

Prevalence Of Lumpy Skin Disease In Cattle At Kachua Area Of Bagerhat, Bangladesh

Md. Aktarul Islam¹, S.M Harun-Ur-Rashid², Md. Gausur Rahman³,
Md. Golam Azam^{1*}

Department of Pathology and Parasitology, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200.

Abstract:

Lumpy skin disease (LSD) is an acute viral disease of cattle with major economic impacts and recently emerged very common in Bangladesh. This cross-sectional study was designed to evaluate the prevalence, temporal distribution, and risk factors of clinical LSD. The present study was performed in the Upazila Livestock Office and Veterinary Hospital, Kachua, Bagerhat during the period of January 2020 to December 2020. A total of 690 cattle were examined where 94 cattle were found to be infected with Lumpy Skin Disease virus based on the clinical inspection, clinical history and owners complain. The results indicated that the overall prevalence of LSD was 13.62% in cattle. The incidence rate of the disease was discussed based on the effect of age, sex, breed and season. According to age, the prevalence of LSD was higher in 1.5-3 years (17.73), followed by >3 year (15.47%), 0-6 months (13.18%) and 6 months - 1.5 years (10.41%) respectively. The prevalence of LSD in male and female was 13.87% and 13.44%. Cross breed cattle (15.22%) had higher prevalence than indigenous cattle (11.65%). The temporal patterns indicate a higher number of LSD cases in May (46.66%) and June (48.61%). Moreover, the season of summer (29.46%) were significant ($p < 0.05$) higher for LSD. There was no statistically significant ($p > 0.05$) difference between the two sexes, breed and different ages. So, it is concluded that season and month were found to be associated with the potential risk of LSD occurrence.

Key words: *Lumpy skin disease (LSD), Prevalence, Risk factor, temporal distribution.*

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I. Introduction

Lumpy skin disease (LSD) caused by the lumpy skin disease virus (LSDV) is a vector-borne disease of cattle and Asian water buffalo. LSD virus is classified in the genus Capripoxvirus within the subfamily Chordopoxvirinae of the family Poxviridae [3]. Transmission is predominantly via arthropod vectors including hard ticks, biting flies and/or mosquitoes. Direct transmission is also possible through saliva, semen, milk, or contact directly with lesions of infected cattle; however the direct course is less efficient in the absence of insect vectors [4]. Morbidity and mortality of the disease vary considerably depending on the breed of cattle, the immunological status of the population and insect vectors involved in the transmission. Also, lactating cows of either breed are severely affected by LSD [14]. While mortality rates in cattle are often low, the relatively high morbidity of LSD once introduced into naive populations can lead to significant income losses for farmers brought about by decreased milk production, damaged hides and emaciation of animals, infertility and abortions [13]. Lumpy Skin Disease (LSD) has been portrayed as a terrifying threat to cattle in Southeast Asia. A lump like nodules on the external skin and mucous membrane with fever and swollen lymph nodes are the preliminary noticeable clinical signs of this devastating disease [17]. The recent LSD introductions in Asia are of concern as India, China and Bangladesh have some of the world's largest bovine populations. There have been few risk assessments or risk models addressing introduction or spread of LSD in the past, these mainly targeting countries in Africa, Europe and Central Asia [5, 11, 17]. LSD is more prevalent during the wet summer and autumn months and occurs particularly in low-lying areas and along water- courses [4, 13]. The spread of lumpy skin disease in recent years beyond its ancestral home in Bangladesh is alarming. Quarantine restrictions have proved to be of limited use. Vaccination with attenuated virus offers the most promising method of control and was effective in halting the spread of the disease in Bangladesh. Administration of antibiotics to control secondary infection and good nursing care are recommended, but the large number of affected animals within a herd may preclude treatment. However, more information is required to describe the occurrence pattern of LSD for the measure of appropriate veterinary care and sustainable disease control program and animal production. Considering the above facts, these research works have been conducted with following objectives: 1) To determine the prevalence of lumpy skin disease in cattle. 2) To study the epidemiological factors affecting prevalence of LSD.

II. Materials and Methods

Experimental area

The study was conducted at upazila livestock office and veterinary hospital, Kachua, Bagerhat and surrounding village of this upazila.

Experimental animals

The total population of the clinical cases was 690 among which 94 cases were registered in this upazila livestock office and hospital Kachua, Bagerhat during the course of experimental period.

Experimental duration

The duration of the experiment was one year and conducted from January/2020 to December/2020

Epidemiological study

The annual incidences of Lumpy Skin Disease emphasizing on different epidemiological parameters such as age, sex, breed and season were determined. The seasonal concurrences of the disease were also considered.

Clinical examination

The presented clinical manifestations of Lumpy Skin Disease were recorded during the physical visits, following submission in the hospital and the farmer's complaints in relation to the affection were also emphasized.

Pathological examination

The gross morbid lesions of the diseases were systematically examined, noted and categorized. The suitable sizes of skin of the affected animal were collected from the animals subjected for the diagnosis for further histopathological study.

Determination of Prevalence:

Prevalence is a statistical concept referring to the number of cases of a disease that are present in a particular population at a given time which is determined by following equation,

$$\text{Prevalence} = \frac{\text{Total no of animals suffered at a given period of time}}{\text{No of animals suffered due to disease of your interest at same period of time}} \times 100$$

Statistical analysis

All collected data were analyzed by SPSS version 22 using Chi-square test.

