



Prevalence of *Theileria annulata* Infection in Cross Bred Cows of Indore District of Madhya Pradesh

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ABSTRACT

Total of 300 cross breed cattle were screened for *T. annulata* infection on the basis of blood smear and lymph node biopsy examination, of which 68 animals were found to be positive indicating 22.66 percent prevalence of *T. annulata*. at different villages of Indore district. Out of 68 positive cases, 21 animals died due to clinical *T. annulata* infections indicating a mortality rate of 30.88 percent. The mortality rate was higher in calves (both male and female) 59.25 percent. The remaining 47 animals (69.12 percent) recovered owing to the treatment. The mortality in heifers less than 3 years was found to be 20.00 percent and mortality in adult female cows more than 3 years was 7.69 percent. In the adult cow, out of 26 positive cases, 10 cows were under physiological stress condition of lactation. Among the samples collected the highest prevalence was observed at private dairy farm of Asravad village (33.33%) and lowest at Silotiya village (18.7%).

Keywords: Theilariosis, prevalence, mortality

Theilaria annulata is a tick borne protozoan parasite of cattle that infects Leukocytes and RBCs and causes an acute Lymphoproliferative disease known as Bovine Tropical Theileriosis. Tropical theileriosis has a particularly devastating impact on small holder farmers which represent the majority of livestock owners in endemic area.

In Indian bovines Theileriosis is mainly caused by *Theileria annulata* and the disease is known as bovine tropical theileriosis. "The chief vector responsible for transmission is *Hyalomma anatolicum anatolicum* and other ticks species belonging to the said genera. The transmission of theilerial particles-from one stadia to another stadia takes place called transtadial transmission. The *T. annulata* cannot survive for longer period in the tick and hence no transoverian transmission occurs.

Bovine tropical theileriosis that is transmitted by the tick *Hyalomma anatolicum anatolicum*, affects the exotic and

cross bred cattle and young indigenous calves (Kumar *et al.*, 1991). The disease in its mildest form is responsible for lower milk production while in severe cases causes high mortality resulting in economic losses to the dairy farmers (Reddy *et al.*, 1991).

MATERIALS AND METHODS

Crossbreed cattle at different dairy farms (organized and unorganized) of different villages of Indore district (Silotiya, Tillore, Bagoda, Cheerakhan, Datoda, Merkhedi, Asrawad Khurd and Indore) were included to record the prevalence of Bovine Tropical Thileriosis. A total of 300 crossbreed cattle of different of age and either sex showing high rise of body temperature were screened on the basis of blood smear examination for BTT. Blood smear were fixed in methanol and standby Stained by Giemsa method of staining (Jain, 1986). Prevalence was recorded as age

wise and classified as calves (upto 1 year of age), heifer (1-3 years of age) and adult cows (>3 years). Prevalence data was recorded on the season basis.

RESULTS AND DISCUSSION

A total of 300 cross breed cattle were screened for *T. annulata* infection on the basis of blood smear and lymph node biopsy examination, of which 68 animals were found to be positive indicating 22.66 percent prevalence of *T. annulata*. at different villages of Indore district. Out of 68 positive cases, 21 animals died due to clinical *T. annulata* infections indicating a mortality rate of 30.88 percent. The mortality rate was higher in calves (both male and female) 59.25 percent. The remaining 47 animals (69.12 percent) recovered owing to the treatment. The mortality in heifers less than 3 years was found to be 20.00percent and mortality in adult female cows more than 3 years was 7.69 percent. In the adult cow, out of 26 positive cases, 10 cows were under physiological stress condition of lactation. Among the samples collected the highest prevalence was observed at private dairy farm of Asravad village (33.33%) and lowest at Silotiya village (18.7%). (Table 1)

In general, prevalence of *T. annulata* infection was more in animals with heavy ticks infestation. Among the adult cattle cow more than 3 years prevalence of *T. annulata* was found to be 18.43 percent, heifers (1 to 3 years) the prevalence was found to be 21.73% and among calves up to 1 year age the prevalence was higher 30%.

68 out of 300 Giemsa stained blood smears revealed the presence of *T.annulata*. The mean monthly and mean seasonal prevalence of theileria are shown in Table 2. The relative prevalence of the disease were higher during hot dry season (May-July) and wet season (Aug.-Oct.) periods than during cool dry season (Nov.-Jan.) and dry season (Feb.-April.). Periods being 30.12%, 20.22%, 10.88% and 17.28% for four periods respectively. (Table 2)

The overall monthly prevalence of *T. annulata* was 22.66%. The highest relative prevalence (33.33%) was in month of Aug. and lowest prevalence was recorded in the month of Jan. (9.09%).

