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## Study the incidence of babesiosis in cattle of afghan refugees in Mohmand agency, Pakistan

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### Abstract

The present study was conducted to determine the incidence of babesiosis in cattle of Afghan refugees in Mohmand Agency, FATA, and Pakistan. Blood samples from 380 animals (190 cow and 190 buffaloes) were randomly collected and screened for the incidence of babesiosis. Out of which 38 cattle were found positive for babesiosis, making an overall infection rate of 10%. The species of babesia parasites identified in this survey along with their incidence was: *Babesia bovis* 23 (12.10%) and *Babesia bigemina* 15 (7.89%) respectively. It was concluded that *Babesia bovis* and *Babesia bigemina* cause babesiosis in cattle, which is one of the major pathogenic tick borne haemo parasitic disease of cattle and other domestic animals.

**Keywords:** Cattle, babesiosis, *Babesia bovis*, *Babesia bigemina*, Afghan Refugees

### Introduction

Cattle play an important role in the economy of Pakistan; where about 70% population is living in the rural area. They provide rich diet to the population in terms of meat and dairy products. According to the Food and Agriculture Organization (FAO), by the year 2000 short fall between the demand and production of dairy products in Pakistan would range from 2-6 million tons depending upon low and high demand projection<sup>[1]</sup>. Due to unplanned farming, ill managed husbandry practices and poor nourishment are in fact the predisposing factors creating many problems including parasitism, which produce adverse effects on growth rate, fertility, and milk and meat production<sup>[2, 3]</sup>. It was estimated that the annual economic losses due to parasitic diseases of food animals in Pakistan were 470 million to 1166.5 million rupees<sup>[4]</sup>. Babesiosis is one of the tick-borne protozoan diseases of cattle, which figure prominently in the list of serious diseases of livestock industry all over the world<sup>[5]</sup>. Babesiosis is a haemoparasitic disease caused by *Babesia bovis* and *Babesia bigemina* in cattle. Babesiosis is the cause of anemia and hemoglobinuria in cattle. Ticks play an important role in transmitting the protozoan transovarially from one generation to another. The disease babesiosis is particularly severe in native animals introduced into the endemic area<sup>[6]</sup>. There are a number of reports describing the development of *Babesia* species in the mid gut of tick vector<sup>[7,8]</sup>. Babesiosis is primarily a disease of older animals<sup>[9]</sup>. The rapidly dividing parasites in the red blood cells (RBC) produce rapid destruction of the erythrocytes accompanying hemoglobinaemia, hemoglobinuria and high fever. This may cause the death of the animal within a few days during which the packed red cell volume falls below 20%. The parasitemia is usually detectable when the clinical signs are clear and may involve between 0.2%-45 percent of the red cells depending upon the species of *Babesia* parasites<sup>[10]</sup>. As no study seem to have been undertaken to assess the magnitude of this problem in cattle of Afghan refugees in Mohmand Agency, so this study aims to describe the incidence of babesiosis in their cattle. The outcome of this study will help in the management of this disease and to analyze the data regarding the incidence of babesiosis in the cattle of Afghan refugees.

### Materials and Method

Clean and grease free glass slides were used for making blood films, which were prepared as follows.

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The ear vein was given a gentle prick with the help of a sharp and sterilized needle, to ooze out the blood. In order to make the blood smears, a clean slide was held between thumb and finger and a small drop of blood was placed at one end of a clean slide (examination slide), another clean slide (spreader slide) was placed on its edge across the center of examination slide. The lower edge of the spreader slide was kept at an angle of 30° and the spreader slide was gently pushed towards left until the blood exhausted. The blood film was dried and fixed in Methanol and then was marked with black marker. Geimsa's stain was used for staining purpose. A stock solution of Geimsa's stain was diluted with distilled water in 1:10 ratio and double filtered by using Whatman No.1 filter paper (12.5cm dia). Blood smears were then washed with water to remove the extra stain and allowed to dry. Blood films were examined under oil immersion objective (X100). A thorough examination of each slide was performed for examining *Babesia* parasites.

**Results and Discussion**

The present study was conducted from July to October 2007 in different villages of Mohmand Agency, (FATA). The aim of this study was to determine the incidence of babesiosis in cattle of Afghan refugees settled in Mohmand Agency FATA, Pakistan. A total of 380 blood smears from 190 cows and buffaloes were randomly made and screened in Parasitological laboratory of Veterinary Research Institute (VRI) Peshawar. Out of 380 blood smears, 38 were found positive for babesiosis making an overall infection rate of 10%. Table I summarizes the incidence of babesiosis in 380 cattle (190 cows and 190 buffaloes) examined.

