



REVIEW ARTICLE

LUMPY VIRUS OUTBREAKS IN INDIA

Sunita Chaudhary, Krina Patel

Arihant School of Pharmacy and BRI, Adalaj, Gandhinagar, India.

ABSTRACT

Animal husbandry is a vital sector of the Indian economy. The emergence of new illnesses, which is a big worry for livestock owners, is currently one of the primary obstacles facing the livestock and dairy sectors. The transboundary illness lumpy skin disease (LSD), which affects cattle and water buffaloes, is significant economically. A virus known as the lumpy skin disease virus (LSDV) causes lumpy skin disease (LSD). This virus belongs to the Capripoxvirus genus of the Poxviridae family. Recently, there has been a 7.1% morbidity rate among cattle in India due to LSD. Clinical signs of this illness usually involve fever, loss of appetite, and unique nodules on the skin's mucous membranes found in the mouth, nose, udder, genital, and rectum. They also include a decrease in milk supply, abortion, infertility, and occasionally death. It may be possible to stop the spread of the illness by vaccination, stringent quarantine rules, and vector control.

Keywords: Lumpy skin disease, Viral infection, Transboundary spread, Outbreak, India.

INTRODUCTION

As India is still thriving from the impact of COVID-19, there it comes another virus “Lumpy Skin Disease” (LSD) that makes an appearance in India. Also known as Neethling virus [1].

Lumpy Skin disease which has been considered an endemic situation that is emerged in 1929 Africa has been gulping the states of Gujarat and Rajasthan [1]. This disease has spread to around 17 states in the country. Which is a devastating threat to large domestic ruminants [2].

Lumpy skin disease is caused by a virus known as Capripoxvirus (CaPV), which belongs to the Poxviridae family and is closely related to the viruses that cause goat and sheep pox [3]. The viruses that cause sheep pox (SPPV) and goat pox (GTPV) belong to the same genus as the virus responsible for lumpy skin disease [4]. This is “an emerging threat to livestock worldwide” and has an impact on domestic water buffalo (*Bubalus bubalis*) and dairy cattle

(*Bos taurus*) [3] [4]. Ticks or other insects that feed on blood, including some types of flies and mosquitoes, or other insects that bite for food, can spread it [5]. Additionally, the illness can be transferred between animals directly in some circumstances as well as through fomites (items or materials that are prone to transmit the infection, such as clothing, utensils, and furniture) [6]. Since LSDV is not zoonotic, it cannot be transmitted from animals to people. This virus has no effect on humans [6].

In India, which has the most cow population in the world (303 million), the illness has spread to 15 states in just 16 months in 2019 [6]. Odisha announced the first LSD epidemic in August 2019, and five districts were dealing with the exotic cow disease [6].

A certain viral strain was found in Maharashtra in September 2020 [7]. Gujarat has sometimes reported instances throughout the past few years as well, but in the current circumstances, the spread of the virus and the number of recorded deaths are the main causes for concern [7]. Disease may lead to problems with animal welfare and considerable output losses, which also have a huge negative impact on India's economy and animal welfare [7].

In May 2022, the first instance was observed in the Kutch hamlet of Kaiyari in Lakhpat Taluka [8]. Kutch and Jamnagar are two of the Gujarat state's hardest-hit areas; the effects are less severe in the other districts [8]. 15 out of Gujarat's 33

districts have been affected by the 2022 LSD outbreak [8]. According to official statistics (Animal Husbandry Department), over 40,222 cattle have been infected, and 1,021 animals have died in the past few weeks in the state of Gujarat. Reportedly 294,000 have been vaccinated [8].

A total of 2,111 cow fatalities have been reported as of August 8 in Rajasthan, followed by 1,679 in Gujarat, 672 in Punjab, 38 in Himachal Pradesh, 29 in Andaman & Nicobar, and 26 in Uttarakhand [9].

