Haemorrhagic Septicaemia: A Major Threat to Cattle and Buffalo

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Abstract

Haemorrhagic septicaemia (HS) is one of the most important bacterial diseases affecting cattle and buffaloes, particularly in tropical and subtropical regions of Asia and Africa. Disease is caused by *Pasteurella multocida*, and characterized by acute septicaemia, high fever, and respiratory distress, swelling of the throat and neck region, and high mortality. Buffaloes are generally more susceptible than cattle, and outbreaks are often associated with during high humidity, heavy rainfall, transportation stress, poor nutrition, and inadequate management practices. Transmission occurs primarily through direct contact with infected or carrier animals and contaminated feed or water sources. Early diagnosis and proper treatment are important and vaccination is the most effective way for disease prevention and control. Biosecurity at farm, proper nutrition, stress reduction, quarantine of newly introduced animals, and farmer awareness can help to reduce the occurrence of disease. Effective control of Haemorrhagic septicaemia requires coordinated efforts among farmers, veterinarians, researchers, and government agencies.

Keywords: Haemorrhagic Septicaemia, *Pasteurella multocida*, Cattle, Buffaloes, Vaccination

Introduction

Livestock plays a crucial role in the agricultural economy of many developing countries. In India and several developing countries, cattle and buffaloes are the backbone of rural livelihoods. They are source of milk, manure, draft power, and source of income to poor and marginal farmers. However, livestock production is constantly threatened by various infectious diseases that can reduce productivity and cause substantial economic losses. Among these diseases, Haemorrhagic septicaemia (HS) is considered as one of the most fatal bacterial infections of cattle and buffaloes. The disease is important due to

sudden onset, rapid progression, and sudden death of affected animal. Disease cause huge economic loss to countries due to significant mortality every year.

Etiological Agent

Haemorrhagic septicaemia is caused by a bacterium known as *Pasteurella multocida*. Bacteria is Gram-negative coccobacillus belongs to the family Pasteurellaceae appears as a small rod organism. It exhibits a characteristic bipolar staining pattern, and give safety-pin appearance on staining (Wilkie et al., 2012). The organism multiplying rapidly within the host once favourable conditions arise. The organism can persist in the upper respiratory tract of apparently healthy animals and such animals act as carriers and serve as a source of infection for susceptible livestock. Among several serotypes, specific serotypes are responsible for classical HS. In Asia, the disease is predominantly caused by serotype B:2. In Africa, serotype E:2 is most commonly associated with outbreaks (Bitew et al., 2025). Haemorrhagic septicaemia is widely distributed in tropical and subtropical regions and is commonly reported in India, Pakistan, Bangladesh, Nepal, Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia, the Philippines, and several African countries (Almoheer et al., 2022). High humidity, elevated temperatures, and seasonal rainfall favour the disease transmission and outbreaks.

Epidemiology

Although cattle and buffaloes are the primary hosts of haemorrhagic septicaemia, the disease has also been reported in several other domestic and wild animal species, including sheep, goats, camels, horses, donkeys, pigs, yaks, deer, and various wildlife species (Cuevas et al., 2020). Buffaloes generally exhibiting higher susceptibility and mortality rates than cattle (Chanda et al., 2024). The disease is characterized by a distinct seasonal pattern, with outbreaks occurring more frequently during the monsoon season, periods of heavy rainfall, high humidity, and sudden climatic changes. Unfavourable environmental conditions enhance the survival and transmission of the causative organism, thereby increasing the probability of outbreaks. Animals of all ages are susceptible to HS; however, young animals often exhibit greater susceptibility and may develop severe disease. Adult animals lacking prior exposure or protective immunity can witness high mortality rates during outbreaks.

Transmission

The transmission of HS involves a complex interaction between infected animals, carrier animals, environmental conditions, and susceptible hosts.

- **Carrier Animals:** These animals appear healthy but harbour bacteria in their respiratory tract, shed organisms intermittently.

