Prevalence of Equine Piroplasmosis in and Around Junagadh in Horses

MJ Bharai, JS Patel, VL Parmar, UD Patel, DT Fefar

ABSTRACT

Equine piroplasmosis (EP), also called babesiosis, is a notifiable disease of equines. In the early nineties, equine piroplasmosis was not recognized as a different disease and was often confused with other diseases of equines. To be familiar with the epidemiological status of equine piroplasmosis in horses, retrospective information was retrieved by scrutinizing the data bank of the Teaching Veterinary Clinical Complex, Junagadh for two years (Jan 2017 to Dec 2018) covering 711 equine cases. According to symptoms, the incidence of equine piroplasmosis was 20.00% (41/205) among equine medicinal cases (205/711; 28.83%), of which 63.41% (26/41) were confirmed on blood smear examinations. Symptomatically, the age-wise incidence was higher in adult horses (68.29%), followed by yearlings (17.07%). The breed-wise incidence of equine piroplasmosis was higher in Kathiawari breed (53.65%), followed by Marwari (26.83%) and non-descript (12.20%). The sex-wise incidence was higher in females (85.37%). The season-wise incidence of equine piroplasmosis was the highest during summer (39.02%), followed by monsoon (36.59%) and winter (24.39%). The highest occurrence was in June. The findings showed the susceptibility of age, breed, sex of horses, and the seasonal influence on the prevalence of equine piroplasmosis for anticipated preventive measures.

Keywords: Babesia caballi, Babesia equi, Equine piroplasmosis, Kathiawari, Marwari.

INTRODUCTION

Animals of family Equidae have been used since time immemorial by man as a means of transportation and as a draft animal to transport goods and plow fields. Equine piroplasmosis also called babesiosis, is a notifiable disease of equines. In the early nineties, equine piroplasmosis was not recognized as a different disease and was often confused with other diseases of equines. The first recorded case of equine piroplasmosis was in South Africa in 1901 as an anthrax fever or biliary fever and equine malaria (Henning, 1949). The disease is distributed worldwide and endemic throughout Asia, many parts of Europe, Arabia, South, and Central America, except in some countries like Siberia, Australia, New Zealand and Japan (Karetepe et al., 2009). Equine piroplasmosis caused by T. equi is endemic in India (Kumar et al., 2012), but only isolated clinical cases have been reported (Sharma et al., 1982). In India, an equine piroplasmosis outbreak was reported from Hissar due to imported horses from endemic zones (Gautam and Dwivedi, 1976). T. equi infection is widely prevalent in different geographical parts of India, including Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh, Madhya Pradesh, Maharashtra and Chandigarh (Kumar et al., 2012).

A high percentage of seroprevalence was reported in the Gujarat plain and hills region (50.23%), Trans Gangetic region of Haryana, Punjab, and Chandigarh (42.09%) and western dry region of Rajasthan (38.54%). An antibody-ELISA based study in eight agro-climatic zone of India showed maximum seroprevalence (50.23%) in equids of Gujarat state with an overall seroprevalence of 32.65% in India (Kumar et al., 2012). The prevalence of the disease has attained worldwide importance due to the widespread association with tick as vector (Brooks, 1998). Looking to the scarcity of such information for equine piroplasmosis in Kathiawari horses in Gujarat, this study was taken up in and around Junagadh.

MATERIALS AND METHODS

To know the epidemiological status of equine piroplasmosis in horses, the information based on age, breed, sex, etc. pertaining to the cases presented at college hospital was...
collected and analyzed. Last two years (January, 2017 to December, 2018) retrospective information as mentioned above were retrieved by scrutinizing the data bank of the Veterinary Clinical Complex, College of Veterinary Science and AH, JAU, Junagadh. These data were suitably analyzed and appropriately inferred to establish the clinical as well as the epidemiological status of equine piroplasmosis in and around Junagadh district in Gujarat.

