PREVALENCE OF HAEMOPROTOZOA INFECTIONS IN PYRETIC DAIRY ANIMALS OF EASTERN HARYANA

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ABSTRACT

The examination of stained blood smears from pyretic cross bred cows (3041) and buffaloes (3122) of Eastern Haryana from July, 2003 to June 2010 revealed significantly higher infection in cows (27.88%) than buffaloes (0.6%). The pyretic cross-bred cows had *Theileria annulata* (22.88%), *Trypanosoma evansi* (0.33%), *Babesia bigemina* (3.22%) and *Anaplasma marginale* (1.45%) whereas buffaloes (3122) had *T.evansi* (0.32%) and *B. bigemina* (0.32%) only. Percentage of pyretic cows detected positive for *T.annulata*, *B.bigemina* and *A.marginale* was high from 2006-09 (27.6 to 32.8%), 2007 – 09 (3.91 to 5.60%) and 2006-10 (0.87 to 2.7s%), respectively. Seasonwise *T.annulata* and *B.bigemina* were recorded in higher percentage of cross-bred cows during summer (9.7 and 1.6%) and rainy season (9.2 and 1.1%). Lower values of haemoglobin, packed cell volume and total erythrocytic counts in haemoprotozoan infected cross bred cows revealed anemia. The results of these observations suggest proper diagnosis of pyretic animals before undertaking therapeutic measures.

Keywords: Haemoprotozon infection, Phratic dairy animals.

INTRODUCTION

Haryana, one of the northern states of India, is located between 27°37' to 30°35' N latitude and between 74°28' and 77°36' E longitude. The climate of Haryana is very hot in summer (up to a high of 50° C) and cold in winters (down to a low of 1° C) and the hottest months are May and June and the coldest being December and January. Rainfall is varied, with the Shivalik Hills region being the wettest and the Aravali Hills region being the driest and about 80% of the rainfall occurs in the monsoon season and sometimes causes local flooding. Cattle (15, 52, 361) and buffaloes (59, 53,228) being the main constituents of dairy farming in Haryana (Livestock census, 2007) have been reported to suffer from haemoprotozoan infections resulting from the bite of ticks and tabanids. These infections are responsible for causing pyrexia, anaemia, loss in body weight, decrease in milk yield and thus lead to severe economic losses to livestock owners (Suryanarayana, 1990). The present communication presents data on the prevalence of haemoprotozoan infections in pyretic cross-bred cows and buffaloes of Eastern Haryana.

MATERIALS AND METHODS

Blood samples from cross-bred cows (3041) and buffaloes (3122) were collected in anticoagulant (Ethylene diamine triacetate, EDTA @1-2 mg/ml of blood) and brought to LLR University of Veterinary and Animal Sciences, Veterinary Unit Substation TVCC, Karnal. Blood smears were prepared on clean glass slides and stained with Leishman/Giemsa stain by the standard technique. The stained blood smears were examined for the presence of haemoprotozoan infections. The haemoprotozoa were identified to species level as per morphological characters described by Soulsby (1982). Haematological parameters including haemoglobin (Hb gm %), packed cell volume (PCV %) and total erythrocytic cells (TEC x 10^6) were also determined as per method of Schalm (1965). The obtained data of haemoprotozoan infections was pooled season-wise i.e winter (November to February), summer (March to June) and rainy (July to October) and analyzed statistically with $X^2$ as per method of Snedecor and Cochran (1994). Annual rainfall in mm data was obtained from local observatory of CCS, Haryana Agricultural University, Regional Research Station, Uchani (Karnal).
RESULTS AND DISCUSSION

Pyretic cows (27.88%) had significantly (P< 0.01) much higher infection of *T. annulata* (22.88%), *Babesia bigemina* (3.22%), *Anaplasma marginale* (1.45%) and *Trypanosoma evansi* (0.33%) than buffaloes (0.6%) having infection of *B. bigemina* (0.32%) and *T. evansi* (0.32%) only (Table 1 and Fig. 1, A to D). Pyrexia in dairy animals results from several etiological factors including haemoptozoan infections (Blood and Radostits, 1989). The buffaloes have generally been reported with lower infection of haemoprotozoa than cross-bred cattle from Gujarat (Vohra et al., 2012). It can be deduced from the present and past studies from cross-bred cows and buffaloes of Northern India including Haryana (Yadav et al., 1985, Chaudhri et al., 1995., Singh et al., 1995), Punjab (Aulakh et al., 2005) and Himachal Pradesh (Jithendaran, 1997), bovine calves of semi arid region from Rajasthan (Godara et al., 2010), cattle from Northern Kerala (Nair et al., 2011) and cross-bred cattle and buffaloes of Kaira and Anand districts of Gujarat (Vohra et al., 2012) that haemoprotozoan diseases are widely prevalent in large population of dairy animals and thus affect milk production to a larger extent.

