

## INFECTIOUS BURSAL DISEASE (IBD): An Important Immunosuppressive Disease in Poultry

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### Introduction

- Infectious bursal disease is an acute, contagious, viral disease of young chickens characterized by diarrhea, vent picking, trembling, incoordination, inflammation followed by atrophy of the bursa of fabricius and by variable degrees of immunosuppression. The first cases were seen in area of Gumboro, United States of America, that why it is also known as “Gumboro disease”. IBD was first reported in Uttar Pradesh in India. Flocks are affected acutely and show variable morbidity (30%).

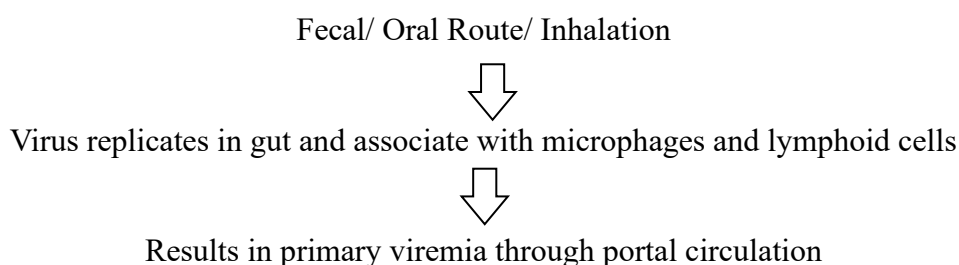
### Etiology

- It is caused by IBD virus (non-enveloped, icosahedral, bisegmented, dsRNA virus) that is a member of the genus AviBirnavirus of the family Birnaviridae.
- There are two serotypes of IBDV (serotypes 1 & 2). Strains of serotype 1 IBDV are pathogenic only in chickens.

### Transmission

- The most common mode of infection is through the oral route, Conjunctival and respiratory routes.
- It is also transmitted by direct or indirect contact with excreting subjects/ susceptible flocks. Infected birds excrete virus in their dropping at least for 14 days.

### Pathogenesis: (Flowchart representing the pathogenesis of IBD virus)





Virus spreads to bursal fabricus in 11 hours of post inoculation



Active replication of virus in bursal follicles and B cells



Spreads to bloodstream and causes secondary viremia



Leads to viral infection in organs like muscles, kidney causing pathognomic clinical signs and death



Affected birds are depressed and show recumbency, ruffled feathers and white diarrhea.

#### Clinical Signs:

- Clinical disease is observed only after 3 weeks of age. The incubation period is short and clinical signs were seen within 2-3 days after the exposure of IBD.
- Affected birds are depressed and show recumbency, ruffled feathers and white diarrhea.
- Occasionally there is voiding of blood and straining during defecation.
- Vent picking is common and may be self-inflicted.

#### Postmortem Lesions:

- Macroscopic lesions are observed principally in the bursa which is enlarged to about twice normal size.
- Hemorrhages are common in thigh, pectoral muscles and at the junction of the proventriculus and gizzard.



**Fig.: Enlargement of Bursa of Fabricus.**



**Fig.:** Characteristic subcutaneous and intramuscular hemorrhages associated with IBD disease.

#### Diagnosis:

- Diagnosis based on history and clinical signs, gross pathology, and histopathology.
- IBDV can be isolated in specific pathogen free embryonated eggs or on tissue culture.
- ELISA and virus neutralization will usually confirm the diagnosis.

#### Prevention & Control:

- As *Birnaviridae* is highly stable in nature, it is practically impossible to eradicate the source of IBDV infection once the rearing site got infected.
- Cleaning and disinfecting the sheds before chick's arrival, all-in all-out system and disinfection with formaldehyde and iodophors have shown effective improvement.
- Along with the general practice of treatment with 3 types of viral disinfectants, the combination of glutaraldehyde and QAC, phenolic compound and triple salt is the best way of disinfection treatment.
- Maintaining proper biosecurity measures and chicks from a good hatchery source will also reduce IBDV infection. Despite the hygienic measures, vaccination is unavoidable to prevent IBDV infection in poultry farm.

#### Vaccination:

- **Recommended schedule of vaccine for effective control of IBD:**
  - Chicken with low level of maternal antibodies: - at 1-2 weeks of age and second vaccination at 3-4 weeks of age.
  - Chicken with high level of maternal antibodies: - at 3-4 weeks of age and second vaccination at 8-12 weeks of age.
- **Methods/ Routes of Vaccination:**
  - **Eye drop method:** Eye drop method should be used for primary vaccination.



Use reconstituted vaccine immediately.

- **Drinking water method:** For drinking water method, before giving the vaccine, withhold the birds from drinking water for at least two hours to allow birds to get thirsty. However, variation in this can be done depending on the season.
- Killed oil-emulsion vaccines are effective in producing high levels of antibody in breeders, after priming with a live vaccine applied prior to the onset of lay.

#### Conclusion:

- The marked immunosuppression through IBDV causes the susceptibility of impaired response to vaccination. Hence, proper vaccination of chicks, especially the breeder flock, should be followed to maintain the MDA to their progeny. The only way to control IBD infection is by reducing the field virus exposure to poultry flock, disinfection treatment and developing strict biosecurity program in poultry farms.

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