The prevalence of *T. annulata* recorded as 22.66 percent in the present study, indicating a drop in the prevalence of the disease as compared to the previous findings of Dhar *et al.*

Table 1: Age wise prevalence of *T. annulata* in different villages

Sl. No.	Location of animals	Positive cases/animals screened				Total
		Calves		Heifers	Adult cow more than 3 years	
		Female	Male			
1	Silotiya	2/6(33.33)	2/8 (25.)	2/12(16.66)	1/25(4.00)	7
2	Tillore	2/7(28.57)	2/4(50)	1/11(9.09)	6/21(28.57)	11
3	Bagoda	0/2(0)	0/1(0)	4/8(50)	2/8(25)	6
4	Cheerakhan	0/3(0)	1/4 (25)	1/7(14.28)	3/15(20)	6
5	Datoda	0/7(0)	4/8(50)	3/18(16.66)	5/33(15.15)	12
6	Merkhedi	0/2(0)	2/3(66.66)	0/3(0)	2/15(13.33)	4
7	Asravad khurd	2/7(28.57)	3/7(42.85)	1/5(20)	2/8(25)	8
8	Indore	5/16(31.25)	2/5(40)	2/5(40)	5/16(31.25)	14
Total		11/50(22)	16/40(40)	15/69(21.73)	26/141(18.43)	68/300

Table 2: Seasonal relative prevalence of *T. annulata* infection in cross bred cows

Cool dry season	% prevalence	Dry Season	% prevalence	Hot dry season	% prevalence	Wet season	% prevalence
Nov.	13.04	Feb.	12.50	May	31.81	Aug.	33.33
Dec.	10.52	Mar.	20.00	June	30.00	Sept.	20.00
Jan.	9.09	Apr.	19.35	July	28.57	Oct.	13.33
Mean	10.88	Mean	17.28	Mean	30.12	Mean	22.22

(1990) and Singh *et al.* (2001) who reported 30-82 percent and 30-60 percent prevalence this may be attributed to the difference in the geographical area surveyed by the previous author

The prevalence of *T. annulata* was recorded as 22.66 percent in present studies is slightly higher as compared to the findings of Shariff (1997) and Sisodiya (1998), who reported 17.95 and 16.91 percent prevalence respectively of BTT in Mhow and Indore region of Madhya Pradesh. The higher prevalence in the present study maybe due to differences in managemental practices low tick resistance seasonal variation and lack of treatment facility.

A much lower prevalence rate (3.06%) reported by Sharma and Mishra (2000) was due to the survey conducted in hilly areas where the vector activity is much reduced.

The prevalence of BTT reported as 53.6 and 51.89 percent by Shastri *et al.* (1982) and Singh (1992) from different parts of the country indicate a high prevalence of the disease. This higher rate of prevalence was probably due to Serodignostic method adopted for the survey and inclusion of the carrier animal to study the overall prevalence.

In the present study the prevalence in the adult cow was 18.43 percent while in heifers it was 21.73 percent while in calves it was 30 percent the variation in disease prevalence among different age groups could be explained by findings of Shastri *et al.* (1981). The high prevalence of *T. annulata* in calves might be due to high tick infestation and lack of grooming practices, this findings is in accordance with the report of Kleindorfer *et al.* (2006). The higher prevalence of *T. annulata* noted in male calves 40 percent as compared to the female calves 22 percent was conceivably due to the proper care and treatment provided to the female calves keeping in view the future contribution of females to the economy of the dairy industry. On the other hand, male calves are neglected they were not allowed for milking due to improper feeding their immune resistance decreased This might be the probable reason for higher mortality rate observed in male calves (68.75%) than in female calves (45.45%) and the overall mortality rate (30.88%) observed in present study are in collaboration with findings of Shakap *et al.* (2007) who documented mortality rates up to 30%.

The prevalence of *T. annulata* was noted to be higher at unorganized dairy farms as compared to the organized

farms which reflects that on the organized farm appropriate and improved managemental practices adopted. This findings are closely proximate with study of Shariff (1997).

The highest prevalence of *T. annulata* in the present survey was found in Asravad village (33.33%) indicating that in the surveyed village there was lack of adoption of managemental practices and high infestation of ticks which lead to high prevalence of diseases. The lowest prevalence of *T. annulata* was observed in Silotiya village (13.70%) which indicates that in the village there was good adoption of managemental practices and tick control was also adequate. The highest and lowest prevalence in Asravad and Silotiya villages respectively were in tune to the statement of Banerjee and Sangwan (1990) and Biancha *et al.* (2003). These variation is might be due to differences in managemental practices adopted in above mentioned villages.

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