>7.9±0.2</td>
<td>7.9±0.1</td>
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</tr>
<tr>
<td></td>
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<td>infect</td>
<td>9.3±0.6</td>
<td>8.4±0.8</td>
<td>6.4±0.8</td>
<td>4.9±1</td>
<td>4.8±0.5</td>
<td>4.3±0.5</td>
<td>3.6±0.2</td>
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<tr>
<td>PCV %</td>
<td></td>
<td>cont</td>
<td>24.8±3.8</td>
<td>22.1±0.8</td>
<td>23±0.9</td>
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<td>21.8±0.7</td>
<td>20.8±0.6</td>
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<td></td>
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<td>infect</td>
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<td>24.6±2</td>
<td>18.8±2.3</td>
<td>14.2±2</td>
<td>1±12.2</td>
<td>0.7±11.5</td>
<td>0.9±10.2</td>
</tr>
</tbody>
</table>

* means the probability is significant at p>0.05. ** means the probability is significant at p>0.01.
In this study, the experimental infection with *T. vivax* (DRSS06) caused severe disease with incubation period of 4 to 7 days. This agreed with [8], but in contradiction with [9]. The high parasitaemia observed coincided with high level of body temperature was in accordance with [10], and [8] but in contradiction with [11] and [12]. However, [5] noticed that there is no good correlation between the changes in the temperature during fever and levels of parasitaemia in goat infected with *T. vivax*. However, the increased of heart and respiratory rates observed in goats in this study are similar as that reported by [4] and [13]. In accordance, with [5] they did not notice any changes in heart rate in goat infected with *T. vivax*.

Anaemia is the principal pathological feature of animal trypanosomosis [14, 15]. The severe anaemia reported in this study was evident by the decrease of Hb and PCV this agreed with[16]. Moreover, the coinciding reduction of RBCs with the increased number of the parasites in the blood, this agreed with [2, 17, 18]. Therefore, the decreased levels of Hb and PCV, and increased levels of clinical parameters coincided with high parasitaemia in goats during trypanosomosis infection in this study signified a correlation with the severity of the disease observed in these animals.

The main clinical signs shown in this study are fever, emaciation, anaemia, coughing, diarrhoea collapse and death. This is in agreement with [2] and [12]. The nervous signs observed in this study agreed with [19]. In conclusion, it has been shown that goats’ trypanosomosis due to *T. vivax* (DRSS06), which is isolated from tsetse belt, affects greatly the blood haemoglobin and PCV of the animal as well as its clinical parameters and body temperature.

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IV. REFERENCES


