

Infectious Bovine Rhinotracheitis in Indian Bovines: The Hidden Viral Infection

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doi.org/10.5281/VeterinaryToday.22827981

Abstract

Infectious bovine rhinotracheitis (IBR) is an important viral disease of cattle and buffaloes caused by bovine alphaherpesvirus-1 (BoAHV-1). It mainly causes respiratory disease but can also affect reproduction and cause abortion. Recent Indian studies have demonstrated widespread exposure to the virus in bovine populations. A key feature of IBR is the ability of the virus to remain latent in infected animals and reactivate later. This article briefly discusses IBR, its occurrence in Indian bovines, clinical signs, diagnosis and control.

Keywords: Cattle, buffalo, bovine alphaherpesvirus-1, IBR, respiratory disease, abortion, latency

Why Is IBR Important in India?

Cattle and buffaloes are central to India's dairy sector, making diseases that affect their health and reproduction economically important. IBR is one such disease. It has been recognised in India for several decades and has been reported from different regions of the country [1,2]. Recent studies continue to demonstrate exposure to IBR among Indian bovines. A 2024 study involving 1,000 buffalo serum samples collected from ten major milk-producing states reported an overall seropositivity of 43.3%, with considerable variation between states [3].

What Happens During IBR Infection?

IBR mainly affects the upper respiratory tract. Infected animals may develop fever, depression, loss of appetite, coughing, nasal discharge and conjunctivitis. The nasal passages may become intensely red and inflamed. However, not every infected animal develops obvious disease. Some animals show mild signs or remain apparently healthy, making clinical observation alone insufficient for identifying infected animals.

IBR in Indian Cattle and Buffaloes

Recent Indian studies indicate widespread exposure to IBR among bovines. A 2024 national study tested 1,000 buffalo serum samples from ten major milk-producing

states and detected IBR antibodies in 43.3% of animals. Seropositivity ranged from 27% in Andhra Pradesh to 58% in Punjab, indicating that exposure to IBR occurs across different regions of India [3].

Is IBR Only a respiratory disease?

Despite its name, IBR can affect more than the respiratory system. BoAHV-1 can infect the reproductive tract and may cause inflammation, reproductive problems and abortion. In bulls, infection can affect the penis and prepuce, while females may develop genital inflammation. An Indian study investigating cattle and buffaloes with reproductive disorders detected BoAHV-1 DNA using PCR, including in animals presented with abortion [4]. This highlights the importance of considering IBR when investigating reproductive problems in dairy animals.

What Does an IBR Outbreak Look Like?

An IBR outbreak can cause fever, conjunctivitis, respiratory distress and nasal discharge in affected cattle or buffaloes. In a 2025 Indian buffalo-farm outbreak, BoAHV-1 was confirmed by PCR, highlighting the importance of laboratory diagnosis during outbreaks.

The Virus That Can Hide

One of the most important features of

BoAHV-1 is its ability to establish latent infection. After the initial infection, the virus can enter sensory nerve tissue and remain dormant. Following respiratory infection, latency commonly occurs in the trigeminal ganglia, while genital infection may lead to latency in the sacral ganglia [1]. The animal can therefore recover and appear healthy while the virus remains inside its body.

In simple terms:

Infection → clinical disease → recovery → virus becomes latent → animal appears healthy → virus can reactivate

This ability to remain hidden is one of the major challenges in controlling IBR.

When Can the Hidden Virus Return?

Latent virus can reactivate when the animal experiences stress or other conditions that affect its normal physiological state. Transport, changes in management and other stressful situations can contribute to reactivation [5]. Following reactivation, the virus can travel back towards the tissues and be shed through secretions. Importantly, viral shedding does not always have to be accompanied by obvious clinical disease. This means that an apparently healthy animal can potentially contribute to the spread of infection within a herd.

How Can IBR Be Diagnosed?

Clinical signs can suggest IBR, but laboratory diagnosis is important because several respiratory and reproductive diseases can produce similar symptoms. Samples from the respiratory or reproductive tract can be tested using molecular techniques such as polymerase chain reaction (PCR) [5]. PCR detects viral genetic material and can help confirm active infection. Serological tests such as ELISA detect antibodies against BoAHV-1 and are useful for studying exposure at the individual or herd level. Recent Indian research has also explored approaches that could make surveillance more practical. A 2025 study evaluated pooled sample testing for real-time PCR detection of BoAHV-1, highlighting the possibility of reducing the cost and workload associated with large-scale surveillance [6].

Can IBR Be Controlled?

Control of IBR requires more than treating animals after clinical signs appear. Vaccination, biosecurity, surveillance and appropriate herd management can all contribute to reducing the impact of infection.

Vaccination can reduce clinical disease and viral transmission, while biosecurity can reduce the introduction and spread of infection between herds. New animals introduced into a herd should be managed carefully. Breeding practices also require attention because the virus can be associated with reproductive secretions and semen. Laboratory surveillance is particularly useful because animals carrying latent infection may not show obvious clinical signs.

Future Prospects for India

Recent Indian research has expanded our understanding of IBR from simple detection of antibodies to molecular investigation of the viruses circulating in cattle and buffaloes. Interestingly, recent studies have also highlighted the presence of bubaline alphaherpesvirus-1 (BoHV-1) in Indian buffaloes. A 2025 study using differential serological testing found evidence of BoHV-1 infection among Indian buffaloes and demonstrated that both bovine and bubaline alphaherpesviruses may circulate in some mixed cattle-buffalo farming systems. This finding is important because routine tests may not always distinguish between closely related alphaherpesviruses. Better differentiation of these viruses could improve our understanding of their actual distribution and importance in Indian dairy animals.

Conclusion

IBR remains an important viral infection of Indian cattle and buffaloes. Its ability to cause respiratory and reproductive problems and persist as a latent infection makes early diagnosis, vaccination and proper herd management essential for reducing its impact.

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