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Sero-Diagnosis & Therapeutic Management of Infectious Bovine Rhinotracheitis Infection In Cattles

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Abstract

Infectious Bovine Rhinotracheitis (IBR) is highly infectious and economically important disease of bovines caused by Bovine Herpes virus type-1 (BHV-1).This virus runs latent course. Reactivation of the latent infection and intermittent shedding of the virus makes detection, diagnosis and control of IBR a difficult task.

The present study Diagnosis and Therapeutics management of Infectious Bovine Rhinotracheitis in Cattle was undertaken to detect the BHV-1 antibodies and shedding of BHV-1 virus through evaluation of competitive enzyme linked immunosorbent assay (c-ELISA), PCR in diagnosis and hematological alterations occurring in cases of seropositive cattle. For the present study, a total 209 blood and serum samples were collected from the cows preferably having history of lacrimation, nasal discharge, rhinitis, earlyand late gestation abortion and/or retention of placenta, metritis and pyometra. Thenumber of samples collected were 49, 42, 62 and 56 from Baramati, Alephata,Pandharpur and area around Shirwal, respectively. Blood was collected in EDTA vials and for serum collection sterile glass tubes were used and these samples were stored at -20˚C. Serological test performed for the purpose of diagnosis was;Competitive-Enzyme Linked Immunosorbent Assay (c-ELISA) by using ID Screen® IBR gB competition by ID.Vet Innovative Diagnostics and Polymerase Chain Reaction (PCR) for gB gene detection at 478bp. Further hematological studies was carried out on animals that were found positive after performing c-ELISA and parameters studied were Hb, PCV, TEL, TLC, DLC. In the present study, Molecular detection by PCR was carried out using gB gene primer having amplicon size of 478 bp. A total 49 seropositive samples were tested with gB gene primer. Primer set gB could not produce the desired amplicon of 478 basepair in all 49 whole blood sample.

Hematological Values of Hemoglobin (gm/dl) is (10.949 ± 0.284), PCV (33.100 ± 0.759), TEC (8.102 ± 0.242), TLC (9.406 ± 0.254). Values of DLC found were Neutrophil % (33.148 ± 0.763), Eosinophil % (8.698 ± 0.524), Basophil %(0.148 ± 0.053), Monocyte % (4.775 ± 0.233) and Lymphocyte % (52.260 ± 1.519).Hematological findings revealed no significant difference and all the values were in the reference range.There is no specific treatment for any Viral diseases hence use of Antibiotics to reduce secondary bacterial infection and giving Supportive treatment early recovry occurs. Proper Deworming and Vaccination reduce the disease occurance.

Key words:- Infectious Bovine Rhinotracheitis (IBR), ELISA, PCR, Cattle

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I. Introduction:-

Infectious Bovine Rhinotracheitis virus is an enveloped double stranded DNA (ds-DNA) virus belonging to the family herpesviridae. It is a highly infectious viral disease of cattle. IBR is also known by a variety of other names such as infectious pustular vulvovaginitis (IPV), coital exanthema, vesicular veneral disease, vesicular vaginitis, coital vesicular vaginitis, necrotic rhinitis and Red nose. There are five forms of IBR, namely respiratory form, vulvo-vaginal form, occular form, encephalomyelitic form and abortive form. Infectious bovine rhinotracheitis (IBR) has also been described as an acute, contagious, febrile infection of cattle which is characterized by an intense inflammation of the upper respiratory passages, trachea accompanied by dyspnoea, depression, nasal discharge and loss of condition The disease occurs more often in animals over six months of age.

