Prevalence of *Theileria annulata* infection in cattle at Vallabhnagar region, Udaipur district of Rajasthan

Deepika, Sandhya Morwal and SK Sharma

**Abstract**

The present study was carried out to determine the prevalence of bovine tropical theileriosis in cattle. A total of one hundred forty five cattle were examined during July to November-2021 out of which, thirty cattle were found positive for *Theileria annulata* infection on the basis of Giemsa-stained blood and lymph node aspirate smears examination. The overall prevalence of bovine tropical theileriosis amongst cattle was found to be 20.69 percent. The prevalence was higher irrespective of age from 0 to 6 month (33.33%), sex wise (23.00% in female), Breed wise (27.50% in Cross breed), Month wise July and August (33.33% and 30.00%) while lower prevalence irrespective of age above 2 year (17.28%), sex wise (15.55% in male), breed wise (12.30% in non-descript) and month wise October (11.90%) was recorded.

**Keywords:** Theileriosis, prevalence, giemsa-stained

**Introduction**

India has 302.79 million bovine population, out of which total cattle population is 192.49 million (Male cattle, 47.37 million & Female cattle,145.12 million) and the population of cattle in Rajasthan, 1.39,37,630 million (Exotic cattle, 23,23,033 million & indigenous cattle, 1,16,14,597 million) and Udaipur district of Rajasthan having 8,31,496 million (Exotic cattle, 80,211 million & indigenous cattle, 7,51,285 million) cattle population. (According to 20th livestock census, 2019), Theileriosis is a burning problem of the livestock in veterinary field, due to this disease huge morbidity and mortality occur in cattle population, which reflects economic of farmer and elevates the poverty level (Naila et al., 2015) [10]. This economic stunned disease is more prevalent in tropical and subtropical parts of world. It is a serious challenge to the livestock improvement programme in India (Sitotaw et al., 2014) [23]. Theileriosis is more common in rainy season then summer and least in winter due to increased tick population and stress in affected animal (Parmar and Chandra, 2019) [20]. The newborn calves having high risk of theileriosis during summer and rainy season because of immediate exposure to infected ticks which are more active during this period (Sudan et al., 2012) [25]. Affected animal having highest incidence in month of October to January followed by June to September and least in February to May (Masare et al., 2009) [12]. The present study was undertaken to know the prevalence of theileriosis of cattle in vallabhnagar, Udaipur, Rajasthan.

**Materials and Methods**

**Experimental animals and duration of study**

This study was conducted at vallabhnagar area, Udaipur, Rajasthan on the clinical cases in cattle during the period from July to November 2021. During five-month study period, a total of 145 case of sick and suspected cattle were studied that was informed by farmers at TVCC, CVAS, Navania, Vallabhnagar, Udaipur. Only 30 cattle were infected by *Theileria* spp. among 145 suspected cases. age, sex, breed and month of the cattle owner of all studied were noted in the case sheet. cattle were screened showing clinical symptoms like anorexia, enlargement of superficial lymph nodes, pale mucous membrane, presence of ticks. The prevalence rate was calculated in percentage with respect to overall prevalence, age, sex, breed and month.

**Methods followed for diagnosis**

**History/Anamnesis:**

History of tick infestation, duration of illness, appetite of the animal, abnormalities in the behavior, changes in managemental and feeding practice, gait, posture, rumination, defecation...
The prevalence of theileriosis occurred found in all age groups of cattle. The prevalence of theileriosis of cattle from 0 to 6 months of age 8 (33.33%), 7 months to 2 years of age 8 (20.00%) and above two years of age 14 (17.28%). The result has been presented in Table 2. The highest prevalence observed below 6 month of age group i.e. 33.33% similar finding agreed by Brahmbhatt et al. (2019) [8] and Khawale et al. (2019) [12]. This indicates a lack of immunity in younger calves (1–6 month) especially cell mediated immunity than the older age (7–12 month) calves. It was higher infection recorded in young Gir calves of less than 6 months of age (Brahmbhatt et al., 2019) [8]. The lowest prevalence observed above 2 year of age group i.e. 17.28% and similar finding agreed by Khawale et al. 2019 [12]. The variation in age-wise prevalence might be due to collection of samples, no. of case study, environmental and geographical situation (Anbu et al., 2020) [2].

