Distribution of Babesiosis among Human and Cattle in Baquba City

Safa Ibrahim Jaber
College of Health and Medical Techniques, Middle Technical University Baghdad, IRAQ.

Corresponding Author: safaibrahim@mtu.edu.iq

ABSTRACT
In this study, 30 specimens blood were collected from cattle infected with Babesiosis and 30 blood samples were taken from humans infected with Babesiosis too. Also, 15 blood samples were taken from healthy cattle and 15 blood samples were taken from healthy individuals as control groups. The samples were collected from the cattle at the veterinary clinic in Baquba city-Iraq. While human samples were collected from Al-Razi Hospital in Diyala Province during the period from May to December 2023. The results showed that the middle standard of acute Babesiosis in the cattle was higher than humans Babesiosis with no important variations, \( P=0.36 \). While the middle standard of chronic Babesiosis in the cattle was high in comparison to Babesiosis in man with height important variations, \( P<0.001 \). The middle standard of acute Babesiosis in humans was high in comparison to the healthy individuals with height important variations, \( P<0.001 \). However the chronic Babesiosis was high concentration compared to the healthy individuals, \( P<0.001 \). Furthermore the acute Babesia infection was high level compared to the healthy peoples, \( P<0.001 \). Also the chronic babesiosis in cattle was high level in comparison to the healthy group, \( P<0.001 \). But that no moral variation among age groups and distribution sites among infected human.

Keywords- Babesiosis, Human, Cattle, Diyala Province.

I. INTRODUCTION

Babesia is a parasite that invades the blood cells [1]. In terms of animal’s health, particularly in production livestock, babesiosis is related to economic losses due to animal mortalities, low production and the need to clinical treatments [2]. Based on some agents such as stress, babesiosis exhibits variable non-pathognomonic symptoms in cattle [3]. The antibodies are transmitting from mothers to bairn, and animals may become chronic infection carriers or even die [4]. Babesia bigemina and Babesia bovis were detected in cattle farms in Colombia and Rhipicephalus microplus is the tick that transmits them. Lxodes ricinus in Europe and Lxodes scapularis in the USA are the vectors that are shown to transmit Babesia species to humans to date [5][6]. Babesiosis symptoms; fatigue, fever, malaise, abdominal pains, nausea, arthralgia, anorexia, haemolytic anemia [7], hemoglobinuria, with haematuria, that may be cause death in spleenectomized people. Because of the signs and symptoms are similar, a healthcare professional usually misleads and suspects other infections [8]. In certain livestock production parts of Colombia, researches on human babesiosis usually use serological approaches or microscopy to identify the parasite in the blood [9].

These findings in Colombia indicate that there is an exposure to the parasite in such livestock production areas [10]. It emphasizes the significance of carrying out more exhaustive microbiological investigations, such as molecular analysis to animals and humans for assessing the circulation of this parasite [11]. The aim of the current study was to identify the incidence of Babesiosis in cattle, and humans in Diyala Province.

II. MATERIALS AND METHODS

Thirty blood specimens were collected from cattle infected with Babesiosis and 30 blood specimens were taken from humans infected with Babesiosis too. Likewise, fifteen blood samples were taken from healthy
animals (cattle), and fifteen blood specimens were taken from healthy individuals as control groups. The specimens were collected from the cattle at the veterinary clinic in Baquba city-Iraq. While human samples were collected from Al-Razi Hospital in Diyala Province during the period from May to December 2023. The blood samples were centrifuged after clotting for 15 minutes at 300 rpm to obtain serum samples. The serum samples were used for IgM and IgG antibody detection by the enzyme linked immunosorbent assay (ELISA) test. ELISA testing depends on the qualitative enzyme immunoassay method.

Statistical analysis:

For data analysis, SPSS-20 program was used, i.e. t-test and (Mean±S.D). The p<0.05 value is considered as significant.

III. RESULTS

The middle standard with acute Babesia in the cattle was higher than humans Babesiosis with no important variations, P= 0.36. While the chronic phase Babesiosis in the cattle was high in comparison to chronic Babesiosis in humans with height important variation P<0.001, table 1.

Table (1): Prevalence of Babesiosis antibodies among cattle and man

<table>
<thead>
<tr>
<th>Parameter</th>
<th>cases</th>
<th>Middle standardization</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgM</td>
<td>In man</td>
<td>2.02±0.20</td>
<td>0.36 NS</td>
</tr>
<tr>
<td></td>
<td>In Cattle</td>
<td>2.32±0.25</td>
<td></td>
</tr>
<tr>
<td>IgG</td>
<td>In man</td>
<td>1.71±0.15</td>
<td>&lt;0.001 **</td>
</tr>
<tr>
<td></td>
<td>In Cattle</td>
<td>14.48±1.31</td>
<td></td>
</tr>
</tbody>
</table>

** Significant differences

The middle standard of acute Babesia in in man was high in comparison to the healthy individuals with a highly important variations P=≤0.001. While the chronic phase Babesiosis in man was high too in comparison to the healthy group, with height important vibrations, P=≤0.001 as shown in table (2).

