

Lumpy Skin Disease Emerging Problem in Pakistan

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Abstract

Lumpy skin disease is important disease of livestock sector posing a big problem to livestock sector and economy. Lumpy skin disease (LSD) is an emerging transboundary vector-borne viral infection that affects cattle and domestic bathing buffaloes caused by LSD virus (LSDV). The virus belongs to the Capripoxvirus genus of the family Poxviridae, which also contains sheep pox virus and goat pox virus. LSD is enzootic in several African countries. Since 2012, the disease has spread rapidly and widely throughout the eastern Europe regions, southern Caucasus and parts of the Russian Federation as well as parts of Asia. The OIE lists it as one of the bovine notifiable illnesses. It is one of the most serious health issues confronting the global cattle business. In addition to the international trade embargo and animal movement restrictions, the disease causes major economic losses owing to skin damage, reduced meat and milk production, infertility, mastitis, and mortality. Lumpy skin disease spread more rapidly in Province Sindh and some parts of province Punjab. Since March 2022, verifiable epidemiological data has revealed a 33% morbidity rate and a 0.6% mortality rate in Pakistan. Mortality and infection rate of lumpy skin disease become double during Eid al Adha. The first LSD outbreak was detected in southern Pakistan in November 2021 and notified by the government on March 4th, 2022. Since 2019, LSD has been detected in India, China, and Iran, all of which share Pakistan's border possibly indicating a transboundary transmission channel from Iran and India, both of which border southern Pakistan. LSD is unquestionably posing a danger to dent Pakistan's livestock sector and business.

Keywords: Pakistan; Asia; Lumpy skin disease; Outbreak; Lumpy skin disease virus

Introduction

Lumpy skin disease (LSD) is a re-emerging transboundary infectious disease of cattles, domestic outdoor bathwater buffaloes, sheep and goat [1]. Fever and outer nodular lesions on skin, digestive tracts and respiratory tracts mucous membranes are the major symptoms of lumpy skin disease. It is caused by the lumpy skin disease virus (LSDV), often known as the Neethling virus. The World Organization for Animal Health (OIE) has classified it as a notifiable viral illness in cattle. Reduced milk and meat production, miscarriages, infertility, and damaged hides are all significant economic losses caused by this devastating transboundary illness [2]. LSD is not transmitted to humans and offers no direct or indirect harm to public health when cattle are contacted or when meat and milk are consumed [3].

LSDV is a member of the Capripoxvirus genus in the Poxviridae family. It shares genetic similarities with other two Capripoxvirus species; Goatpox virus (GTPV) and Sheeppox virus (SPPV). LSDV has a double-stranded DNA genome that is approximately 151,000 bp in length and encodes 156 proteins. The average size of capripoxvirions is 320 nm by 260 nm [4]. Blood feeding arthropod such as flies, mosquitos, and ticks are the most common vectors of LSDV transmission [5].

Insect control, Quarantines, depopulation, cleansing and disinfection of infectious farms/herds are useful ways to reduce disease burden, but vaccination is the most effective prevention and control strategy. The GTPV&SPPV vaccination is effective against the LSD virus due to antigenic similarities.

Geographically, LSD was first found in Africa in 1929 and has remained enzootic in various African countries. Since 2012, the disease has spread fast and widely throughout eastern Europe, the southern Caucasus, and sections of the Russian Federation. LSD has spread to a number of countries in Asia, since 2019. Recently, LSD has been detected in India, China, and Iran, all of which share Pakistan's border

possibly indicating a transboundary transmission channel from Iran and India, both of which border southern Pakistan.

The outbreak started in October 2021. In November 2021, Sindh livestock department started investigating an unknown skin disease in cattle which was spreading rapidly in different parts of Sindh province with significant mortality. Cows in Sindh and a few areas of Punjab provinces are still infected with LSD.

Methods and Materials

Surveillance data reported by national and provincial livestock departments from March to July, 2022 were extracted and analyzed descriptively.

Results and Discussion

In Pakistan, over 100,000 animals (mostly cattle) were affected with lumpy skin disease until now. This study represented data of only one province Sindh of Pakistan before July, 2022. This outbreak of lumpy skin A total of (n=25266) cases were detected and reported in mid-March with district wise number of cases and deaths (n=182) but cases were not classified (as severe and no severe). Overall, mortality rate was <1% (0.7%). Mortality rate (5.17%) is highest in district Khairpur Sindh, Pakistan (**Table 1**). District Karachi had highest cases of lumpy

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Table 1: Lumpy Skin Disease Data province Sindh till March 2022.

