

Incidence of Haemoprotozoan diseases in Cattle & Buffalos Bihsood district in Nangarhar Province

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Abstract: Haemoprotozoan diseases affect both the production and reproduction of animals, they are big risks for the health of ruminants especially for cattle and buffalos. Haemoprotozoal disease in cross bred cattle and buffalo were studied on seasonal base by examining 192 samples of each species were collected from jagular veins of animals of various villages located in Bihsood district of Nangarhar province, from March 2017 to February 2018 to determine the most favorable season of their incidence.

From June to September and June to August respectively, the result shows higher incidence of haemoprotozoal diseases in cross bred cattle and buffalo, crossbred cattle 72.39% were positive for haemoprotozoal infection, while in buffalo 63.02% were positive for the mentioned haemoprotozoal infection. During the summer season in both species, higher incidence of haemoprotozoal diseases incidence were recorded compare to other seasons. The present study suggests that western part of Afghanistan is highly endemic for haemoprotozoan diseases and incidence of the haemoprotozoan diseases are high in summer season in both species compare to winter.

Key words: Incidence, Haemoprotozoan, babesiosis, theileriosis, Anaplasmosis and Mix infection.

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I. Introduction

Health and productive performance of cattle and buffalos haemoprotozoan diseases, particularly Babesiosis, Anaplasmosis, Theileriosis and Trypanosomiasis are considered some of the major impediments (Rajput et al., 2005). Throughout the globe tick-borne disease cause significant losses to the livestock industry (Ananda et al., 2009) Due to obvious reason of death, decreased productivity and lowered working efficiency these have got a serious economic impact (Uilenberg, 1995). Inadequate introduction of genetically improved cattle in an area (Blood et al., 1994) and improved cost for control measures (Makala et al., 2003). In this regards, ticks are highly connected to initiation of many diseases in the field. Humid and hot climate is immensely favorable for the survival and development of ticks (Kohli et al., 2014). The geoclimatic and agro-ecological conditions of the area are hugely favorable for the multiplication and growth development of ticks which act as natural vectors of Theileriosis, Babesiosis and Anaplasmosis (Bhatnagar et al., 2015). Haemoprotozoan parasites are mostly tick borne and great economic significances in Asia and has always been a formidable barrier to the survival of cross bred cattle in India (Devendra and Gardiner, 1995). Bovine theileriosis is caused by the protozoan parasite of Theileria species (Theileria annulata and Theileria parva) which are round ovoid rod like or irregular shaped organism found in lymphocytes, histiocytes and erythrocytes (Durrani et al., 2008). Organisms of babesiidae family are round to pyriform, amoeboid form occurring in the erythrocytes. Its development occurs in erythrocytes by asexual division it is transmitted by Ixodid ticks (Boophilus annulatus), Anaplasmosis is essentially a disease of adult cattle caused by Anaplasma marginal and Anaplasma central. Higher incidence of haemoprotozoal diseases were recorded in crossbred cattle and buffalo, the studied was based on seasonal base for the incidence of haemoprotozoal diseases in crossbred cattle and buffalo in Anand and Kaira districts of Gujarat (Vahora et al., 2012). During April 2013 to March 2014, seasonal incidence of haemoprotozoal diseases in cattle and buffalo was studied from field to Regional Disease Diagnostic Center (RDD), it showed higher incidence of haemoprotozoal diseases from May to October and April to October in cattle and buffalo (Parvinder Kaur et al., 2015). The aim of present study was to determine monthly and seasonal base incidence of Theileriosis, Babesiosis and Anaplasmosis and mixed infection in crossbred cattle and buffaloes in Bihsood district of Nangarhar province.

II. Materials And Methods

Geographical area: This study was conducted in Bihsood district of Nangarhar province from March, 2017 to February, 2018.

Sample collection: A Total of 384 blood samples were collected from cattle and Buffaloes, blood collected from ear vein and Jugular vein of suspected animals for haemoprotozoan infection based on clinical signs such as fever, anemia, lymph node swelling. Ear vein was aseptically punctured with 18G needle and drop of blood was smeared on the grease free micro slide, dried and wrapped in a clean paper. Whole blood was collected from Jugular vein into vial containing EDTA, then kept on ice until hematological examinations.

Processing of Blood Samples: The smears were fixed with methanol, Giemsa stain was used for its staining, examined under microscope (100X), immersion oil used for identification of blood parasites as described by (Benjamin, 1978).and (Soulsby, 1982).

III. Results

To detect the seasonal prevalence of Haemoprotozoan diseases in cattle and Buffalo, this study was conducted for one year, an extensive seasonal variation found with the occurrence of haemoprotozoan diseases in elected animals of the experiment. The higher percentage of incidence of haemoprotozoal diseases was recorded during June to September (summer) in crossbred cattle and buffalo, results shown in (Table-4) (Table-5).

The incidences of haemoprotozoan diseases in crossbred cattle and buffalo were 72.39 % and 63.02% respectively. The overall incidences of Babesiosis, Anaplasmosis, Theileriosis and Mixed Infections in crossbred cattle were 18.75 %, 2.12 %, 29.16 % and 21.35 % respectively, while in buffalo the overall incidences of Babesiosis, Anaplasmosis, Theileriosis and Mixed infections were 15.62 %, 4.16 %, 26.04 % and 16.14 % (Table-1 and Table-2).

The prevalence of Haemoprotozoal diseases in crossbred cattle were significantly ($p < 0.05$) high during summer (83.3 %), followed by moderate in autumn and spring (72.91%), (70.83 %) compare to winter (60.41 %) seasons (Table-1). On the other hand, the prevalence of Haemoprotozoal diseases in buffalo were significantly ($p < 0.05$) high during summer (68.75 %), followed by moderate in autumn and spring (62.5 %), (64.58 %) and compare to winter (56.25 %) seasons (Table-2).

