Biological Forum – An International Journal **7**(2): 792-794(2015)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Pervasiveness of tick borne disease, Babesiosis in Quetta City of Province Balochistan, Pakistan

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(Received 17 August, 2015, Accepted 09 November, 2015)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Babesiosis is an economically important and chief arthropod-borne disease, which is commonly known as cattle fever or tick fever abundantly found throughout the world. In the present study, a total of 110 cattle's includes 82 females (cows) and 28 males (bulls) were analyzed from different farm houses of Quetta city to check the infestation of ticks as well as suffer from tick born disease that is babesiosis. According to the obtained results of the present study, cows were found to be more susceptible to severe babesiosis because out of their total observed samples (n=82), 54.8% were found to be infested. Furthermore, among these infested cows, 31.1%were suffering from severe babesiosis, while 42.2% were suffered from mild babesiosis. While in contrast, out of 28 observed bull samples, 42.8% were found to be infested. Out of these infested bulls, 33.3% were suffered from severe babesiosis, while the remaining 33.3% were suffering from mild babesiosis.

Key words: Prevalence's, Cattle's, tick fever, Babesiosis,

INTRODUCTION

Health condition of livestock and their production have burnt by ectoparasites (Khan *et al.,* 2013). In tropical and subtropical countries, ticks are thriftily the most important pests of cattle and other household species. Infestation of ticks lowers the reduction of animals as well as causes the transmission of protozoan disease (Gray and Potgieter, 1982). Disease causes by ticks are confining to Pakistan, Bangladesh and India because their climatic conditions are appropriate for the growth and development of ticks (Gosh *et al.,* 2007).

Ticks are the vectors of large number of pathogenic microorganisms including protozoan's (babesiosis, theileriosis), rickettsiae (anaplasmosis, ehrlichiosis, typhus). Babesiosis is world-wide spread disease that is distressing many species of mammals and predominantly cattle and man. Babesiosis was the initial disease that was spread to mammals by the arthropod that was implicated in the twentieth century. This disease was firstly eradicated from the region of North America. The foremost impact occurs in the cattle industry, where bovine babesiosis possesses a massive economic effect due to loss of meat and beef production in infected animals (Mosqueda *et al.,* 2012). Bovine babesiosisis a tick-borne parasitic infection causes significant morbidity and mortality in cattle's all over the world.

In cattle, four Babesia species are mostly found including, *Babesia divergens, B. major, B. bigemina* and *B. bovis*. The maximum economic losses is occur due to two species, *B. bigemina* and *B. bovis*, which are transmitted by *Boophilus microplus* (Sevinc *et al.,* 2001). The most prevalent species are *Babesia bovis* and *B. bigemina*, which are found through out the most tropical and subtropical regions of the world. The economic losses from these two organisms can be considerable, particularly in developing countries, although, babesiosis can be controlled with vaccination and treated with antiparasitic drugs. Bovine babesiosisis caused by *Babesia bigemina* and *Babesia bovis* continues to be a significant restriction to live stock production in countries with tropical or subtropical climates (McCosker, 1981). Bovine babesiasis and Theilerias is along with various blood protozoan diseases can cause profound losses due to death, decreased production and lowered working competence of affected animals (Zahid *et al.,* 2005). Therefore, present study was designed to find out the prevalence of Babesiosis in tick infested cattle's at five farms of Quetta district of Pakistan in order to provide information regarding to the economic loss that is occur due to the spread of this tick-born disease in dairy farms.

MATERIALS AND METHODS

In the present investigations, a total 110 animals were examined for observing the infestation of Babesiosis. Each animal body was explored thoroughly for collection of tick samples.

Ticks were collected by hand picking method as well as by using forceps without damaging body parts of ticks. Collected ticks preserved in 70% alcohol in field., while in laboratory samples were boiled for 10 minutes in KOH for the purpose of softening the ticks to make excellent whole mount, afterwards the samples were using distal water, tick samples were replaced and dehydrated with 30%, 50%. 70%, and 90% alcohol then with 10% HCL for 10 minutes (Iqbal and Nawaz, 2007), then dehydrated for making whole mount. Ticks were morphologically observed under stereomicroscope and identified by using identification keys followed by Soulsby (1982).

