

## Popular Article

# Lumpy Skin Disease (LSD): Global Threat to Livestock and Farmers

Lokendra<sup>1\*</sup>, Manisha Doot<sup>1</sup>, Diwakar<sup>2</sup>, Surendra<sup>3</sup>, Sumit Karwa<sup>4</sup>

<sup>1\*</sup>M.V.Sc Scholar- Department of Veterinary and Animal Husbandry Extension Education at College of Veterinary Science & Animal Husbandry, Kamdhenu University, Junagadh

<sup>1</sup>PhD Scholar- Department of Veterinary Public Health and Epidemiology at College of Veterinary & Animal Science, RAJUVAS, Bikaner

<sup>2</sup>Assistant Professor- Department of Veterinary Microbiology, MJF CVAS, Chomu, Jaipur

<sup>3</sup>Assistant Professor- Department of Veterinary Public Health and Epidemiology at Arawali Veterinary College, Sikar

<sup>4</sup>M.V.Sc Scholar- Department of Animal Genetics and Breeding at Mumbai Veterinary College, MAFSU, Mumbai

<https://doi.org/10.5281/zenodo.6985458>

## Introduction

The manifestation of skin nodules is a defining feature of the vector-borne pox illness lumpy skin disease, which affects domestic cattle and Asian water buffalo. The disease is endemic to Africa and the Middle East, and it has now spread to the Balkans, the Caucasus, and southern Russian Federation. In 1929 in Zambia and in August 2019 in India, the first descriptions of LSD's clinical symptoms were made. LSD outbreaks result in significant economic losses for the afflicted nations, but poor, small-scale, and backyard farmers are the hardest hurt. This is true even if all industry participants in the cattle business experience financial losses. Production of cattle, milk outputs, and the physical health of animals are all severely impacted by the disease. Abortion, infertility, and damage to hides are all consequences. In LSD, morbidity rate is 10-15% and mortality rate is 1-5% (OIE, 2021). Incidence rate of LSD in Cattle is 30.8%, in Buffalo 1.6%, in Arabian Oryx 1.0%, in Giraffe 1.0%, in Impala 1.0%, in Yak 1.0% (El-Nahas *et al.*, 2011).

Transmission can also happen by direct contact, contaminated feed or water consumption, spontaneous mating, or artificial insemination in addition to vectors. The best method for controlling the disease's spread is widespread vaccination.

Animals from 1 to 5 years were the most afflicted (58.54%), followed by those older than 5 years (34.85%), and livestock younger than 1 year were the least impacted (6.61%) (Hatzade *et al.*, 2022).

