Prevalence of Cryptosporidium Infection in Dairy Calves of Hisar, Haryana

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ABSTRACT

A total of 80 calves including 37 diarrhoeic and 43 apparently healthy calves of University Livestock Farm, Hisar (India) were investigated for the presence of Cryptosporidium spp. through faecal examination. The overall prevalence in calves was 45%. However, higher prevalence rate was found in diarrhoeic calves (64.86%), < 1 month age group calves (69.23%) and cross-bred calves (50%).

Keywords: Calves, Cryptosporidium, Haryana, prevalence

Cryptosporidium spp. has been recognized as significant enteropathogens of a wide variety of vertebrate hosts including mammals, birds, reptiles and fish (Sargent et al., 1998). Cattle which harbour the parasite, constitute a major threat to public health. In immunocompetent hosts, the infection is acute and self-limiting, whereas in immunocompromised individuals it is chronic and persistent, and can lead to life-threatening chronic debilitating diarrhoea with dehydration, malabsorption, wasting and death (Griffiths, 1998). Infection rates are predicted to be highest in developing countries as well as in children (Fayer et al., 1997).

The study was conducted in calves of Haryana Agricultural University Livestock Farm located at Hisar during the period April to October 2007. Sahiwal and cross-bred calves of different age groups were selected.

A total of 80 faecal samples were collected directly from the rectum of each calf with a disposable plastic glove for every animal. Of these 37 samples were from diarrhoeic and 43 from non-diarrhoeic calves. The samples were put into individual, clean plastic containers and all the samples were processed on the same day of collection. For epidemiological investigations age, breed and clinical status of the calves were taken into consideration.

Concentration of oocyst was obtained by floatation method (Bhatia and Shah, 2001) using Sheather’s sugar solution having a specific gravity of 1.18 and the oocysts were examined under microscope in 400x magnification. The oocysts were then stained by modified Kinyoun’s acid fast staining (Current and Garcia, 1991) for proper identification of oocysts in 1000x magnification. The oocysts appeared as red pink spherical or ovoid bodies against a blue or green background, usually of about 4.5 - 5 µm in diameter.

Overall prevalence of Cryptosporidium in calves was 42.5%. The prevalence in diarrhoeic and non-diarrhoeic calves was 64.86% and 23.25%, respectively. Prevalence of infection was higher in young calves of < 1 month age group in both diarrhoeic (77.77%) and non-diarrhoeic (50%) calves as well as among various breeds (Table 1). Cross-bred calves exhibited higher...
Table 1: Prevalence of Cryptosporidium species infection among dairy calves in Hisar, Haryana, India.

<table>
<thead>
<tr>
<th>Age group in months</th>
<th>No. of animals examined</th>
<th>No. of diarrhoeic animals</th>
<th>No. (%)</th>
<th>Non-diarrhoeic animals</th>
<th>No. (%)</th>
<th>Total Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1</td>
<td>13</td>
<td>9</td>
<td>7 (77.77)</td>
<td>4</td>
<td>2 (50)</td>
<td>69.23</td>
</tr>
<tr>
<td>1-3</td>
<td>9</td>
<td>5</td>
<td>3 (60)</td>
<td>4</td>
<td>1 (25)</td>
<td>44.44</td>
</tr>
<tr>
<td>3 -6</td>
<td>30</td>
<td>13</td>
<td>9 (69.23)</td>
<td>17</td>
<td>5 (29.41)</td>
<td>46.66</td>
</tr>
<tr>
<td>6 -9</td>
<td>17</td>
<td>6</td>
<td>3 (50)</td>
<td>11</td>
<td>1 (9.09)</td>
<td>23.52</td>
</tr>
<tr>
<td>&gt; 9</td>
<td>11</td>
<td>4</td>
<td>2 (50)</td>
<td>7</td>
<td>1 (14.28)</td>
<td>27.27</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>37</td>
<td>24 (64.86)</td>
<td>43</td>
<td>10 (23.25)</td>
<td>42.5</td>
</tr>
</tbody>
</table>

Cryptosporidium positive diarrhoeic samples showed watery, semisolid and pasty consistency with foul odour and the colour varied from light yellowish to clay coloured. diarrhoeic animals were weak, debilitated and anorectic. Cross-bred calves appeared with pot belly and rough hair coat. Similar clinical status of calves with Cryptosporidium infection is reported earlier (Das et al., 2004).

Cryptosporidiosis is mainly responsible for diarrhoea in bovines in India and the young calves are most vulnerable for the infection (Roy et al., 2006). The prevalence of the infection in the present study (42.5%) was comparable to earlier work by Jose et al. (2002) from Spain. Cryptosporidium spp. was detected more in diarrhoeic calves (64.86%) in comparison to non-diarrhoeic calves (23.25%) as has been reported earlier by Das et al. (2004). Higher prevalence in calves of <1 month age group (69.23%), both in diarrhoeic and non-diarrhoeic calves, may be due to low level of immunity and sudden exposure of young calves to heavily contaminated environment (Roy et al., 2006). Cross-bred calves exhibited higher prevalence in this study. The results are in accordance with the findings of Shobhamani and Singari (2006).

