



A Monthly e Magazine
ISSN:2583-2212

Sept, 2023; 3(09), 2276-2278

Popular Article

Lumpy skin disease: An emerging viral disease

Anupriya, Surendra Singh Shekhawat, Subhash Chand Meena, Vipin Chand Bairwa and
Neelam Meena

Department of Veterinary Public Health and Epidemiology
Post Graduate Institute of Veterinary Education and Research, Jaipur, Rajasthan 302031

<https://doi.org/10.5281/zenodo.8349280>

Abstract

The likelihood of the disease spreading to other parts of Asia and Europe is higher for lumpy skin disease, a developing bovine viral disease that is widespread in most African and some Middle Eastern nations. Understanding the restrictions and channels of distribution is crucial given the recent quick propagation of infectious diseases in nations that are currently disease-free. Capripoxvirus, the responsible agent, may result in goatpox and sheeppox. Given that they pose a threat to global trade and may be exploited as tools of financial bioterrorism, the economic impact of these illnesses is a major worry. Due to poor conditions in farming communities and limited availability to efficient immunizations, the dissemination of capripoxviruses appears to be spreading. This is mostly caused by the economic consequences of the Covid-19 pandemic, the enforcement of debilitating sanctions in endemic areas, a growth in the trading in livestock and animal products, both legally and illegally, as well as the effects of global climate change. The goal of the current review is to offer current knowledge on the different facets of the illness, including its clinicopathology, distribution, epidemiology, diagnostics, preventative and control strategies, and the probable contribution of wildlife to the disease's spread.

Introduction

Exanthema nodularis bovis, LSD, pseudo-urticaria, The Neethling virus illness, and knopvelsiekte are all names for the infectious condition lumpy skin disease. It is brought on by a virus (LSDV) from the genus Capripoxvirus in the family Poxviridae. Antigenically, it is very similar with the viruses that cause sheep and goat pox. However, standard serological tests cannot distinguish between these viruses. Cattle or water buffalo are affected by LSD. It is a transmitted via vectors disease spread by various biting and biting arthropods that feed on blood. Due to emaciation, harm to hides, infertility as mastitis, a decrease in milk supply, and death of up to 20%, LSD results in significant economic losses. The host cow breed and the capripoxvirus strain affect how severe the LSD clinical manifestations.

Etiology

The family Poxviridae member genus Capripoxvirus is the cause of Lumpy skin disorder. The sheep and goat poxviruses and the lumpy skin disease virus (LSDV) are closely linked antigenically.

2276



The LSDV genome (151 kbp) has 156 putative genes and a core coding region that is surrounded by similar 2.4 kbp-inverted terminal repeats. The chordopoxviruses from various genera, however, show 146 conserved genes, encoding proteins involved in virion structure and assembly, nucleotide metabolic processes, DNA replication, protein the process, transcription and mRNA synthesis, viral pathogenicity, and host spectrum. In particular, suipoxvirus, yatapoxvirus, and leporipoxvirus genes share a significant amount of colinearity and amino acid identity (an average of of 65%) with genes associated with other known mammalian poxviruses.

Transmission:

Mechanical transmission by vectors is the prime route of spread of disease. In most of the endemic countries like sub-Saharan Africa, Egypt and Ethiopia, the disease incidences significantly increase with the onset of seasonal rains and summer season, coinciding with the peak activity of the vectors.

Diagnosis

In case of LSD, clinical signs can be confused with other diseases like foot and mouth disease (FMD), insect bite, demodicosis and hypersensitivity. Tentative diagnosis can be made on the basis of skin nodules observed on face, eyelid, neck, muzzle, nostrils, udder, limbs. Skin biopsy sample can be collected for further confirmation of disease. Samples should be transported in transport medium with 20 to 50% glycerol in phosphate buffer saline. Skin samples can be checked by electron microscopy to identify virus. Samples of skin also show characteristic histopathological changes, which include vasculitis and perivascular infiltration with white cells causing a thrombosis of the vessel in the dermis and subcutis. Cells infiltrating the lesion are epithelial cells, known as “celles clavelaues”, which are also described in sheep pox. Molecular diagnosis with PCR is most efficient and rapid test for the diagnosis of disease.

The effects of LSD on cattle health

The LSD-infected ill cattle displayed some clinical symptoms that were visible to the naked eye and could have an impact on their health, such as edema of the skin mucosa, decreased milk production in cows, enlargement of the lymph nodes, nodular lesions of various sizes on the outermost layer of the skin, lameness of the legs, etc. According to studies, the majority of infected animals' organs and tissues exhibit pathological alterations such orchitis, cow mastitis, necrotic hepatitis, disseminated vasculitis, lymph nodes, etc. Tracheitis, cardiac damage, and other pathological alterations are present in a small proportion of cattle, which makes LSDV more dangerous to the body and causes varying degrees of harm inducing in the affected animals.

Differential diagnosis

There are many diseases causing similar signs of LSD. It is important to obtain a definite diagnosis to ensure the best preventative and control measures for susceptible herds.



LSD can be confused with the following diseases:

- Pseudo-lumpy-skin disease
- Bovine virus diarrhoea/mucosal disease
- Demodicosis (Demodex)
- Bovine malignant catarrhal fever (Snotsiekte)
- Rinderpest

Treatment

Lumpy skin disease is caused by virus and, therefore, has no known cure. However, antibiotics, anti-inflammatory drugs or a shot of vitamins are used in some cases to treat secondary bacterial infections or to deal with fever or inflammation and improvement of the animal's appetite.

Prevention and control

There is currently no effective LSD treatment available. Anti-inflammatory and antibacterial medications are used to treat symptoms. Effective preventative and control measures must be put in place in order to control the illness, including:

a) Restrict movement: To stop the spread of a transboundary disease, it should be strongly forbidden to move animals who have LSD infection. To stop the rapid propagation of disease inside a nation, animals having these lesions should be isolated for inspection.

b) Restrict vector movements: The migration of vectors brought on by the dominant winds may spread disease. The disease can also be prevented by employing vector control techniques like the use of mosquito traps and pesticides.

c) Vaccination: For LSD, a live attenuated vaccination is available. Businesses created vaccinations based on various LSD virus strains. It is either based on the SIS Neethling and type (Lumpyvax, MSD Animal Health-Intervet, South Africa) or the Neethling strain, such as the Lumpy Skin Disease Vaccine for Cows (Onderstepoort Biological Industries; OBP, South Africa) or Bovivax (MCI Sante Animale, Morocco). The sheeppox and goatpox vaccines can be used to treat LSD since the two viruses are closely related.

References

- Ali, A. A., Neamat-Allah, A. N. F., Sheire, H. A. E., and Mohamed, R. I. (2021). Prevalence, intensity, and impacts of non-cutaneous lesions of lumpy skin disease among some infected cattle flocks in Nile Delta governorates, Egypt. *Comp. Clin. Path.* 30, 693–700.
- Al-Salihi, K. (2014). Lumpy skin disease: Review of literature. *Mirror of research in veterinary sciences and animals*, 3(3), 6-23.
- Gupta, T., Patial, V., Bali, D., Angaria, S., Sharma, M., & Chahota, R. (2020). A review: Lumpy skin disease and its emergence in India. *Veterinary research communications*, 44, 111-118.
- Namazi F, Khodakaram Tafti A. Lumpy skin disease, an emerging transboundary viral disease: A review. *Vet Med Sci.* 2021 May;7(3):888-896. doi: 10.1002/vms3.434. Epub 2021 Feb 1. PMID: 33522708; PMCID: PMC8136940.