Table (2): Prevalence of Babesiosis man in comparison to the healthy

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Cases</th>
<th>Concentrations</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute phase</td>
<td>Healthy</td>
<td>0.10±0.04</td>
<td>&lt;0.001 **</td>
</tr>
<tr>
<td></td>
<td>Patients</td>
<td>2.02±0.20</td>
<td></td>
</tr>
<tr>
<td>Chronic phase</td>
<td>Healthy</td>
<td>0.10±0.04</td>
<td>&lt;0.001 **</td>
</tr>
<tr>
<td></td>
<td>Patients</td>
<td>1.71±0.15</td>
<td></td>
</tr>
</tbody>
</table>

** Significant differences

Table (4) showed that the middle standard of acute Babesia in man (Male) was less than female, with no important variations P=≤0.76. While the chronic phase in males was less than females with no important variations P=0.81.

Table (5) showed that the middle standard of acute Babesia of man in the ages (≤30) was (1.94±0.29), while in the ages (≥30) was (2.08±0.27), with no important variations P=≤0.75. In addition, the middle standard of chronic phase Babesiosis of man in the ages (≤30) was (1.49±0.17), while in the ages (≥30) was (1.85±0.22), with no important variations P=0.25.

Table (6) showed that the middle standard of acute phase of man in rural areas was high, while in urban areas was low, with high important variations.
P<0.001. Also, it was shown that the middle standard of chronic phase Babesiosis of man in rural areas was higher than urban areas, with high important variations P<0.001.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>geographic area</th>
<th>Concentrations</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgM</td>
<td>Rural</td>
<td>2.92±0.29</td>
<td>&lt;0.001**HS</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>0.13±0.27</td>
<td></td>
</tr>
<tr>
<td>IgG</td>
<td>Rural</td>
<td>2.72±0.18</td>
<td>&lt;0.001**HS</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>0.70±0.25</td>
<td></td>
</tr>
</tbody>
</table>

NS= Non-Significant

### IV. DISCUSSION

Babesiosis is a zoonotic disease, it is caused by a bloody parasite that is transmitted from animals to humans via a vector, which is ticks. The results showed height important vibrations between the cattle and humans in acute phase of the disease. The acute phase in cattle was high in comparison to acute phase in man, P= 0.36. Bastos, et al, (2022) showed that there is a convergence of acute infections with Babesia between cattle and humans because they are in direct contact with animals, and most rural people who keep cows are exposed to the bite of the tick that is spread on infected animals [12]. While in chronic phase of Babesiosis between cattle and human, there was a height important vibrations, the acute phase in man was high in comparison to the healthy individuals, P=<0.001. These findings agreed with (Azhar, et al, 2023) who concluded that there is a highly significant difference in Babesia infections between animals and humans in the chronic phase because animals are the main host for this parasite, so the infection takes hold in them. Likewise, infected humans may resort to traditional treatments used against malaria [13]. The middle standard of acute Babesia infection in man was high in comparison to the healthy group with a height important variations. Also, the chronic Babesiosis man was high in comparison with the controls with a highly important variations P=<0.001. Svenssson, et al, (2019) revealed that there is a high increase in levels antibodies in patients with Babesia that are exposed to tick bites [14]. Also, there are high differences between infected and healthy Cattle with Babesia compared to the healthy individuals. These results chimed with (Fesseha, et al, 2022) which is clear that there was a widespread seroprevalence of antibodies against Babesia in the sera of cows infected with this Hemo- parasite in Ethiopia [15]. Regarding human Babesia infections, there were no significant differences between ages and no differences between genders. Montero, et al, in Spain, after serological tests, found that there were no differences between age groups, and there were also no differences between males and females in terms of the distribution of infections [16,17,18]. The acute Babesiosis of man in rural area was high, while in urban area was low with a highly important variations, P<0.001. Also, the chronic Babesiosis of man in rural area was high in comparison to urban area, which were low with high important variations, P<0.001. This is what Evan, et, (2019) stated. There are high differences between infections in rural areas compared to urban areas in infections with Babesia. The reason is clear because the countryside has an abundance of animals and is close contact to residential areas in which farmers and livestock breeders live, especially areas that lack health culture, community awareness and hygiene [19, 20].

### V. CONCLUSIONS

According to the results, there was a wide spread of Babesia infections among cows and humans in rural areas compared to urban areas in Diyala Provence.

### REFERENCES


