Prevalence of *Babesia bovis* in cattle in Tikreet city and its surroundings with hematological study

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Abstract

This study included the detection of infection with Babesia bovis in cattle in Tikreet city and its surroundings. Ninety seven blood samples were taken from cattle and covered various random ages ranged between 6 months and 4 years. The results revealed that the rate of Babesia bovis infection was 8.8%. The most observed transmission occurred in summer and autumn months and ceased in winter. Amongst aged subsets of host population *Babesia* bovis generally infected older hosts.Hematological studies revealed a significant decrease in hemoglobin concentration in babesiosis positive animals as compared to negative control. These records may be considered the first in Tikreet city, Salahedeen governorate.

Introduction

Bovine babesiosis caused by Babesia bovis is a common tick-borne disease in tropical and subtropical regions[1]. Although they often only cause sub-clinical disease, they have a considerable economic impact on the livestock industry of developed and developing countries [2], which is characterized by high fever and intravascular haemolysis, leading to anaemia, icterus. haemoglobinurea and death [3]. Babesiosis was recorded in various domestic and wild animals in Iraq like sheep and gazelles [4,5]. Variations depend upon factors like age, breed, season, activity of ticks etc., and it is economically an important disease in Iraq[5]. Outbreak in exotic and crossbred cattle has mostly been reported during the hot and humid months [3]. The present study represent the first attempt to investigate babesiosis in cattle in Tikreet city and its surroundings.

Materials And Methods

A total of 97 cattle were examined between October 2009 to July 2010 to find out the prevalence of babesiosis in Tikreet city and its surrounding areas. Physical examinations were done in the field and thin blood smears on clean glass slides were prepared from each animal after having punctured marginal ear vein. These blood smears were air dried, fixed in methyl alcohol for 10 minutes and stained with working dilution of 10% Giemsa stain for 30 minutes. The smears were then washed with tap water to remove extra stain and air dried [6]. The stained blood smears were examined under oil immersion lens of microscope (type Olympus/Japan)at (100X) for the presence of Babesia. About 10 ml of blood was collected from the jugular vein of the infected cattle, into a sterilized and dry syringe with needle. The effect of babesiosis on hemoglobin was determined by the procedure described previously [7]. Statistical analysis was performed using analysis of one-way ANOVA analysis with the help of SPSS computer software [8].

Results And Discussion

Clinical manifestations revealed the presence of nervous signs, weakness, dark red or brown-colored urine in

some cases and animals being unable to stand [3]. Babesia bovis were identified by their morphological characteristics as described in standard texts figure (1).In the present study, the overall prevalence of Babesia bovis in cattle was 8.8% table (1). These findings agreed with Guglielmone et al. [9] who reported the prevalence of Babesia bovis ranging from 7.6% to 18.2% in Argentina. Nazir [10] reported 7% prevalence of babesiosis in cattle at Malak and Agency, Pakistan. Aulakh [11] reported the prevalence of babesiosis as 5.94% in India, which is also in close agreement with the results of current study. The minute difference may be due to different climatic conditions. The current results are not in agreement with Bell et al. [12] and Oliveria et al. [13], who reported prevalence range of 70 to 100 %. This difference may be attributed to the application of highly sensitive tests like PCR. ELISA. and CFT for diagnostic purposes and also to the different environments of their studies. Among 11 positive animals, 63.6% were aged between 2-4 years, and 36.4% between 6 months - 2 years as shown in table (1). This is accordance with Muhanguzi et al. [14] who reported highest prevalence (83.3%) in animals aged more than 3 years followed by the lowest prevalence in animals less than one year of age because the calves are protected by normal acquired immunity until about seven months of age .The study was conducted for one year to observe the seasonal prevalence; the distribution of infection was highest in summer followed by autumn & the lowest was in cold months as shown in table (2). This might be due to more number of ticks in monsoon which were developed during summer months. This is in accordance with the observations were made by Kabi et al. [15], they are found highest prevalence in monsoon months, which might be due to more number of ticks which were developed during summer months. The Hematological values were adversely affected in positive cases. The average of hemoglobin level in infected cattle was reduced to 9 gm/100ml, this might be due to damage caused by the organisms inside the RBC's during their multiplication, this result agreement with Niazim et al. [2], Aulakh [11] and Bala [16] which they reported low levels of hemoglobin in animals infected with Babesia bovis.



Fig.(1): Babesia bovis stained with Giemsa ,100X

Table 1. The rate of infection with babesiosis in cattle according to the age factor

Age groups	No. of cows examined	No. of cows infected	Percentage of infection
6 mon.* – 2 years	49	4	8.1
2 - 4	48	7	14.6
overall	97	11	8.8

*months

Table 2. Prevalence of babesiosis in cattle according to the seasons

seasons	No. of cows examined	No. of cows infected	Percentage of infection
Winter	19	-	-
Spring	24	-	-
Summer	23	9	39.13
Autumn	21	2	9.24
Overall	97	11	8.8

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انتشار طفيلي Babesia bovis بين الماشية في مدينة تكريت والمناطق المجاورة لها مع دراسة دموية

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الملخص

تضمنت هذه الدراسة الكشف عن الخمج بطفيلي Babesia bovis في الماشية في مدينة تكريت والمناطق المجاورة لها. أخذت 97 عينة من الدم بصورة عشوائية من حيوانات تراوحت أعمارها بين 6 اشهر و 4 سنوات . أظهرت النتائج أن نسبة الخمج بهذا الطفيلي 8.8% . معظم حالات الخمج حدثت في أشهر الصيف والخريف واختفت في الشتاء. ومن بين المجاميع العمرية المختلفة للحيوانات فان الخمج يصيب عادة الأعمار الكبيرة. بينت الدراسة الدموية انخفاض معنوي في تركيز الهيموغلوبين للحالات الموجبة المصابة بداء البابيزيا .يمكن ان تعتبر هذه النتائج التسجيل الأول لهذا الطفيلي في مدينة تكريت ، محافظة صلاح الدين.