- **Direct Contact:** Healthy animals become infected through close contact with infected or carrier animals.
- **Respiratory Secretions:** Nasal discharge and respiratory droplets contain large numbers of bacteria and transmit to susceptible animals infected with contaminated droplets.
- **Contaminated Feed and Water:** Feed and water contaminated by infected secretions can serve as sources of infection.
- **Environmental Survival:** Wet soil, bedding materials and contaminated water sources may contribute to disease spread.
- **Animal Movement:** Movement of infected animals from one location to another can introduce the disease into previously unaffected areas.

Clinical Forms

The disease may appear in different forms depending on; Animal species, Immunity level, and Environmental conditions

Three clinical forms are commonly recognized:

Per-acute: The per-acute form of haemorrhagic septicaemia is the most severe and very fatal to animals. Affected animals may die suddenly without exhibiting noticeable clinical signs.

Acute: The acute form is most frequently observed in the field. Affected animals exhibit High fever, depression, reduced feed intake, excessive salivation, nasal discharge, neck swelling, respiratory distress,

Subacute: The subacute form progresses more slowly, affected animals may survive longer and respond better to treatment.

Clinical Signs

Early recognition of haemorrhagic septicaemia is essential because treatment is most effective during the initial stages of infection. The disease typically begins with a sudden onset of high fever, with body temperature often rising above 40–41°C. Affected animals become dull, depressed, and lethargic, showing a marked reduction in appetite and water intake. Lactating animals often exhibit a sudden decline in milk production, and affected cattle or buffaloes become weak and reluctant to move.

One of the most important signs of haemorrhagic septicaemia is the development of a painful swelling in the throat, neck, and dewlap region (Fig 1). Respiratory discomfort and animals exhibiting rapid and laboured breathing, open-mouth respiration, and abnormal respiratory sounds due to airway obstruction and lung involvement. In advanced stages, affected animals

may become unable to stand, severe respiratory distress develops, frothy discharge and the mucous membranes become congested or cyanotic.

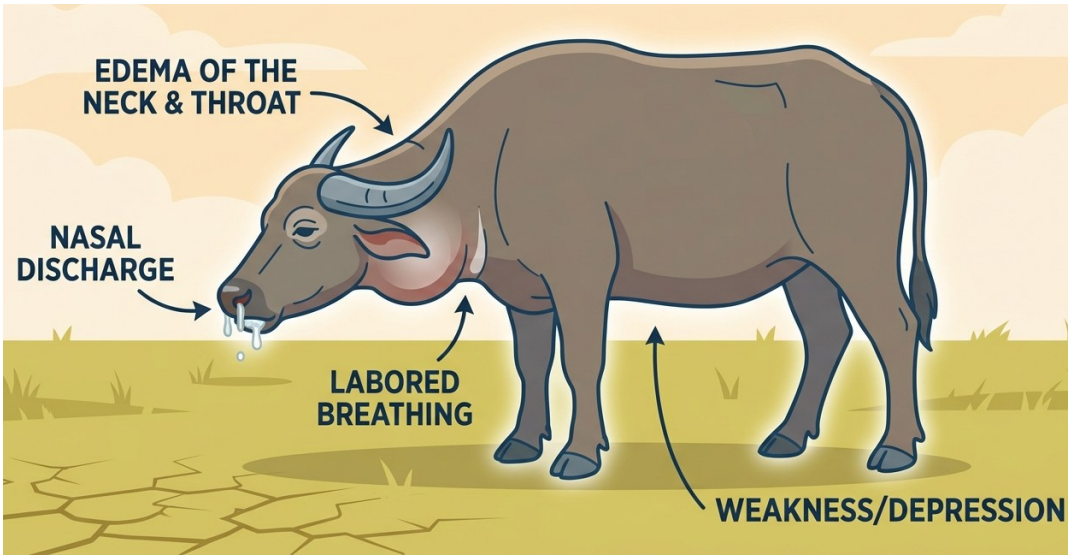

Fig. 1 Clinical symptoms of haemorrhagic septicaemia in buffalo (Image generated using Google Gemini AI)

Diagnosis

Accurate diagnosis is essential for effective disease control.

Clinical Diagnosis: Field diagnosis is based on history of sudden deaths, high fever, neck swelling, respiratory distress.