The results of this study shows that the incidences haemoprotozoal diseases are higher in crossbred cattle than the buffalo (Table-3). And care should be taken for their clinical signs and on time treatment as well.

Table 1: Month and Seasonal wise incidence of Haemoprotozoal diseases, detected in cattle during March 2017- February 2018.

Species	season	Month	Theileriosis	Babesiosis	Anaplasmosis	Mixed infection	Total positive cases	Total blood smears	Seasonal Prevalence %
Cattle	Spring	March	4	3	1	5	13	16	81.25
		April	3	3	0	4	10	16	62.5
		May	4	2	1	4	11	16	68.57
	Total					34	48	70.83%	
	Summer	June	7	3	0	2	12	16	75
		July	8	4	1	2	15	16	93.75
		August	5	3	1	4	13	16	81.25
	Total					40	48	83.3%	
	Autumn	September	6	3	0	3	12	16	75
		October	3	4	0	4	11	16	68.75
		November	4	4	1	3	12	16	75
	Total					35	48	72.91%	
	Winter	December	5	3	0	4	11	16	68.75
		January	3	2	0	3	8	16	50
		February	4	2	1	3	10	16	62.5
Total					29	48	60.41		
Total						139	192	72.39%	

Table 2: Month and Seasonal wise incidence of Haemoprotozoal diseases detected in Buffalos during March 2017- February 2018.

Species	season	Month	Theileriosis	Babesiosis	Anaplasmosis	Mixed infection	Total positive cases	Total blood smears	Seasonal Prevalence %
Buffalo	Spring	March	5	3	0	3	11	16	68.75
		April	3	2	1	3	8	16	50
		May	4	3	1	2	7	16	43.75
	Total					30	48	62.5%	

Summer	June	6	2	1	1	10	16	62.5
	July	7	2	2	3	14	16	87.5
	August	4	2	0	3	9	16	56.25
Total						33	48	68.75%
Autumn	September	4	3	1	2	12	16	75
	October	4	2	1	3	10	16	62.5
	November	4	3	0	2	9	16	56.25
Total						31	48	64.58%
Winter	December	3	3	0	4	10	16	62.5
	January	4	3	0	2	9	16	56.25
	February	2	2	1	3	8	16	50
Total						27	48	56.25%
Total						121	192	63.02%

Table 3: Incidence of Haemoprotozoal diseases detected in cattle and Buffalo during March 2017- February 2018

Animals	Number of Sample	Number of Positive	Number of Negative	Incidence Percentage (%)
Cattle	192	139	53	72.39%
Buffalo	192	121	71	63.02%

Table 4: Seasonal incidence of Haemoprotozoal diseases detected in cattle during March 2017- February 2018

Animals	Season	Number of Sample	Number of Positive	Number of Negative	Seasonal Incidence Percentage (%)
Cattle	Spring	48	34	14	70.83%
	Summer	48	40	8	83.3%
	Autumn	48	35	13	72.91%
	Winter	48	29	19	60.41

Table 5: Seasonal incidence of Haemoprotozoal diseases detected in Buffalo during March 2017- February 2018

Animals	Season	Number of Sample	Number of Positive	Number of Negative	Seasonal Incidence Percentage (%)
Buffalo	Spring	48	30	18	62.5%
	Summer	48	33	15	68.75%
	Autumn	48	31	17	64.58%
	Winter	48	27	21	56.25%

IV. Discussion

The seasonal variation with occurrence of haemoprotozoan was considerable. The highest prevalence found from June to September (summer) in cattle and buffalo. So, Haemoprotozoan diseases vary greatly according to season.

Previous study has reported that the observation of haemoprotozoan diseases were higher in summer season (Ananda et al., 2009), (Blood et al., 1994) and (Roy et al., 2004), observed that higher incidence of haemoprotozoan diseases are depending on humidity, temperature and rainfall might be count as predisposing factors for higher prevalence of mentioned infections from June to September. In another study, the higher incidence of haemoprotozoal diseases in crossbred cattle and buffaloes were from June to September and June to August (Parvinder Kaur et al., 2015).

In the present study the highest prevalence of Haemoprotozoan diseases founded during summer season in cattle and buffalo which support the results of above studies.

During the summer season the incidence of Theileriosis was higher among other haemoprotozoan diseases, in crossbred cattle and buffalo reported 29.16% and 26.04% respectively as compared to other haemoprotozoan diseases. The current study supports the earlier study of Theileriosis infection (Jithendran and Sharma, 1998), he reported that theileriosis cases are generally observed during the rainy season or in summer, while ticks have higher activity although sporadic outbreaks have been recorded in year round.

In the present study, examination of 384 blood smears from crossbred cattle and buffaloes concluded that the positive cases of haemoprotozoal diseases in crossbred and buffalo were 72.39 % and 63.02 % respectively, these results agree with (Ananda et al., 2009) and (Vahora et al., 2012). They observed the prevalence in crossbred cattle (43.1%) and in buffalo (17%).

V. Conclusion

Respective to the aim of the study; to determine the seasonal prevalence of Haemoprotozoan diseases in Cattle and Buffalo, this study was conducted in duration of one year. It shows that high prevalence of haemoprotozoal diseases recorded in crossbred cattle and buffalo during June to September and June to August, and the highest prevalence of haemoprotozoal diseases were in summer season compare to other 3 seasons of the year.

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