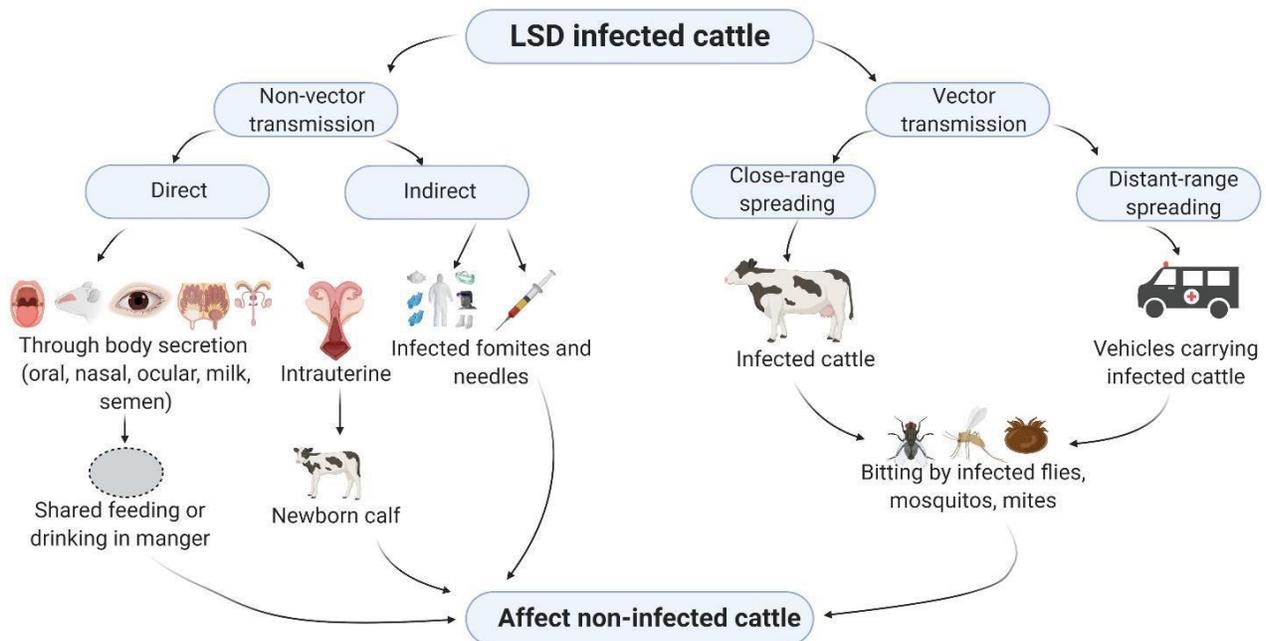


## Causative Agent

Lumpy skin disease is caused by the lumpy skin disease virus (LSDV), a member of the genus *Capripoxvirus* (CaPV) in the family *Poxviridae*. Lumpy skin disease virus is in the same genus as sheep pox virus (SPPV) and goat pox virus (GTPV), both of which are closely related but phylogenetically distinct.

## Transmission Of Lumpy Skin Disease

1. Vector transmission: Biting by infected flies, mosquitoes, mites.
2. Non-vector transmission: Infected fomites and needles, shared feeding or drinking in manger.



## Clinical Signs of Lumpy Skin Disease and Postmortem Findings

The incubation time varies between four and seven days in experimentally infected animals, although it can last up to five weeks in naturally infected animals.

Clinical signs include:

- Lachrymation and nasal discharge are typically the first symptoms seen.
- The prefemoral and subscapular lymph nodes expand and become easily palpable.
- A high fever (greater than 40.5 °C) may last for around a week.
- Rapid decline in milk production.

- Emaciation, anorexia, and depression.
- Skin lesions with nodules 10 to 50 mm in diameter (Fig.1).
- Mastitis and pneumonia brought on by the virus itself or subsequent bacterial infections are frequent side effects.
- Skin sores on the tops of the joints and in the legs may cause lameness and deep subcutaneous infections that are worsened by secondary bacterial infections (Fig.2).



#### **Postmortem findings include:**

- Pox lesions can be seen all over the digestive and respiratory systems, as well as on nearly any internal organ's surface.
- After the animal is skinned, subcutaneous lesions are easily discernible.
- Hemorrhages in the lungs, spleen, and rumen.
- Distinctive skin nodules.

#### **Differential Diagnosis**

Severe LSD symptoms are quite distinctive and simple to identify. Early infection stages and moderate instances, however, could be hard to tell apart. To distinguish between real instances, samples should be taken from all suspected animals and examined utilising quick and extremely sensitive PCR techniques. The following diseases may be considered as a differential diagnosis for LSD:

- Insect bites, urticaria, and photosensitisation: Dermal lesions that are caused by LSDV may resemble those from other diseases, however they are less severe and more superficial. The disease can be ruled out by detecting LSDV by PCR.
- Pseudocowpox (Parapoxvirus): Lesions occur only on the teats and udder. The disease can be ruled out by detecting LSDV by PCR.

- Dermatophilosis: Early ringworm lesions have a non-ulcerative, more superficial, and obviously distinct surface structure.
- Demodicosis: Alopecia is frequently seen, with the majority of the skin lesions being on the withers, neck, back, and flanks. Mites can be found using skin scrapings to rule out the condition.
- Bovine papular stomatitis (Parapoxvirus): Lesions occur only in the mucous membranes of the mouth. The disease can be ruled out by PCR testing.
- Besnoitiosis: Scleral conjunctival lesions are common, and dermal lesions can show alopecia with thick, wrinkly skin. LSDV detection by PCR can rule out the disease.
- Onchocerciasis: Dermal lesions are most prone to occur around the ventral midline. PCR can be used to rule out the disease.

## Treatment

There are no specific antiviral medications available, however supportive therapy for the afflicted animal can include treatment of skin lesions and antibiotics against subsequent skin infection and pneumonia.