**RESULTS AND DISCUSSION**

**Overall Incidence**

A total of 11542 new cases of different ailments in various livestock and pet species were registered at VCC, JAU, Junagadh during a period of two years (Jan 2017- Dec 18). Out of these, 711 (6.16%) cases were of horses. Among them, 205 (28.83%) cases were of medicinal disorders and 41 (20.00%) of them showed the symptoms of hemoprotozoan disease. Among these 41 suspected cases of hemoprotozoan disease, 26 (63.41%) horses showed clinical signs of equine piroplasmosis and were found positive on blood smear examination.

**Age-wise Incidence**

Among 711 cases of horses registered, 49 (6.89%) were foal (0-12 month), 64 (9.00%) were yearlings (1-2 years), 589 (82.84%) were adult (2-18 years) and 09 (1.27%) were aged (above 18 years). Symptomatically, the age-wise incidence rate of equine piroplasmosis was higher in adult horses (68.29%) followed by yearling (17.07%), foal (9.76%), and aged (4.88%) horses (Table 1). According to blood smear examination of suspected horses, wherein the incidence rate of babesiosis was 57.69% in Kathiawari breed, followed by 26.92% in the Marwari breed, 11.54% in non-descript, and 3.84% in Sindhi breed. Indian Thoroughbreds were found negative for equine piroplasmosis.

**Breed-wise Incidence**

Retrospectively according to symptoms prevalence of equine piroplasmosis was higher in Kathiawari breed (53.65%) followed in descending order in Marwari (26.83%), non-descript (12.20%) and Sindhi (7.31%) breed (Table 2). A similar trend was also observed on a blood smear examination of suspected horses, wherein the incidence rate of babesiosis was 57.69% in Kathiawari breed, followed by 26.92% in the Marwari breed, 11.54% in non-descript, and 3.84% in Sindhi breed. Indian Thoroughbreds were found negative for equine piroplasmosis.

A higher incidence of equine piroplasmosis in Kathiawari breed of horses, as observed in the present study may be due to the larger population in this area than any other breed among the total cases surveyed. Breed wise incidence of infection might depend on the immune status of animals and management practice followed by the owner. It could be further investigated along with the immunological background of different breeds, serological and molecular surveillances and their susceptibility to the diseases for more accurate diagnosis and genetic makeup.

**Sex-wise Incidence**

Among 711 cases of horses registered, 610 (77.11%) were female and 101 (22.89%) were male. The sex-wise incidence of equine piroplasmosis was higher in females (85.37%; 35/41) compared to males (14.63%; 6/41). According to blood smear examination of suspected horses, wherein the incidence rate of babesiosis was 63.41%, the higher incidence rate was confirmed in adult horses (76.92%) followed by yearling (15.38%), whereas 7.69% incidence was recorded in foal and no confirmed case was recorded in aged horses.

**Table 1: Age-wise prevalence of equine piroplasmosis in Saurashtra region**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Foal (&lt;1 y)</th>
<th>Yearling (1-2 yrs)</th>
<th>Adult (2-18 yrs)</th>
<th>Aged (&gt;18 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total horses (n = 711)</td>
<td>49 (6.89%)</td>
<td>64 (9.00%)</td>
<td>589 (82.84%)</td>
<td>09 (1.27%)</td>
</tr>
<tr>
<td>No. of horses showed symptoms (n=41) (5.76% of the total horses)</td>
<td>04 (9.76%)</td>
<td>07 (17.07%)</td>
<td>28 (68.29%)</td>
<td>02 (4.88%)</td>
</tr>
<tr>
<td>No. confirmed by Smear examination (n=26) (63.41% of the suspected horses)</td>
<td>02 (7.69%)</td>
<td>04 (15.38%)</td>
<td>20 (76.92%)</td>
<td>00</td>
</tr>
</tbody>
</table>