Jodhpur, Barmer, Jaisalmer, Jalore, Pali, Sirohi, Bikaner, Churu, Ganganagar, Hanumangarh, Ajmer, Nagaur, Bhilwara, Tonk, Jaipur, Sikar, Jhunjhunu, Alwar, Dausa, Chittorgarh, Bharatpur, Dholpur, Karauli, Banswara, Rajsamand, Pratapgarh, Dungarpur and Udaipur have all reported cases [9].

The disease has caused the greatest impact in Ganganagar (Rajasthan), resulting in 3,672 deaths. Jodhpur follows with 2,426 deaths, then Hanumangarh with 2,167, Nagaur with 2,099, Barmer with 1,973, Jalore with 1,765, and finally Bikaner with 1,704. Out of the 512,140 animals infected, more than 461,643 have received treatment [9].

Circular, hard nodes that resemble lumps on the animal's hide (skin) are a sign of infection [10]. A nodular skin lesion can range in size from 10 to 50 mm [10]. The number of lesions varies and may be minimal in situations of moderate infection

before progressively increasing in severity in seriously affected animals [10].

Nearly a week after viral infection, fever starts to develop. This first fever might reach 41 °C (106 °F) or higher and last for a week [10].

When animals with skin lesions, mucous membranes in the mouth and nasal cavities, as well as ocular discharge, excrete infectious virus, which may contaminate shared feeding and drinking water locations, virus transmission takes place [11]. Which further cause transmission of virus to another bovine, thus in this way a chain is generated which eventually leads to an epidemic [11].

Greater vulnerability exists in thin-skinned cattle than in native breeds with thicker skin [12]. While newborn calves are at a higher risk and can display the characteristic lesion within 24 to 48 hours, all animals of different ages are prone to contracting the disease [12]. According to reports, the virus may linger in desiccated (dry) crusts for up to 35 days, in necrotic skin nodules that are considered to be “dead” or “corpse” for up to 33 days, and in air-dried hides for at least 18 days [12].

It is believed that skin lesions are the main infection sites in cattle [13]. Certain arthropods, particularly blood-sucking insects such as mosquitoes and ticks, as well as the *Stomoxys calcitrans* fly, the *Aedes aegypti* mosquito, and certain tick species like *Rhipicephalus* and *Amblyomma* spp., can transmit the LSDV

virus. The disease can be spread through infected food and water, as well as bodily fluids like saliva, nasal secretions, and semen during the later stages of the illness [13].

The virus can infect females during natural mating or artificial insemination because it persists in the semen of infected bulls [10]. The corneas of both eyes may occasionally develop severe ulcerative lesions as well, which in the worst instances might result in blindness [10].

Virus can also be transmitted to calves those drinks infected bovine milk [11]. Disease symptoms include fever, lack of appetite, salivation, Symptoms such as nasal discharge, lacrimation, swollen lymph nodes, a notable decrease in milk production, and weight loss are commonly observed in cases of LSD [11]. It is common for pregnant cows and buffaloes to experience miscarriage. Unfortunately, in certain situations, diseased animals may also perish as a result [14].

The state’s first lumpy care centre has been established by the Jaipur Greater Municipal Corporation at the city’s Hingonia Gaushala [12].

Infected animals are recovered within three weeks when treated with anti-allergy and antibiotic medicines [15].

The best way of prevention is to keep the diseased animal in isolation [16]. No other animal should be allowed to approach the ill especially their baby calves or consume its remaining water or feed [16].

There is no proper treatment so far for LSDV, but several traditional medicines are used for the treatment and various anti-allergy, antibiotics medicines are very helpful [16].

At present, there is no known cure for lumpy skin disease. Thus, treatment mainly focuses on managing the clinical symptoms [17]. The vaccine currently being administered is the same one used for the goatpox virus [17]. According to reports, two institutes under the Indian Council of Agricultural Research have successfully created a domestic vaccine for the illness [17].

A vaccine called Lumpi-ProVacInd has been created through a collaboration between the National Equine Research Centre in Hisar, Haryana and the Indian Veterinary Research Institute in Izzatnagar, Bareilly, both institutes under the Indian Council of Agricultural Research (ICAR) [12]. Which the Union government is planning to commercialise [12].

