



The Review on Lumpy Disease

Prathamesh R. Thakare¹, Rutuja S. Suryawanshi², Nikita R. Vhalgade³, Dhiraj S. Bhamare⁴, Asst. Prof. Ankita D. Sonar⁵

^{1,2,3,4,5}Swami Viveknand Sanstha's Institute of Pharmacy, Mungase, Malegaon

ABSTRACT

In our Review we will cover information about organisms that causes Lumpy Skin Disease and its epidemiology. We will also talk about the economic impact the disease has had in the past and could have the future. Additionally, we will talk about how it is transmitted the species, clinical and necropsy signs seen prevention and control measures for the disease as well as actions to take if Lumpy Skin Disease is suspect. This review contains brief introduction of Capripoxviruses. This review contains Introduction, Diagnosis, Treatment, Symptoms of lumpy disease. This review helps to provide important information for further research work on lumpy disease. In India, the epidemiological status of this disease is currently unknown. Vaccination and strict quarantine measures and vector control may be effective in preventing the spread of disease. The aim of this review is to summarize the latest developments in epidemiology, with a focus on transnational spread, etiology and transmission, clinical manifestations, disease diagnosis and treatment. This study reports the first appearance of LSD in Indian cattle and analyzes epidemiological and genetic characterization data for an outbreak of LSD in five districts of Orissa in August 2019. Of 102 samples from 60 suspected LSD and 17 asymptomatic contacts, 29.87% of the cows were positive by generic capripoxvirus PCR and 37.66% were positive by LSDV real-time PCR. All contact cattle tested were negative for LSDV. In affected cattle, the LSDV genome was detected more frequently in scabs (79.16%) than in blood (31.81%) and frozen bovine semen (20.45%). Differential diagnosis by PCR was negative for pseudo-LSD, chickenpox, cowpox, pseudocowpox, and bovine papular stomatitis. Five selected PCR- and real-time PCR-positive LSDV DNAs were sequenced in three genomic regions, P32 (LSDV074), F (LSDV117), and RPO30 (LSDV036).

INTRODUCTION

Lumpy Skin Disease

This is an acute to chronic viral disease characterized by bovine skin nodules it characterized by fever, cutaneous nodules and generalized lymphadenitis. Lumpy skin disease is caused by the virus family Poxviridae genus capripoxvirus. Serological tests Lumpy skin disease (LSD) has long been confined to sub-Saharan Africa. However, in recent decades has slowly invaded new territories, first spreading to the Middle East and Turkey, and since 2015 to most of the Balkans, Caucasus and the Russian Federation. control effort. The disease is having a dramatic impact on rural livelihoods that rely heavily on cattle, resulting in significant loss of income for affected farmers. The consequences are also devastating at the national level, as the emergence of the disease has caused severe trade restrictions: the risk of imminent transmission to neighboring countries is very high.

In the current situation, veterinary services in affected and vulnerable countries in the Middle East and Europe are facing the disease for the first time. Therefore, official veterinarians, ranchers, and others along the value chain are not familiar with the disease, transmission routes, and available prevention and control options. This guide aims to fill those gaps, primarily as it relates to the first line of defense. is grateful to the global scientific community for its contributions to LSD research, as well as to the World Organization for Animal Health (OIE), the European Commission and the Council – Health and Directorate General for Food Safety (DG SANTE), European Food Safety Agency (EFSA), European Hand, Foot and Mouth Disease Control Committee (EuFMD), International Atomic Energy Agency (IAEA) and National and International Reference Institutes. Finally, we would like to thank all the countries who have recently been affected, shared their experiences and supported us. describe the best practices available to control and eradicate LSD.



Economic Impact

Major economic importance

Production losses resulting from severe emaciation, lowered milk production, abortion, secondary mastitis loss of fertility, extensive damage to hides, and loss of draft from lameness .common on head, neck, bladder, perineum, legs, cores of necrotic material called "Sit-fasts". Secondary bacterial infection, Rhinitis conjunctives, lameness, Abortion and Fertility

Mortality In Number

As of 23 August 2022, a total of 35,000 cows have died from lumpy skin disease in nine states of India, according to the United Livestock Department. About 900,000 cattle have been infected while the department tries to stem the further spread of the disease.