References


Detection of Rabies Virus Antibodies in Vaccinated and Unvaccinated Stray Dogs in Mumbai City

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ABSTRACT

A total of 50 blood sera samples, including 25 samples each of unvaccinated stray dogs and dogs which received pre-exposure prophylaxis 2-6 month before sampling, were collected from animal welfare centers situated in Mumbai city. The sera samples were subjected to counter immuno electrophoresis (CIEP) test. CIEP titers ranged from 1:4 to 1:64 in 24/25 vaccinated dogs. However, 10/25 unvaccinated dogs, showed rabies antibodies titers, of which 5 had higher (1:8) antibodies titers, indicating the prevalence of rabies in the stray dogs.

Keywords: Antibody, blood, CIEP, dog, prophylaxis, rabies, serum.

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Rabies continues to be a serious health hazard in developing countries, including India. Dog is the principal transmitter of infection to man and animals, and 96% of human cases in India occur due to dog bite only (Sehgal and Bhatia, 1985). Analysis of data pertaining to the source of the rabies infection in human beings in India shows that practically all the cases are from bites of dogs, cats, wolves, foxes, mongooses and hyenas. It becomes mandatory to scrutinize the unvaccinated stray dog population which may harbour the virus symptomatically. Also, the sero-surveillance of vaccinated dogs for the presence of virus neutralizing antibodies is essential to monitor the efficacy of anti-rabies vaccination.

The specific neutralizing antibodies to rabies virus can be detected by complement fixation test (CFT), serum neutralization (SN) test, counter immuno electrophoresis (CIEP) test and haemagglutination inhibition (HI) test. The CIEP technique is a well established technique for the purpose of detection of antigen/antibodies of rabies (Diaz and Varela, 1977). The present study was undertaken with the objective to scrutinize stray dogs for the presence of rabies virus by detection of virus antibodies in unvaccinated and vaccinated stray dogs.

Twenty five dog sera samples, each from vaccinated and unvaccinated dogs were collected from the Welfare of Stray Dogs Association, Mahalaxmi, Mumbai and the Bai Sakarbai Dinshaw Petit Hospital for Animals, Parel, Mumbai. In case of vaccinated dogs, blood sera samples were collected from those dogs which received pre-exposure prophylaxis treatment 2-6 month before sampling.

The test was carried out on clean, grease free glass slide measuring 75 mm x 25 mm. Noble agar (1 g) was dissolved in 100 ml of barbitone buffer (0.1 M, pH 8.6) and slides were prepared using 2.8 to 3.0 ml molten agar per slide. Four pairs of wells of 2.5 mm diameter, each placed
3.0 mm apart were punched in two parallel rows maintaining minimum 5.0 mm distance between the rows. The cavities were positioned from each other at an angle of 25°.

The slides were placed in the electrophoretic tank after loading the well with sera samples and standard known antigen. The serum cavities were directed towards anode, connected with the help of filter paper wicks. Electrophoresis was carried out at a potential difference of 150 V for 30 min, and for a further period of 3 min at a potential difference of 50 V. Then slides were incubated at room temperature in a humidity chamber in order to prevent drying of the gel. Results were read immediately and after 12 h. The slides were stained with 0.5% amido black solution for future reference. Plates showing precipitation band between the two wells/cavities was considered as a positive test.

The CIEP results revealed that antibody titers of the vaccinated dogs were found in the range of 1:4 to 1:64, except one dog (no. 22) who did not show development of rabies antibodies although the same dog was in an apparently healthy condition. In a survey carried out by Trepsumethanon et al. (1991) using rapid fluorescent focus inhibition test to determine serum neutralizing antibodies to rabies virus in Thai dogs found 42% of the dogs with no detectable rabies antibodies. Similar observations were also recorded by Afshar and Bahmanyar (1978) in their review of non fatal rabies virus infections. Reasons for failures to develop antibodies after vaccination are many, such as, heavy worm load during vaccination (also common in human cases), animals undergoing some sort of stress condition e.g. short intervals between primary and booster vaccinations resulting into vaccination stress, radiation therapy or cortico- steroid treatment within a few days of vaccination, and animals in stage of incubation of rabies or other viral diseases, wherein the immune system does not respond as in normal animals.

Out of 25 unvaccinated dogs, 10 dogs (40%) showed rabies antibody titers of which 5 dogs (no. 3, 4, 5, 7 and 8) showed high antibody titers (1:8), indicating the prevalence of rabies in this group of dogs. The antibody response was indicative of latent rabies virus infection which can either develop into a full blown disease or be suppressed and lead to a latent carrier state. These results are in agreement with Bell (1964) and Fekadu and Baer (1980) who encountered several such cases, where unvaccinated animals had titers.

Thus, in the present study 40% of the unvaccinated dogs showed rabies virus infection and they could be considered as carriers for all practical purposes. The incidence rate observed in the present study is higher as compared to the incidence rate (16.1%) reported by Wosu and Anyanwu (1990) in unvaccinated stray dogs. However, incidence rate observed in the present study was lower than, 44% reported by Iroegebu and Uhuegbu (1992) and 80% by Mebatston et al. (1992).

References