### Table 2: Age wise prevalence of bovine tropical theileriosis in cattle

<table>
<thead>
<tr>
<th>Month and Year</th>
<th>Total screened cases</th>
<th>No. of Theileriosis positive cases</th>
<th>Prevalence %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 6 months</td>
<td>24</td>
<td>08</td>
<td>33.33%</td>
</tr>
<tr>
<td>7 Months to 2 years</td>
<td>40</td>
<td>08</td>
<td>20.00%</td>
</tr>
<tr>
<td>Above 2 years</td>
<td>81</td>
<td>14</td>
<td>17.28%</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

The differences in the prevalence rate might be due to variation in the number of samples included in the study and geographical and climatic conditions. The variation in the prevalence might be due to of the study period (Murthy et al., 2014) [16].

### Table 3: Sex wise prevalence of bovine tropical theileriosis in cattle

<table>
<thead>
<tr>
<th>Sex</th>
<th>Total screened cases</th>
<th>No. of Theileriosis Positive cases</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>100</td>
<td>23</td>
<td>23.00%</td>
</tr>
<tr>
<td>Male</td>
<td>45</td>
<td>07</td>
<td>15.55%</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>30</td>
<td></td>
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</tbody>
</table>

The prevalence was highest (23%) in females compared to males (15.55%). The result has been presented in Table 3.
The prevalence was high in cross bred animals (27.50%) compared to non-descript animals (12.30%). The result has been presented in Table 4. Highest prevalence in cross breed cattle agreed with and Panda et al. (2011), Naik et al. (2016) [17], Khawale et al. (2019) [12]. Lowest prevalence in non-descript cattle agreed by Naik et al. 2016. The exotic breeds are more susceptible to Tick borne disease due to higher infestation of ticks (Glass et al., 2003; Rather et al., 2015) [10, 21]. The genetic variation makes the zebu cattle resistant than cross breed cattle (Radostits et al., 2007) [22]. Cross breed cattle are the most sensitive to heat and observed that atmospheric temperature controls the activity of *Theileria* parasites as well as their vectors (Hoffman et al., 1971) [11].

### Table 5: Month wise Prevalence of bovine tropical theileriosis in cattle

<table>
<thead>
<tr>
<th>Month and year (2021)</th>
<th>Total screened cases</th>
<th>No. of Theileriosis Positive cases</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>09</td>
<td>01</td>
<td>33.33%</td>
</tr>
<tr>
<td>August</td>
<td>40</td>
<td>12</td>
<td>30.00%</td>
</tr>
<tr>
<td>September</td>
<td>45</td>
<td>08</td>
<td>17.77%</td>
</tr>
<tr>
<td>October</td>
<td>42</td>
<td>05</td>
<td>11.90%</td>
</tr>
<tr>
<td>November</td>
<td>09</td>
<td>02</td>
<td>22.22%</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

The prevalence was highest in July and August (33.33% and 30%) and Lowest in October month 5 (11.90%). The result was presented in Table 5. Prevalence of bovine tropical theileriosis in cattle during July-to November-2021 was studied. The prevalence was higher mainly in July to August (33.33 percent and 30 percent respectively) while lower prevalence was recorded in October (11.90 percent). The higher prevalence in rainy (July to august) similar finding with Brahmbhatt et al. (2019) [5]. The lowest prevalence in October month similar finding with Dharaneshu et al. (2017) [9]. The reason may be due to high abundance of vector population during the monsoon season as compared to other seasons in a year (Ananda et al., 2016) [4].

### Conclusion

The overall prevalence of bovine tropical theileriosis amongst cattle was found to be 20.69 percent. The prevalence was higher irrespective of age from 0 to 6 month (33.33%), sex (23.00% in female), Breed (27.50% in Cross breed), Month July and August (33.33% and 30.00%) while lower prevalence irrespective of age above 2 year (17.28%), sex (15.55% in male), breed (12.30% in non-descript), month October (11.90%) was recorded.

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