In Maharashtra ,Times Of India Says that The State Animal Husbandary Department has registered over 8400 Cattle deth across the state with an increased mortality rate of over 6 per cent.

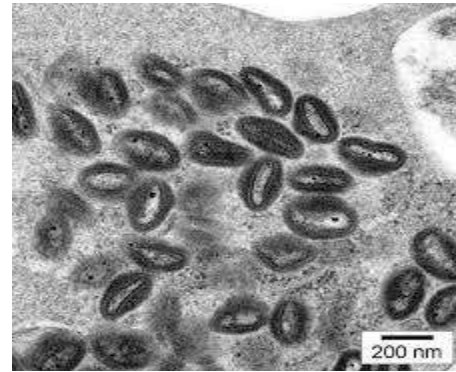
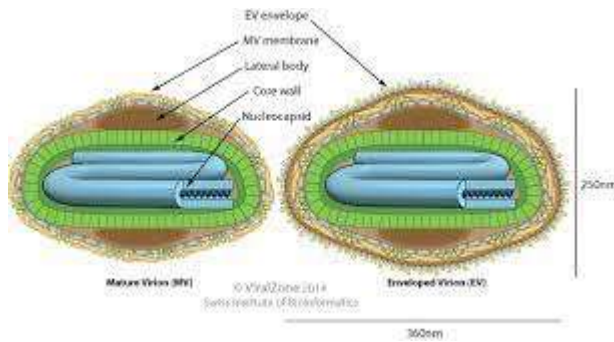
Symptoms

- Weight loss,
- High fever,
- Breathing difficulty,
- Lesions in mouth,
- Excessive nasal,
- salivary secretion.

Transmission

- Primary route:biting insects
- Minor route:direct contact
- Cutaneous lesions,saliva,nasal discharge,milk,semen,musles,Resistance to desiccation,No carier state

Capripoxviruses



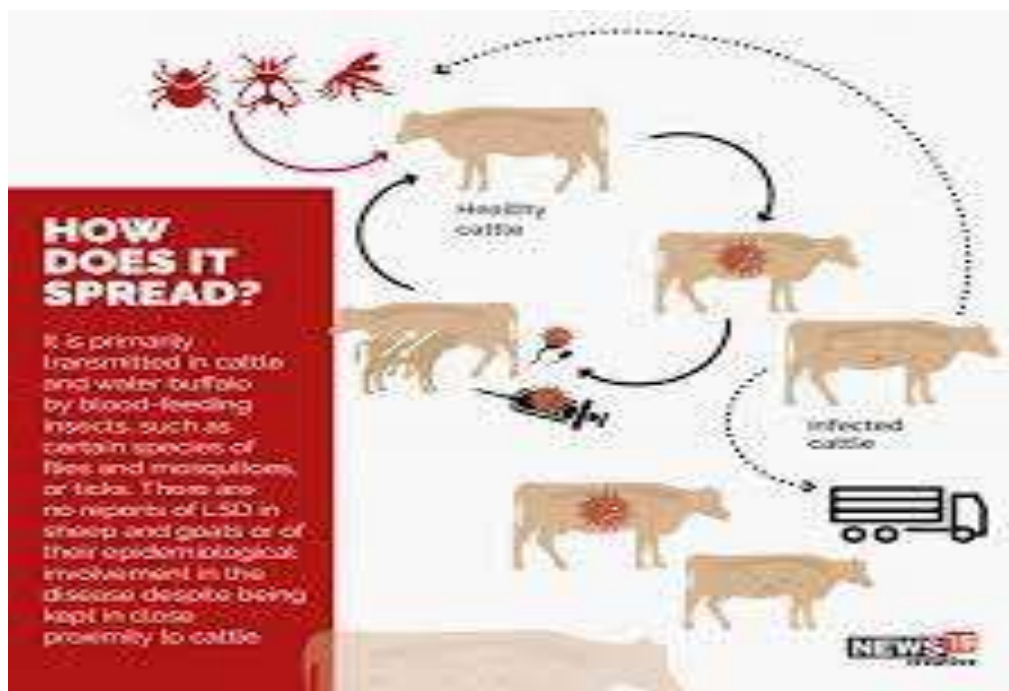
Introduction:

- **Family :** [Poxviridae](#).
- **Sub.Family:** [Chordopoxvirinae](#)
- **Structure:**Brick Shaped
- **Cpsid:**Envelopd
- **Genomic Arragement:**Linear
- **Genomic Segmentation:**Monopartite

Capripoxvirus is a genus of viruses in the subfamily Chordopoxvirinae and the family Poxviridae. Capripoxviruses are among the most serious of all animal poxviruses. All CaPV are notifiable diseases to the OIE (World Organisation for Animal Health). Sheep, goat, and cattle serve as natural hosts. These viruses cause negative economic consequences by damaging hides and wool and forcing the establishment of trade restrictions in response to an outbreak. The genus consists of three species: sheeppox virus (SPPV), goatpox virus (GTPV), and lumpy skin disease virus (LSDV).[3] They share no serological relationship with camel pox, horse pox, or avian poxes.[4] Capripoxviruses for sheeppox and goatpox infect only sheep and goat respectively. However, it is probable that North American relatives, the mountain goat and mountain sheep, may be susceptible to the strains but has not been experimentally proven. Lumpy skin disease virus affects primarily cattle, but studies have been shown that giraffes and impala are also susceptible to LSDV. Humans cannot be infected **with Capripoxvirus**.

Life Cycle

viral replication occurs in the cytoplasm. Entry into host cells is achieved by the binding of viral proteins to host glycosaminoglycans (GAGs) that mediate endocytosis of the virus into the host cell. Fusion with the plasma membrane to release the nucleus into the host cytoplasm. Early stage: Early genes are transcribed in the cytoplasm by viral RNA polymerase. Early expression begins 30 minutes after infection. After early expression ends, the nucleus is completely uncoated and the viral genome is released in the cytoplasm. Interphase: Intermediate genes are expressed and genomic DNA replication begins approximately 100 minutes after infection. Late: Late genes are expressed 140 minutes to 48 hours after infection and produce all structural proteins. Assembly of progeny virions begins in cytoplasmic viral factories, producing spherical immature particles. This virus particle matures into a brick-shaped intracellularly mature virion (IMV). IMV virions can acquire the second trans-Golgi and Bud bilayer membranes as host receptors for outer-enveloped virions (EEV) that are released upon cell lysis or mediate endocytosis. Replication follows a DNA strand displacement model. DNA-assisted transcription is a method of transcription. Viruses leave host cells by residing in occluded bodies after cell death and remain infective until they find another host. Sheep, goats, and cows are natural hosts.



Treatment

-Antibiotics for secondary infection up to 6 months

-Goat pox vaccine is very effective in this disease

-National Dairy Development board has supplied 28 Lakh dosage of goatpox vaccine in Gujrat

Prevention and control

- If you suspect a case of LSD , immediately notify authorities ,isolate the infected animals .
- Daily disinfect the shade of animals and quarantine the farm until definitive diagnosis is determine .
- Rapid vaccination campaign as per WOAHA (world organisation of animal health) .
- Herbal medicines is easily available and it is cost effective .

Conclusion

Lumpy skin disease is one of the most economically significant trans boundary, viral disease of domestic cattles and buffeloes. LSD is currently present in majority of African and middle eastern countries and it is newly reported in india, it becomes a serious threat to the entire bovine population in India.

The diseases economic impact was mostly due to its high morbidity rate rather than its mortality rate .

Better understanding and awareness for LSD are of utmost necessity to to tackle the production loss due to the disease in India .