S.No.	District	No. of Reports till last day	Cases reported today	Total till today	Animal Recovered	Animal under recovery	Mortality at the day
1	Karachi	15899	171	16070	1943	14107	20
2	Thatta	4360	28	4388	4188	154	46
3	Hyderabad	477	10	487	441	34	12
4	Sujawal	167	7	174	144	21	9
5	TM Khan	776	6	782	668	109	5
6	Badin	799	12	811	742	64	5
7	Umerkot	35	3	38	19	19	0
8	Mirpurkhas	20	3	23	20	3	0
9	Sanghar	0	1	1	0	1	0
10	Matlari	119	11	130	50	77	3
11	S. Benazir Abad	196	23	219	123	3	3
12	N. Feroz	12	2	14	9	5	0
13	Khairpur	522	13	535	315	193	27
14	Sukkur	16	0	16	13	3	0
15	Kamber S. Kot	396	35	431	339	82	10
16	Dadu	130	9	139	18	120	1
17	Jamshoro	310	27	337	247	80	10
18	Thana Bula Kham	595	39	634	490	125	19
19	Choodiko	47	157	204	47	153	4
20	Kach @ Juhi	31	0	31	8	23	0
Total		25266	575	25811	9590	16069	182=0.7%

Table 2: Lumpy Skin Disease Data province Punjab till July 2022.

S. No.	Punjab Province	Total Cattles	No. of Reports till last day	Total Today	Total till Today	Animals recovered	Animal under recovery	Mortality at the day
1	Southern Punjab	7176350	8843	2	8845	7529	2	24
2	Northern Punjab	7459096	1983	2	1885	1449	2	31
		14635546	10,826	4	10,830	8,978	4	55=0.5%

skin disease (16000) with mortality rate 0.125%. In Province Haripur, KPK, there is mortality rate of 67% in 300 cattles and some buffaloes (Dawn News 1 July 2022). It seemed that buffalo animals had high immunity against lumpy skin disease as compared to cattle animals. The overall prevalence rate in Pakistan is around 1%. Southern Punjab provinces are highly affected with mortality rate of 0.5 % after Eid Al Adha. There are around 1623890 cattles and buffaloes were vaccinated in Punjab (Livestock Department Punjab). In Southern and Northern Punjab, 10,826 cattles were affected with lumpy skin diseases with mortality rate of 0.5% (Table 2). Bahawalpur and Multan were most affected districts of Southern Punjab. The prevalence of Lumpy skin disease was higher in Southern Punjab 0.06% as compared Northern Punjab (0.01%). The mortality rate and infertility were high in southern and northern Punjab (0.5 %). The mortality rate was higher in northern Punjab as compared to southern Punjab (Table 2).

Pakistan was free from Lumpy skin disease before January, 2022. Then, there was a sudden outbreak of lumpy skin disease in various districts of province Sindh. After, Eid Ad Adha, there was a sudden transport of slaughtering animals from Sindh to Punjab which was a major cause of outbreak in southern Punjab. There was least check and balance during Eid holidays. Central and western Punjab had limited case and had controlled almost all cases with full strength facilities. The vaccination was increased to decrease the extent of disease spread. Ivermectin 0.2mg/Kg was giving best result for the treatment of LSD as discussion with treating Veterinary experts. Cross Breed Cattles have less resistance to lumpy skin disease as compared to indigenous cattles due less resistance against lumpy skin disease [6]. Unrestricted livestock animals' movement from one province to another province

and thousands of wet markets during EID AD ADHA were major factors contributing rapid spread of lumpy skin diseases in Muslim countries [7]. The sudden out break started in China and India in August 2019 [8,9] and cattles movement were the outbreak factor in these countries [10]. LSDV transmission within the farm is further related to biosecurity measures and other management practices. We found a positive association between communal water supply as well as brick pavement as observed by others [11]. There was a common ectoparasite which was responsible of spread of LSDV in all recent studies [12].

Conclusion

Lumpy skin disease is an emerging problem for Pakistan. There is dire need to stop the transport of animals from one province to another province to stop the spread of LSD. Pakistan is majorly relied on livestock sector to uplift economy. All provinces cattles should be vaccinated to get rid of this lethal economy affecting disease.

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Conflicts of interest/Competing interests (include appropriate disclosures)

Authors declare that manuscript has not any conflict of interest.

Ethical Statement/Approval

This is a data-based article; no ethical letter is required.

Data Availability

The data is available from Department of Livestock in Punjab and Sindh provinces.

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