Treatment with Enrofloxacin along with antihistaminic, NSAIDs and B-Complex for 3-10 days depending upon the severity of cases. Combination therapy of Dexamethasone for three days and broad-Spectrum antibiotics were effective in LSD virus infection (Feyisa, 2018). Ivermectin reduced the number of infectious virions in treatment of Lumpy skin disease (Yesilag *et al.*, 2021).

## Ethno-Veterinary Treatment of Lumpy Skin Disease

### First preparation

- Ingredients for one dose: Betel leaves (10 numbers), black pepper (10 grams), salt (10 grams), and any necessary amounts of jaggery.
- Preparation: Blend to a paste, then combines with jaggery.
- Administration: Orally, take one dose every three hours on the first day; starting on the second day, take three doses each day for three weeks.
- Caution: Each dose should be freshly prepared.

### Second preparation

- Ingredient for two doses: Two pearls of garlic, 10 grams each of cumin and coriander, and 1 handful of Tulsi, 10 grams Black pepper, two bulbs of shallots, five numbers of betel leaves, ten grams of bay leaves, 10 grams of turmeric powder, 30 grams of Chirata leaf powder, One handful of sweet basil, one handful each of Neem leaves, Aegle marmolos (BEL) leaves, and 100 grams of jaggery.



- Preparation - Blend to a paste, then combines with jaggery.
- Administration: Orally, start with one dose every three hours and increase to two doses per day (morning and evening) from day two until the problem is resolved.
- Caution: Each dose should be freshly prepared.

### **For external wound**

- Ingredients: One handful of *Acalypha Indica* leaves, 10 pearls of garlic, one handful of Neem leaves, 500 ml of coconut or sesame oil, 20 grams of turmeric powder, one handful of Mehendi leaves, and one handful of Tulsi leaves.
- Preparation: Blend each ingredient with 500 ml of coconut or sesame oil, then boil the mixture and let it cool.
- Administration: Clean the wound and apply directly.
- If maggots are seen: Apply Anona leaf paste or camphorated Coconut oil for the first day

### **Control And Prevention of Lumpy Skin Disease**

- Prophylactic vaccination of the entire cow population, performed well in advance in at-risk locations, provides the best protection.
- The movement of cattle within the nation and across international boundaries should be severely regulated or outright prohibited.
- If possible, without compromising animal welfare, cow herds in affected villages should be maintained apart from other herds by refraining from communal grazing.
- Movements of vaccinated animals may be permitted inside a limited zone within a country if it has been demonstrated that full immunity has been delivered by a vaccine with proven efficacy (28 days after vaccination).
- Cattle should be treated with insect repellents on a regular basis to reduce the risk of disease vector transmission. Although it cannot completely stop transmission, this step may lower the danger.
- Cleaning and sanitising of workers, facilities, and the surrounding area.
- Control of insects on animals and in the environment.

### **References**

El-Nahas, E.M., El-Habbaa, A.S., El-Bagoury, G.F. and Radwan, M.E.I. (2011). Isolation and identification of lumpy skin disease virus from naturally infected buffaloes at Kaluobia, Egypt. *Global Veterinaria*, 7: 234-237.



- FAO, 2017. LUMPY SKIN DISEASE: A field manual for veterinarians. Edited by Tuppurainen, E., Alexandrov, T., Alcrudo, D. FAO Animal production and Health Manual No. 20. Rome.
- Feyisa AF (2018). A case report on clinical management of lumpy skin disease in bull. *Journal of Veterinary science and technology*.2 2018; 9: 538.
- Hatzade, R.I., Bhikane, A.U., Waghmare, S.P. and Pajai, K.S., 2022. Clinical, haemato-biochemical alterations and therapeutic regimens in lumpy skin disease (LSD) affected cattle in Maharashtra State, India. *Research Square*; 2022
- NDDDB (National Dairy Development Board, India). Ethno veterinary Formulation for Lumpy skin disease. 2020 Available at: [https://www.dairyknowledge.in/sites/default/files/pdfs/Lumpy\\_Skin\\_Disease\\_Poster\\_English.pdf](https://www.dairyknowledge.in/sites/default/files/pdfs/Lumpy_Skin_Disease_Poster_English.pdf) (Accessed on 15 December 2020).
- Yesilag, K., Toker, E. B. and Ates, O. (2021). Ivermectin also inhibits the replication of bovine respiratory viruses (BRSV, BPIV-3, BoHV-1, BCoV and BVDV) in vitro. *Virus research*, 297, p.1983-84.

