

# INFECTIOUS BRONCHO-RHINITIS (IBR)

(Commonly known as: **Infectious Pustular Vulvovaginitis, Coital Exanthema**, vesicular venereal disease, vesicular vaginitis, coital vesicular vaginitis, coital vesicular exanthema, and Red Nose)

## INTRODUCTION & ETIOLOGY:

IBR is caused by herpes virus, termed '**bovine herpesvirus type-I** (BoHV-1)". After recovery of animal from disease, the virus remains latent in **sciatic and trigeminal ganglia**, and sheds periodically in a manner similar to that seen with herpesvirus of humans (herpesvirus simplex), monkeys (herpesvirus B), and dogs (herpesvirus canis).

Infectious Bovine Rhinotracheitis (IBR) is a highly infectious viral disease of cattle characterised by clinical signs of the upper respiratory tract, such as a (muco)purulent nasal discharge, hyperaemia of the muzzle (red nose disease) and by associated conjunctivitis, encephalitis, and mastitis. Signs of general illness are fever, depression, inappetence, abortions and reduced milk yield.

*The virus can also infect the genital tract and cause **infectious pustular vulvo-vaginitis** and **balanoposthitis** (inflammation of the glans penis and prepuce), abortion, and systemic infection in calves. Infectious bovine rhinotracheitis and infectious pustular vulvovaginitis are the most common manifestations.*

## SPREAD:

The main sources of infection are the nasal exudate and coughed-up droplets, genital secretions, semen and foetal fluids and tissues. Aerosol (droplet) infection is considered to be the method of spread of the respiratory disease. Venereal transmission is the method of spread of the genital diseases.

## PATHOGENESIS:

In the Respiratory Form, the virus multiplies in the nasal cavities and upper respiratory tract (URT), resulting in **rhinitis, laryngitis and tracheitis**. There is extensive **loss of cilia** in the trachea. This leaves the tracheal epithelium covered with microvilli. This adversely effects the defense mechanisms of respiratory tract. Virus spreads from the nasal cavities to the ocular tissues occurs through lachrymal ducts, and causes **Conjunctivitis**.

Spread from the nasal mucosa through the **Trigeminal Peripheral Nerve** to the **trigeminal ganglion** may occur, resulting in **non-suppurative encephalitis**. Systemic invasion by the virus is followed by localization of the virus in several different tissues. The virus may be transported by peripheral leukocytes to the **Placenta**, and transferred to the foetus to cause **ABORTION**. The foetus is highly susceptible to the IBR virus.

## SIGNS and LESIONS:

These are described under various clinical forms.

### (i) Respiratory Form

Young cattle are most susceptible, wherein the disease is highly infectious, with morbidity approaching 100% and mortality upto 10%. The symptoms begin with Fever, anorexia, and a mucous nasal discharge, which later becomes mucopurulent. Respiratory distress is noticeable by dilated nostrils, mouth breathing, dyspnoea, and coughing. Conjunctivitis often accompanies the respiratory form. The course is usually about 10 days.

The gross lesions are limited to the nasal passages, paranasal sinuses, trachea, and bronchi. Nasal and turbinate mucosae including paranasal sinuses are congested and oedematous and contain thick mucopurulent exudate, sometimes showing petechiae. The tracheal mucosa is also congested and covered with mucopurulent exudate, thereby decreasing the diameter of the lumen. Stenosis (narrowing) of the trachea contributes to the respiratory distress, and may result in death from asphyxia, or bronchopneumonia.

Microscopically, there is **necrosis** of respiratory mucosa with intense neutrophilic and mononuclear infiltration of the submucosa. The mucosa becomes **ulcerated** and has fibrin and necrotic debris. **Intranuclear inclusion bodies** are present in epithelial cells.

## (ii) Neonatal Form

During an outbreak of IBR, the infection in very young calves may **become generalized**. The condition is **acute and usually fatal**, with no signs of respiratory system involvement. Lesions consist of widespread focal necrosis in the respiratory epithelium, liver, kidney, spleen, lymph nodes, oesophagus, and forestomachs. Intranuclear inclusion bodies have been described in each of these tissues.

## (iii) Genital Form

In 1957, it was discovered that IBR virus also causes another bovine disease with very different manifestations. This disease, "**Infectious Pustular Vulvovaginitis**", has been known for many years as coital exanthema, vesicular venereal disease, vesicular vaginitis, coital vesicular vaginitis, or coital vesicular exanthema.

This infection involves mainly the female genital tract, but lesions may occur on male genitalia as well. Clinical signs in the cow appear within 24-72 hours after coitus with an infected bull. The mucosa of the vulva becomes reddened with **dark red punctate (pinpoint) foci**, which quickly **form into vesicles and pustules** (0.1-5.0 mm in diameter). The **pustules** soon form a **membrane** by fusion, which further gets detached and presents an underlying zone of **ulceration**. Vulva may be swollen. Affected bulls may have similar lesions on the penis and prepuce. Healing of all these lesions is complete in about 2 weeks. However, recurrent attacks may occur. Microscopically, the lesions consist of foci of **necrosis** of the mucosal epithelium with an associated inflammatory reaction. **Intranuclear inclusion bodies** develop within epithelial cells.

## (iv) Abortion

The IBR virus is also an important cause of **abortion in cattle**. The abortion usually occurs **after the Rhinotracheitis form of the disease**, and up to 60% of pregnant cows in a herd may abort. Although abortion may occur at any stage of pregnancy, it is **most common in the Third Trimester** (last three months). At the time of abortion, there is no visible clinical disease in the dam.

**Advanced postmortem autolysis** is the most striking gross finding in the foetus, which is **expelled 24-36 hours after intrauterine death**. Microscopically, characteristic lesions in the foetus consist of focal necrosis in liver, lymph nodes, spleen and kidney. **Intranuclear inclusion bodies** are found in these tissues.

The pattern of IBR abortion and the foetal lesions are remarkably similar to equine rhinopneumonitis abortion in mares. Both diseases are caused by herpesviruses.

## **DIAGNOSIS:**

A presumptive diagnosis of any form may be made on the basis of characteristic clinical signs, and demonstration of necrotizing lesions containing **intranuclear inclusion bodies**.

The diagnosis may be confirmed by isolation and characterization of the virus.

The virus can be detected in nasal swabs by the use of **ELISA**, direct and **indirect IFAT** or **immunoperoxidase**.

**Indirect Haemagglutination Test**, and **Virus Neutralization** test are also used.

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