Mortality In Number

As of 23 August 2022, a total of 35,000 cows have died from lumpy skin disease in nine states of India, according to the United Livestock Department. About 900,000 cattle have been infected while the department tries to stem the further spread of the disease.

In Maharashtra ,Times Of India Says that The State Animal Husbandary Department has registered over 8400 Cattle deth across the state with an increased mortality rate of over 6 per cent.

References

1. Ahmed n, doley s, barlaskar s .s, nath a .j, yadav s.n “a review study on lumpy skin disease an emerging bovine viral infection in india” Indian journal of animal health (2020) ,59(2):137-142.
2. <https://www.pashudhanpraharee.com/treatment-of-cattle-affected-with-lumpy-skin-disease-bsd-by-homeopathic-herbal-remedy/>

3. https://en.wikipedia.org/wiki/Lumpy_skin_disease_outbreak_in_India
4. <https://www.cfsph.iastate.edu/diseaseinfo/>
5. <https://pubmed.ncbi.nlm.nih.gov/1777792/#:~:text=Lumpy%20skin%20disease%20is%20an,whole%20of%20the%20animal's%20body.>
6. https://en.wikipedia.org/wiki/Lumpy_skin_disease
7. <https://www.slideshare.net/ZiadMohamed6/lumpy-skin-disease-ppt-file>
8. https://www.google.com/imgres?imgurl=https%3A%2F%2Fviralzone.expasy.org%2Fresources%2FPoxviridae_virion.jpg&imgrefurl=https%3A%2F%2Fviralzone.expasy.org%2F152&tbnid=Sop3LleadNgP5M&vet=12ahUKEwj8qPiokJT7AhXpidgFHellAxAQMygAegUIARC1AQ..i&docid=uSXW9ECT4CPOYM&w=592&h=323&q=Capripoxviruses&ved=2ahUKEwj8qPiokJT7AhXpidgFHellAxAQMygAegUIARC1AQ
9. https://www.google.com/imgres?imgurl=https%3A%2F%2Fmedia.springernature.com%2F1w685%2Fspringer-static%2Fimage%2Fchp%253A10.1007%252F978-3-319-92411-3_7%2FMediaObjects%2F417233_1_En_7_Fig1_HTML.jpg&imgrefurl=https%3A%2F%2Flink.springer.com%2Fchapter%2F10.1007%2F978-3-319-92411-3_7&tbnid=rMW17arDC22phM&vet=12ahUKEwj8qPiokJT7AhXpidgFHellAxAQMygCegUIARC5AQ..i&docid=333PP7S-Q77mQM&w=685&h=685&q=Capripoxviruses&ved=2ahUKEwj8qPiokJT7AhXpidgFHellAxAQMygCegUIARC5AQ
10. <https://www.youtube.com/watch?v=8ovXuonyzYQ>
11. <https://www.downtoearth.org.in/news/wildlife-biodiversity/lumpy-disease-35-000-cattle-killed-in-9-states-84540#:~:text=In%20India%2C%20the%20mortality%20rate,the%20infected%20cattle%2C%20Kumar%20said.>
12. <https://pubmed.ncbi.nlm.nih.gov/32857262/>
13. https://www.google.com/imgres?imgurl=https%3A%2F%2Fimages.news18.com%2Fbnlive%2Fuploads%2F2022%2F09%2F1umpy-skin-disease_4.jpg&imgrefurl=https%3A%2F%2Fwww.news18.com%2Fphotogallery%2Fphotogallery%2Fwhat-is-lumpy-skin-disease-that-affected-over-20-lakh-cattle-in-india-does-it-affect-humans-explained-in-gfx-6074953.html&tbnid=xLpGarKzcSpASM&vet=12ahUKEwjQhIvkqZb7AhUtjtGFHVrtDFwQMygIegUIARC7AQ..i&docid=dtB1ttN9mc1I1M&w=1500&h=1500&q=Capripoxvirus%20life%20cycle&ved=2ahUKEwjQhIvkqZb7AhUtjtGFHVrtDFwQMygIegUIARC7AQ