**Table 2: Breed-wise prevalence of equine piroplasmosis in Saurashtra region**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Kathiawari</th>
<th>Marwari</th>
<th>Non-descript</th>
<th>Thoroughbred</th>
<th>Sindhi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total horses (n = 711)</td>
<td>457 (64.28%)</td>
<td>172 (24.19%)</td>
<td>69 (9.70%)</td>
<td>06 (0.84%)</td>
<td>07 (0.98%)</td>
</tr>
<tr>
<td>No. of horses showed symptoms (n = 41) (5.76% of total horses)</td>
<td>22 (53.65%)</td>
<td>11 (26.83%)</td>
<td>05 (12.20%)</td>
<td>00</td>
<td>03 (7.31%)</td>
</tr>
<tr>
<td>No. confirmed by blood Smear (n = 26) (63.41% of suspected horses)</td>
<td>15 (57.69%)</td>
<td>07 (26.92%)</td>
<td>03 (11.54%)</td>
<td>00</td>
<td>01 (3.84%)</td>
</tr>
</tbody>
</table>
Prevalence of Equine Piroplasmosis in and Around Junagadh in Horses

Table 3: Season-wise prevalence of equine piroplasmosis in Saurashtra region

<table>
<thead>
<tr>
<th>Particular</th>
<th>Monsoon (July-Oct)</th>
<th>Winter (Nov-Feb)</th>
<th>Summer (Mar-June)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total horses (n=711)</td>
<td>215 (30.23%)</td>
<td>235 (33.05%)</td>
<td>261 (36.71%)</td>
</tr>
<tr>
<td>No. of horses showed symptoms (n=41) (5.76% of the total horses)</td>
<td>15 (36.59%)</td>
<td>10 (24.39%)</td>
<td>16 (39.02%)</td>
</tr>
<tr>
<td>No. confirmed by Smear examination (n=26) (63.41% of suspected horses)</td>
<td>11 (42.31%)</td>
<td>02 (7.69%)</td>
<td>13 (50.00%)</td>
</tr>
</tbody>
</table>

examination also the incidence rate of equine piroplasmosis was higher in the females (84.62% 22/26) than the males (15.38%; 4/26). Almost identical findings were also observed by Javed et al. (2014) and Bhojani (2016), who reported that the males and geldings were less affected than the females. The reason for the difference was probably due to the larger population of females than males and geldings, and the management factors.

Month-wise Incidence

The clinically positive cases were recorded higher (21.95%) during the month of June, and the prevalence decreased in the month of August (12.20%) followed by July (9.76%) and in April, May, September, October, November, and December (7.32% each). Incidence was 4.88% each during January, February, and March. Similar trend of month-wise rate was also reported based on blood smear examination. However, there were no positive cases of equine piroplasmosis in January and February. Most of the cases occurred from June to October, though some chronic cases occurred in April and May due to latent infection. Other possible factors for this bimodal peak could be loss of body vigor of horse because of stress conditions in the winter and rainy season, insufficient exercise and close confinement, leading to more exposure of vectors.

Season-wise Incidence

Among 711 cases of horses registered, 215 (30.23%) were presented in the rainy season, 235 (33.05%) in the winter season, and 261 (36.71%) in the summer season (Table 3). The season-wise incidence of equine piroplasmosis recorded was higher in the summer season (39.02%), followed by monsoon season (36.59%), while it was lowest in the winter season (24.39%). According to the blood smear examination of suspected horses also, the incidence was higher in summer (50.00%) followed by monsoon (42.31%) and the lowest in the winter season (7.69%). Present findings are in agreement with Javed et al. (2014), who reported maximum cases in the summer season followed by monsoon season and lowest in the winter season. Thus the seasonal pattern of occurrence of equine piroplasmosis could be attributed to a conducive environment for the breeding of ticks.

CONCLUSION

A retrospective study of 711 horses presented at VCC Junagadh showed that 205 (28.83%) cases were of medicinal disorders, and 41 (20.00%) of them showed the symptoms of hemoprotozoan disease. Clinically 26 (63.41%) out of 41 suspected cases showed signs of equine piroplasmosis and were confirmed by blood smear examination. The prevalence of equine piroplasmosis was higher in adult horses in Kathiawari breed during summer season (March to June) due to a conducive environment for the breeding of vectors suggesting anticipated preventive measures to be taken to control the disease.

ACKNOWLEDGMENT

The authors gratefully thank the Dean of the College and the Junagadh Agricultural University authorities for the facilities provided for this work.

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