Laboratory Diagnosis: Definitive diagnosis of haemorrhagic septicaemia requires laboratory confirmation in addition to clinical observations and post-mortem findings. Common samples collected for laboratory examination include blood, nasal swabs, lymph node tissues, heart blood, and lung tissues from affected animals. Proper sample collection, handling, and transportation are essential to ensure accurate diagnostic results and successful isolation of the causative organism.

Economic Impact

Direct economic losses primarily arise from the death of valuable livestock. The loss of a high-producing dairy cow or buffalo leads not only the loss of a productive animal but significant financial investment. Milk yield may remain depressed for several weeks or months after recovery, further reducing farm income. Furthermore, farmers incur additional expenses related to veterinary consultations, diagnostic testing, medications, antibiotics, supportive treatment, and transportation of sick animal. The death of genetically superior breeding animals results in the permanent loss of valuable genetic resources. In addition, disease outbreaks may lead to restrictions on animal movement and trade, affecting livestock markets and income

generation. Governments and animal health agencies also incur substantial costs for disease surveillance, outbreak investigations, vaccination campaigns, and implementation of control measures.

Treatment

Because haemorrhagic septicaemia progresses very rapidly, immediate treatment is essential for survival. The success of treatment largely depends on early recognition of clinical signs, rapid diagnosis, and prompt veterinary intervention. Animals treated during the initial stages of infection generally have a much better prognosis than those treated after the disease has become advanced.

In addition to specific antimicrobial therapy prescribed by a veterinarian, supportive treatment plays a crucial role in improving recovery and reducing complications. Fluid therapy is often administered to combat dehydration, maintain blood circulation, and prevent shock. Anti-inflammatory and antihistamines drugs help reduce fever, inflammation, and discomfort, thereby improving the animal's overall condition. Electrolyte supplementation helps restore fluid and mineral balance, which is often disturbed during severe illness. Furthermore, adequate nutritional support is important to provide essential energy and nutrients needed for recovery, enhance immune function, and improve the animal's ability to withstand the infection.

Vaccination

Vaccination is the most effective and economical method for preventing hemorrhagic septicemia and should be administered before periods of increased disease risk (Dhakarwal et al., 2025). Since most outbreaks occur during the monsoon season, animals should ideally be vaccinated several weeks before the onset of the rainy season. Similarly, animals scheduled for transportation, marketing, or movement to new locations should be vaccinated in advance, as transportation-related stress can increase susceptibility to infection. Vaccination plays a critical role in establishing herd immunity within livestock populations.

Biosecurity and Prevention

Effective biosecurity is an important measure for haemorrhagic septicaemia (HS) prevention and plays a crucial role in reducing disease outbreaks and associated economic losses.

- An important biosecurity measure is the quarantine of newly purchased animals before their introduction into an existing herd. Newly acquired animals should be kept in isolation for a suitable period to allow observation for any signs of illness, implementation of necessary vaccinations, and prevention of the introduction of

infectious agents into the herd. Similarly, animals exhibiting clinical signs of HS should be immediately isolated from healthy animals.

- Regular cleaning of animal housing, proper drainage systems, routine disinfection of sheds and equipment, and the provision of clean drinking water help reduce environmental contamination and lower the risk of infection. Special attention should also be given to the proper disposal of carcasses.
- Balanced nutrition plays a vital role in enhancing the immune status of animals and improving their resistance to infectious diseases.
- Overcrowding, long-distance transportation, sudden dietary changes, and exposure to extreme weather conditions, can suppress immunity and predispose animals to infection. Therefore, minimizing these stress factors can significantly reduce the likelihood of disease occurrence.
- Strengthening veterinary infrastructure and ensuring timely access to veterinary care are essential for long-term disease prevention and control.
- Farmer awareness is perhaps one of the most effective tools for reducing disease losses.

Conclusion

Haemorrhagic septicaemia is a highly fatal bacterial disease of cattle and buffaloes that causes significant economic losses. However, it can be effectively controlled through timely vaccination, proper nutrition, biosecurity, and early veterinary intervention. Collaborative efforts among farmers, veterinarians, and policymakers are essential for sustainable disease prevention and livestock health.

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