CONCLUSION

More than 60% of India's rural population depends on the livestock industry for a living and nutritional sustenance. The livestock industry is crucial to the Indian economy. The recent epidemic of Lumpy skin disease (LSD), which requires considerable attention to reframe our vision to see livestock health and production holistically, is one of the issues this living asset is currently confronting. Instances of lumpy skin disease (LSD) are

not typical virus outbreaks. The disease's recent expansion, which began in June 2022 and moved into disease-free areas, is evidence of its importance in terms of epidemiology and the economy. The illness causes death, decreased draught power, decreased milk output, infertility, abortions, culling, and losses in hide quality, according to the cattle owners. It also causes weight loss and infertility. An estimated financial loss of Rs. 35,000 to 80,000 (approximately) each dead animal recorded during the present epidemic is a significant loss for a farmer whose livelihood depends on the production of livestock. The morbidity rate is typically up to 50% and the death rate is typically around 1-5%.

LSD outbreak management techniques should be thoroughly implemented. These include raising awareness of LSD, limiting animal movement, isolating affected animals, keeping an eye on stray animals, cleaning and disinfecting the area, controlling insects, and ultimately, safely disposing of carcasses. Preventive vaccination should be carried out in mission mode in high-risk locations, such as the borders of afflicted states and districts, and infected animals should be identified and documented.

REFERENCES

- [1] "Several Indian states grapple with lumpy skin disease," *The express tribune*, 2022.

- [2] M. Das, S. Akter and . A. K. Mondal, "An updated review on lumpy skin disease: perspective of," *Journal of advance biotechnology and experimental therapeuticd*, pp. 322-333, 2021.
- [3] N. F. and K. Tafti, "Lumpy skin disease, an emerging transboundary viral disease: A review," *Vet Med Sci.*, 2021 May.
- [4] I. N. Desk, "What Is Lumpy Skin Disease Which Killed Over 3,000 Cattle In Rajasthan, Gujarat," Friday August August 5, 2022.
- [5] W. t. f. encyclopedia, "Lumpy skin disease," 2022.
- [6] S. K. A. S. A. Panda and A. Chakravartty, "Lumpy skin disease: The deadly pandemic that has taken root among India's bovines," *Down To Earth*, 2021.
- [7] A. Perinchery, " What Is Lumpy Skin Disease and Why Is it Raising Concerns?," 2022.
- [8] R. Mani and M. J. Beillard, "Outbreak of Lumpy Skin Disease in Cattle Raises Alarm in Cattle-rearing Communities in the State of Gujarat," Global Agricultural Information Network, New Delhi, 2022.
- [9] A. Gehlot, Interviewee, *Rajasthan CM demands Centre to declare lumpy skin disease in cows a 'pandemic'*. [Interview]. Friday August 2022.
- [10] D. L. J. KAKATI, "Vikaspedia," [Online].
- [11] S. A. P. Y. W. D. T. E. and K. A. , "Transmission of lumpy skin disease virus: A short review," 2019.
- [12] D. A. U. H. WANI, "Lumpy Skin Disease: A threat to India's dairy industry," Friday August 2022.
- [13] L. M. . K. L. and . E. S. , "Bacterial Skin Infections in Livestock and Plant-Based Alternatives to Their Antibiotic Treatment," August 2021.
- [14] R. Singh, "What is Lumpy Skin Disease, the viral infection killing cattle in Gujarat, Rajasthan," The Indian Express, New Delhi, August 12, 2022.
- [15] "World Organisation For Animal Health," July 2022. [Online].
- [16] P. Gibbs, "Lumpy Skin Disease in Cattle," *MSD Manual Veterinary manual*, 2021.
- [17] E. S. T. . C. R. P. K. B.-B. N. J. K. and . S. A. , "Characterization of sheep pox virus vaccine for cattle against lumpy skin disease virus," *National Library Of Medicine*, 2014.
- [18] E. Mulatu and A. Feyisa, "Review: Lumpy Skin Disease," *Journal of Veterinary Science and Technology* , 2018.
- [19] D. L. Goldenberg, "Septic arthritis," *The Lancet Journal*, vol. 351, pp. 197-202, 1998.