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Sero-prevalence of bovine herpes virus-1 (BHV-1) infection in cattle in organized farm

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Abstract

Bovine herpes virus-1 (BHV-1) responsible for Infectious Bovine Rhinotracheitis is one of the important viral pathogens causing severe economic loss to the cattle industries through the way of various clinical manifestations and especially via loss of production and abortions, this study was performed to understand the antibody prevalence to BHV-1 in different breeds and age group of cattle in an organized farm in Chennai, Primiparous and Pluriparous Cattle, different breeds of Cattle from Organized farm were assessed for the sero-prevalence of BHV-1 infection using Indirect Enzyme Linked Immuno Sorbent Assay (I-ELISA) technique, serum antibody prevalence of 45.45 per cent in Primiparous cattle and 62.06 per cent was recorded, among the breeds of cattle, the sero-prevalence of 45.83 per cent in Jersey Cross, 46.66 per cent in Non-descriptive, 70 per cent in Holstein Friesian Cross and 20 per cent in Hallikar were recorded respectively, the overall sero prevalence recorded in Organized farm was 52.12 per cent.

Keywords: I-ELISA, age-breed, bovine herpes virus -1 (BHV-1), cattle

Introduction

Infectious Bovine Rhinotracheitis (IBR), is a well described clinical syndrome, caused by bovine herpesvirus-1 (BHV-1). It is a potential viral pathogen of cattle responsible for remarkable economic losses to the livestock industries around the world. Infectious Bovine Rhinotracheitis is described under multispecies diseases (OIE, 2010), characterized by the development of an acute, contagious, severe respiratory, reproductive and nervous problems in cattle (Ganguly *et al.*, 2008 and Koppad *et al.*, 2007) [3, 4]. The disease is of worldwide in distribution and in India; the endemic prevalence of IBR has been extensively reviewed by Nandi *et al.* (2009). In addition to IBR, the virus also causes Infectious Pustular Vulvovaginitis (IPV) and Infectious Pustular Balanoposthitis (IPB) syndromes in cattle. Bronchopneumonia and mortality are the important complications caused by secondary bacterial infections (Winkler *et al.*, 2000).

Bovine herpes virus-1 (BHV-1) causes, severe economic loss to the cattle industries by various clinical manifestations and especially via loss of production and abortions (Ganguly *et al.*, 2008) [3] Sero-prevalence study has been carried out widely in India (Koppad *et al.*, 2007) [4].

Materials and Methods

A total of 40 serum samples from Organized farm was subjected to I-ELISA for Age wise Antibody Prevalence of BHV-I infection, out of 40 serum samples in Organized farm, 11 samples were collected from Primiparous Cattle and 29 samples were from Pluriparous cattle, similarly a total of 54 serum samples for Breed wise Antibody Prevalence of BHV-I were subjected to I-ELISA. Cattle breeds from Organized farm comprises of Jersey cross (24), Holstein Friesian cross (10), Hallikar (5) and Non-descriptive (15).

The age group of animal were divided into Primiparous and Pluriparous, likewise different breeds were categorized in Organized farms. The samples were analyzed and screen by Indirect Enzyme Linked Immuno-Sorbent Assay to assess the antibody prevalence against BHV-1 in cattle using I-ELISA antibody kit procured from SVANOVA Biotech, Uppasala, Sweden. Following I-ELISA antibody analysis the samples which showed the per cent positivity of > 18 were taken as Positive and samples with < 18 as Negative as per the OD value assessed by 450nm wavelength in spectrophotometer.

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The per cent positivity was calculated as given below.

$$\% \text{ Positivity} = \frac{\text{OD Test sample or Negative Control}}{\text{OD Positive Control}} \times 100$$

Results

The age wise antibody prevalence and Breed wise antibody prevalence of BHV-1 in Organized farm are furnished in table 1 and 2 given below.