Blood samples were taken from 110 animals including 28 bulls and 82 cows that are infested with ticks in sterilized tubes containing anticoagulant from jugular veins of the animals during the study period that extends from October 2013 to July 2014. Microscopy is still the cheapest and fastest method used to identify Babesia parasites, while their compassion and specificity are restricted (Mosgueda *et al.,* 2012). Then prepared thin blood smear, air dried for fixation by using absolute methanol for 10 minutes and then use Gimsa stain for staining. Prepared slides were then examined under stereo microscope for observing the presence of Babesia organisms.

RESULTS AND DISCUSSION

The obtained results of the present study were presented and recorded in the Tables 1-3, respectively. The obtained results of the present study revealed that the prevalence of babesiosis in randomly selected farms of District Quetta was found to be highest in cattle farm located at Nagori Sattlite Town, and this was followed by Nasir Awan Jan Muhammad road> Gul Khan Kawari road in decreasing order, while lowest values were recorded in farms located at Muneer Khan Jan Muhammad road and Bismillah Sattlite Town, as shown in Table 1, respectively. Furthermore, in general, the prevalence of babesiosis was seems to be high in cow than bulls that is 54.8% in total catch samples (n=82). Bennet *et al.* (2006) reported that there is a chance to relate the occurrence of ticks-born disease due to the change in climate because a positive relationship had been observed in the prevalence of these tick diseases with mild humid, warm winter and summer. While Table 2 and 3 illustrate the infestation rate (%) of babesiosis in cows and bulls studied in selected farms of Quetta district.

Table 1: Prevalence of babesiosis in randomly selected farms of District Quetta.

Farms location	Total no. of cows	Number of infested cows	Total no. of bulls	Number of Infested bulls
Gul Khan Kawari road	18	11	5	2
Nasir Awan Jan Muhammad road	22	13	8	3
Muneer Khan Jan Muhammad road	9	4	2	1
Nagori Sattlite Town	26	15***	11	5***
Bismillah Sattlite Town	7	2*	2	1*
Grand total	82	45	28	12
% of infested cattle's		54.8		42.8

Note: *** shows highest values, * shows lowest values.

Table 2: Infection rates in percentage for babesiosis in cows studied in various farms of Quetta.

Farms location	Infested Cows	Babesiosis positive	Mild	Sever
Gul Khan Kawari road	11	5	3	2
Nasir Awan Jan Muhammad road	13	4	3	1
Muneer Khan Jan Muhammad road	4	2	2	0
Nagori Sattlite Town	15	7	5	2
Bismillah Sattlite Town	2	1	1	0
Grand total	45	19	14	5
Percentages		42.2	73.7	35.7

According to the obtained results of this study, cattle's were more prone to severe babesiosis because out of total babesiosis positive cows, 35.7% suffered from severe babesiosis, while 73.7% suffered from mild babesiosis. But in contrast, out of total babesiosis positive bulls, 20.0% suffered from severe babesiosis, while 80.0% were suffering from mild babesiosis as shown in Tables 2 and 3, respectively.

Table 3: Infestation Rate (%) in percentage for babesiosis of Bulls of various farm of Quetta.

Farms location	Infested Bulls	Babesiosis positive	Mild	Severe
Gul Khan Kawari road	2	0	0	0
Nasir Awan Jan Muhammad road	3	1	1	0
Muneer Khan Jan Muhammad road	1	0	0	0
Nagori Sattlite Town	5	2	2	1
Bismillah Sattlite Town	1	1	1	0
Grand total	12	5	4	1
percentages		41.7	80.0	20.0

Stevens *et al.* (2006) reported that such variation in tick infestation rate is not only connected with the change in climate but it can also be because of the vulnerability of the breeds that are kept by farmers. The choice of new productive breeds, intensified production as well as husbandry practices that are traditional to a certain extent than modern techniques has led to an amplified receptiveness to parasites. According to McCosker, (1981), the majority of the 1.2 billion cattle of world are exposed to babesiosis, but this estimated figure had not clarified the number at risk to disease. McLeod and Kristjanson (1999) developed a (Tick Cost) spreadsheet model to find out the overall ticks and tick-borne diseases impact and also reported and calculated control and losses of anaplasmosis and babesiosis. As a results, they (1999) concluded that these two tick-borne diseases alone can create early losses that is16 US$ at 9m per year to Australian cattle industry with 'tick worry'. Thus, our present study will provides useful information related to the Pervasiveness of Babesiosis in district Quetta, Balochistan that could be very helpful for the future study of Babesiosis in cattles of Quetta and estimation of economic loss due to their high prevalence rate in the dairy farms of Quetta.

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