Transmission of disease occurs normally by contact with infected animals, aerosol route and virus-contaminated semen from BHV-1 infected bulls (Saravanajayam *et al*., 2015). During the primary infection the viral DNA remains in the neurons of trigeminal ganglia in case of respiratory infection and sacral ganglion after genital infection for the entire life in the host (OIE, 2008). Stressful situation, such as transport, parturition, high

ambient temperature (in case of pure and cross-breeds), high milk yield and artificial stress induced by steroid injection cause reactivation of the latent virus from the ganglia and consequently intermittent shedding of virus into the environment thereby acting as a potent source of infection to other healthy cattle (Radostits *et al.,* 2000).Breed wise, the prevalence rate was highest in Holstein Friesian (9.80%) and lowest in Jersey Cross breed (1.96%).Several laboratory methods are available for BHV-1 detection like virus

Diagnosis :-

Various Microbiological and Molecular diagnostic tests like PCR,Real Time PCR, RT-PCR, Isolation, fluorescent antibody technique (FAT), enzyme linked immunosorbent assay (ELISA) is most reliable and least time consuming. Viral genomes in biological and clinical specimens can easily be detected by ELISA

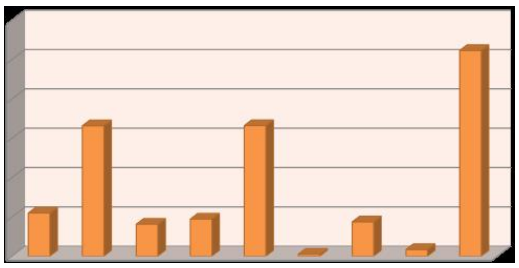
Average hematological values of seropositive animals

haematological values:-

Hb= Hemoglobin, PCV= Packed Cell Volume, TEC=Total Erythrocyte Count, TLC= Total Leucocyte Count

Haematological Parameter
Haemoglobin 8-15 g/dl
Packed Cell Volume 24-46 %
Total Erythrocyte Count 5-10x 10^6/L
Total Leucocyte Count 4-12x 10^3/ L
Neutrophil 25-45 %
Basophil 0-2 %
Eosinophil 2-20 %
Monocyte 2-7 %
lymphocyte 45-75 %

Average hematological values of Seropositive animals tested by c-ELISA



Treatment:-

There is no specific treatment for any Viral diseases hence use of Antibiotics to reduce secondary bacterial infection and giving Supportive treatment include Inj Ceftriaxone 4gm Intra muscularly, Inj NSAIDS Inj.Maxxtol @ 15 ml deepIntra muscularly, Inj Tribivet 20 ml Intra muscularly, Inj Avil 20ml Intra muscularly,Inj Ferritas 10 ml Intra muscularly only once in a week, Inj Vit C (Ascorbic Acid) @ 10 ml I/M once in a day for Ten days. Inj E Care Se 10 ml I/M and Liq Immunol 25 ml Orally Once in a day for Ten days to reduce Severity of Infection and early improvement.

Prevention :- Inj Ibrivac should be given @ 2ml s/c Route in heifers and Cows after Recommonded deworming.

The conclusions drawn from the present study are as below :

The diagnosis of IBR in cattle by c-ELISA is very sensitive and rapid and therapeutic management plays a great role in early recovery during latent infection.but Inj Ibrivac should be given @ 2ml s/c Route in heifers and Cows for better prevention and Control.

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Lacrimation from the animal which was test Seropositive

Plate 3: Serum samples Collected and stored at -20o C.

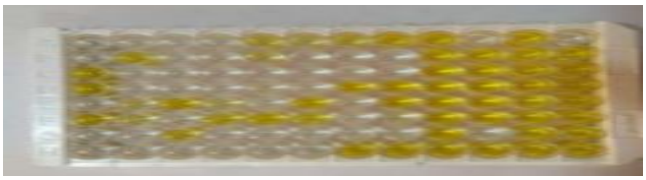

Plate 6: **ELISA module showing positive and negative reactions for BHV-1 antibody detection in cattle by Competitive ELISA**
Wells A1, B1: Positive Control
Wells C1, D1: Negative Control
Wells E1 to H12: Test serum samples
Yellow Coloured wells denotes absence of Antibodies Whereas no coloured wells denotes presence of antibodies.