Table 1: Agewise Antibody Prevalence of Bhv-1 in Organized Farm by I-Elisa

Age group	No. of animals screened	No. Positive	Per cent positive
Primiparous	11	5	45.45
Pluriparous	29	18	62.06
Total	40	23	57.5

Age wise, serum antibody prevalence of BHV-1 was 45.45 per cent (5/11) in Primiparous cattle and 62.06 per cent (18/29) in serum samples of Pluriparous cattle in organized farm respectively, the overall percent positive in organized farm was 57.5%.

Table 2: Breed wise Antibody Prevalence of Bhv-1 in Organized Farm by I-Elisa

Breeds	No. of animals screened	No. Positive	Per cent positive
Jersey Cross	24	11	45.83
Non-Descriptive	15	7	46.66
HF cross	10	7	70.00
Hallikar	5	1	20.00
Total	54	26	48.14

Among the breeds of cattle in the organized farm the sero-prevalence was 45.83 (11/24) per cent, 46.66 (7/15) per cent, 70 (7/10) per cent and 20 (1/5) per cent in Jersey Cross, Non-descriptive, Holstein Friesian Cross and Hallikar respectively, the overall percent positive in Organized farm was 48.14%.

Discussion

The mean per cent of age wise antibody prevalence in the organized farm was 45.45 per cent among Primiparous cattle and 62.06 per cent in Pluriparous cattle, Contrary to the findings that the age wise antibody sero prevalence was slightly higher in Pluriparous cattle, Chinchkar *et al.* (2002) [1] reported no significant difference between the sero-prevalence of BHV-1 and age groups of cattle in their study, however Suresh *et al.* (1992) [8] stated that the disease prevalence would increase as and when there was an age advancement in cattle. Rajesh *et al.* (2003) [6] also recorded a higher sero-prevalence in adult cattle compared to the prevalence in the younger ones. In agreement to this statement, Mc Dermott *et al.* (1997) [5] also reported there was a parallel increase of infection occurred with the age advancement.

The mean per cent of breed wise antibody prevalence in the Organized farm was 45.83 per cent in Jersey Cross, 46.66 per cent in Non-descript, 70.00 per cent in HF cross and 20.00 per cent in Hallikar respectively

Mohan *et al.* (1989) reported the sero prevalence of 18.60 per cent in Jersey Cross and 19.64 per cent in Holstein Friesian, this study also found a higher sero – prevalence of 70.0 per cent in HF Cross and comparatively lower 45.83 per cent in Jersey Cross, Koppad *et al.* 2007 [4]; Singh *et al.*, 1985 and Rajesh *et al.*, 2003 [6] found that the sero-prevalence was reported to be higher in HF cross compared to Jersey cross,

Koppad *et al.* (2007) [4] reported a lower per cent prevalence of 7.4 per cent in Non-descriptive cattle however in contrast to the present study findings 46.66 per cent in Non-descriptive cattle were found this could be attributed to mal-nutrition and lower hygiene practices in the farm premises.

Conclusion

In the present study a higher sero-prevalence was found in cattle among Pluriparous cattle, the breed wise finding showed a higher sero prevalence in HF cross followed by Non Descriptive cattle, Jersey cross and the least prevalence in Hallikar breed. Among the age group, Pluriparous cattle were found to show higher sero-prevalence than other young age groups or the Primiparous cattle which could be attributed due to heavy milk yield production stress in these cattle group in the organized farm, It is likely that the maintenance of close contact between the cattle, various stress related factors which included parturition and milk production could be the reason for the high prevalence of infection among Pluriparous cattle in organized farm, this study can be more specific in the future with uniformity of samples maintained among all age group and breed group as sample variations in the age groups and breed group of cattle may sometimes not depict the actual fact, Further molecular detection through PCR can be used for specific detection of BHV-1 infection as PCR is becoming an inevitable molecular technique used in the diagnosis of various diseases as it is more sensitive and more rapid than virus isolation technique.

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