*Babesia bigemina* was significantly (P< 0.01) higher in cross-bred cows (3.22%) than in buffaloes (0.32%) (Table 1). Rare parasitaemia and seroprevalence for *B. bigemina* has also been recorded in buffaloes from endemic areas of Uttar Pradesh (Mishra et al., 1998 and Harkirat et al., 2007). Though fatal cases of babesiosis have been recorded in Murrah buffaloes from Eastern Haryana (Sangwan et al., 2003), the parasitaemia is low on most of the occasions and the animals remain carrier.

The year-wise prevalence of *T. evansi*, *T. annulata*, *B. bigemina* and *A. marginale* and

### TABLE 1: Prevalence of haemoprotozoan infections in pyretic cows and buffaloes of Eastern Haryana (2003-2010).

<table>
<thead>
<tr>
<th>Animal Exam.</th>
<th>No. Exam.</th>
<th>No. +ve (%+ve)</th>
<th>Number positive samples (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>T. evansi</td>
</tr>
<tr>
<td>Cattle</td>
<td>3041</td>
<td>848 (27.88)</td>
<td>10 (0.33)</td>
</tr>
<tr>
<td>Buffaloes</td>
<td>3122</td>
<td>20 (0.6)</td>
<td>10 (0.32)</td>
</tr>
<tr>
<td>Total</td>
<td>6477</td>
<td>868 (13.40)</td>
<td>20 (3.08)</td>
</tr>
<tr>
<td>X² values</td>
<td>-</td>
<td>1036.07*</td>
<td>0.97</td>
</tr>
</tbody>
</table>

* X² values significant at 1% = 3.841 and at 5% = 6.635

### TABLE 2: Seasonal incidence of hemoprotozoan infections in dairy animals of Eastern Haryana (July, 2003 to June, 2010).

<table>
<thead>
<tr>
<th>Animal Exam.</th>
<th>No. Exam.</th>
<th>Seasons of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Winter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. +ve</td>
</tr>
<tr>
<td>C</td>
<td>3041</td>
<td>121</td>
</tr>
<tr>
<td>B</td>
<td>3122</td>
<td>121</td>
</tr>
<tr>
<td>Total</td>
<td>6477</td>
<td>242</td>
</tr>
</tbody>
</table>

* X² values significant at 1% = 3.841 and at 5% = 6.635; C: Cows, B: Buffaloes

Winter = November, December, January, February; summer = March, April, May, June;
Rainy = July, August, September, October

*Te* = *Trypanosoma evansi*, *Ta* = *Theileria annulata*, *B.b* = *Babesia bigemina*, *A.m* = *Anaplasma marginale*
Annual rainfall (mm) has been presented in Fig. 2. Further analysis of this data showed that percentage of pyretic cows detected positive for *T.annulata*, *B.bigemina* and *A.marginale* was high from July, 2006 to June, 2009 (27.6 to 32.8%), July 2007 to June, 2009 (3.91 to 5.60%) and July, 2006 to June, 2010 (0.87 to 2.70%), respectively. Annual rainfall (>400 mm each year) did not correlate with the incidence of *T.annulata*, *B.bigemina* and *A. marginale* in cross-bred cows of Eastern Haryana (Fig. 2). These infections are tick transmitted and ticks are more active during warm weather provided there is sufficient rainfall (Urquhart et al., 1987).
Therefore, it can be concluded that rainfall alone cannot be correlated with the incidence of these infections. Season-wise infection of *T. annulata* and *B. bigemina* was higher in summer (9.7% and 1.6%) and in rainy season (9.2% and 1.1%) than in winter season (Table 2). Similar reports were made from Karnataka (Anandan et al., 2009) and Gujarat (Vohra et al., 2012). High prevalence can be correlated to the high activity of their tick vectors during summer and rainy seasons (Sangwan et al., 1995, Anandan et al., 2009 and Vohra et al., 2012). Lower mean± Sd values of haemoglobin (Hb gm %), packed cell volume (PCV %) and total erythrocytic counts (TEC x106) in *T. annulata*, (5.2± 1.6gm, 16.4±5.5% and 2.8± 1.1), *B. bigemina* (5.2± 1., 15.2±4.4% and 2.6±0.8gm%) and *A. marginale* (4.8±1.gm %,14.1±5.4% and 2.3±1.2) in infected cross-bred cows than in healthy ones (10.8±1.5gm%, 32.9±5.5% and 5.9±0.9) indicate anaemia, which is one of the characteristic clinical signs of these diseases (Ruprah, 1985).

It can be concluded from these studies that pyrexic dairy animals should be examined for the presence of haemoprotezoan infections prior to therapeutic measures to avoid unnecessary use of antibiotics /antiprotozoals.

REFERENCES