**Table 1:** Incidence of babesiosis in 380 animals examined

Animal (host)	Total blood smears	Positive blood smears	Incidence rate (%)
Cows	190	23	12.10
Buffaloes	190	15	7.89
Overall Incidence	380	38	10.00

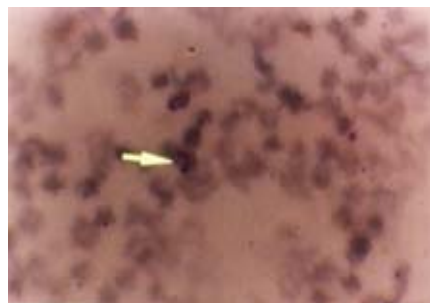
Table 1. Shows that out of 190 cows examined 23 cows out of 190 were found positive for babesiosis with an incidence of 12.10%. Similarly out of 190 buffaloes, 15 were found positive for babesiosis with an incidence of 7.89%. This shows the slightly higher incidence of babesiosis in cows. Comparable results of babesiosis in cattle were reported by scientists in Pakistan [4, 5, 11, 12, 18] and from other parts of the world [14, 19, 7, 15]. These results revealed that cows might be more susceptible to babesiosis than buffaloes in Pakistan as well as in other parts of the world [22, 23, 24].

**Table 2:** Species-wise incidence of *babesia* parasite in 380 animals examined

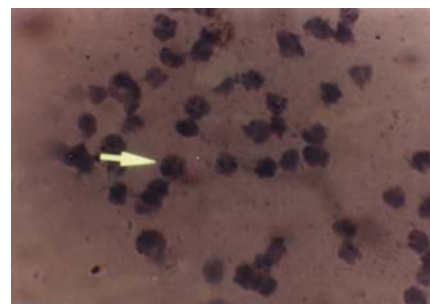
Babesia species	Blood samples examined	Positive samples	Incidence rate (%)
<i>Babesia bovis</i>	380	23	6.05
<i>Babesia bigemina</i>	380	15	3.94

Table 2 indicates species wise incidence of *Babesia* parasites in 380 cattle examined. The species of *Babesia* parasites identified in this survey were *Babesia bovis* 6.05% and *Babesia bigemina* 3.94% respectively. Khan *et al.*, 2005, Kokab, 1986, Anwar *et al.*, 1989, Afzal *et al.*, 1991, Sadaqat, 2001 and Shakir (2001) have also reported the occurrence of *Babesia bovis* and *Babesia bigemina* in cattle of Pakistan [11,

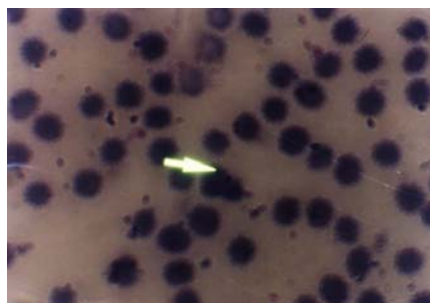
18, 12, 117, 18]. The present data have revealed that both species of *Babesia* i.e *Babesia bovis* and *Babesia bigemina* are endemic in Mohmand Agency, FATA Pakistan. These two species of *Babesia* have been found to prevail in cattle of the sub-continent since long [6, 13].



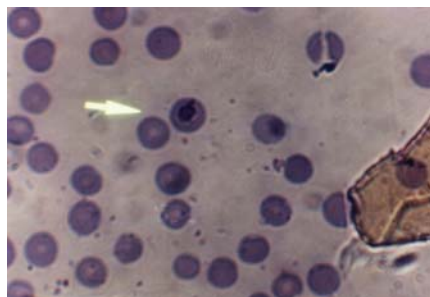
**Fig 1:** *Babesia bigemina*



**Fig 2:** *Babesia bigemina*



**Fig 3:** *Babesia bovis*



**Fig 4:** *Babesia bovis*

**Conclusion and Recommendations**

It is concluded that *Babesia bovis* and *Babesia bigemina* cause babesiosis in cattle, which is one of the major pathogenic tick-borne hemiparasitic disease of cattle and other domestic animals. The advancement of chemotherapy and vaccination may control Babesiosis and other parasitic diseases in Pakistan that results in an increase in milk and meat production. Further studies are needed to determine the ill effects of such sub clinical infections.

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