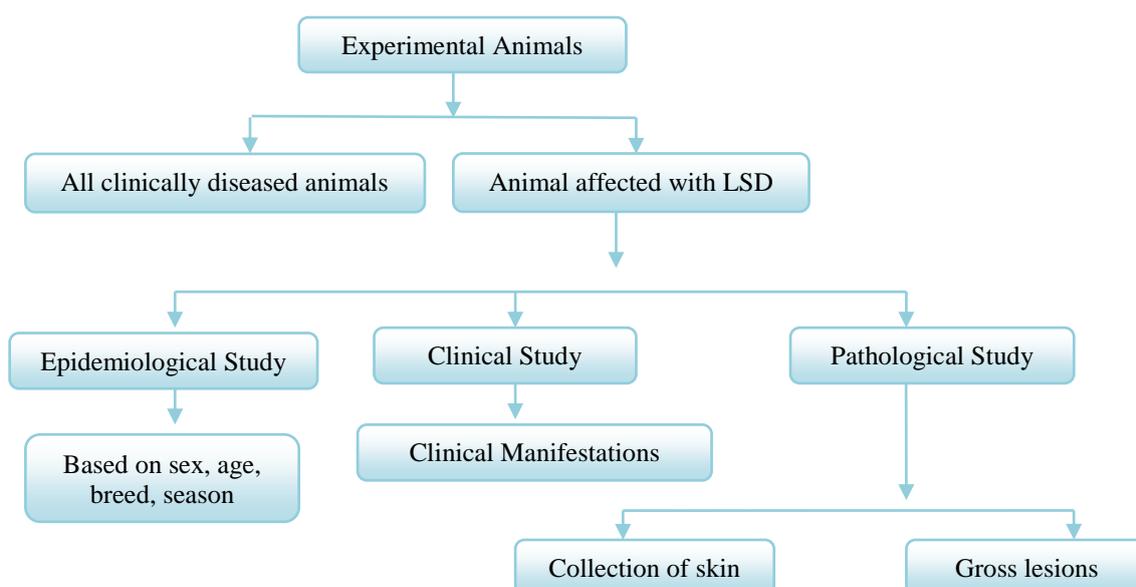


Figure 1. Experimental Layout

III. Results

Prevalence of LSD in cattle

The study was conducted at Kachua Upazilla of Bagerhat District from January to December, 2020. Total 690 animals were examined where 94 animals were clinically positive for Lumpy Skin Disease (LSD). The overall prevalence was 13.62%. The prevalence rate of LSD among the different age, sex, breeds and season were calculated which are presented below tabular form.

Table-1: Prevalence of LSD at different month of the year 2020.

Month of the year (2020)	Number of Cattle Examined	Number of Infected Animal (LSD)	Percentage (%)	P value
January	77	5	6.49	.001
February	85	8	9.41	
March	73	4	5.47	
April	34	6	17.64	
May	45	21	46.66	
June	72	35	48.61	
July	41	10	24.39	
August	42	3	7.14	
September	48	1	2.08	
October	53	1	1.88	
November	66	0	0	
December	58	0	0	
Total =	690	94	13.62	

S= significant (P<0.05)

- Lumpy Skin Disease (LSD) was higher in May-June month than other months.

Age wise prevalence of LSD in cattle

The present study reported that, there is no significance relationship in prevalence of LSD for different age group but it was observed that higher prevalence in adult than calf and young animal.

Table 2: Age wise prevalence of LSD

Age group of Animals	Number of Cattle Examined	Number of infected Animal	Percentage (%)	P value
Calf (0-6 Months)	273	36	13.18	0.263
Young (6 months-1.5 Year)	192	20	10.41	
Adult (1.5 Year - 3Year)	141	25	17.73	
(>3Year)	84	13	15.47	
Total =	690	94	13.62	

N S= Non significant (P>0.05)

Sex wise prevalence of LSD

From this study we observed that, there is no significance or insignificance effect of sex in prevalence of LSD. Prevalence rate was slightly higher in male than female which is not considerable.

Table 3: Sex wise prevalence of LSD in cattle

Sex Group	Number of Cattle Examined	Number of Infected Animal	Percentage (%)	P value
Male	281	39	13.87	.155
Female	409	55	13.44	
Total =	690	94	13.62	

N S= Non significant (P>0.05)

Breed wise prevalence of LSD

In present study, the prevalence rate was higher in cross breed cattle than indigenous cattle but there is no significance relationship in between breed and occurrence of LSD.

Table 4. Breed wise prevalence of lumpy skin disease in cattle

Breed	No. of Cattle Examined	No. of Infected Animal	Percentage (%)	P value
Cross breed	381	58	15.22	.174
Indigenous breed	309	36	11.65	
Total =	690	94	13.62	

N S= Non significant (P>0.05)

Season wise prevalence of LSD

It was observed that, seasonal variation has significant effect on occurrence and distribution of LSD and higher prevalence was recorded in summer season than rainy season and winter season.

Table 5: Season wise prevalence of lumpy skin disease in cattle

Season of the year	No. of Cattle Examined	No. of infected Animal	Percentage (%)	P value
Summer Season (March-June)	224	66	29.46	.001
Rainy Season (July-October)	184	15	8.15	
Winter Season (July-October)	282	13	4.54	
Total =	690	94	13.62	

S= significant (P<0.05)

Photographic presentation of LSD



Figure 2. Clinical manifestation of LSD

IV. Discussion

This study revealed that the overall prevalence of LSD was 13.62% in Kachua Upazilla, Bagerhat of Bangladesh. But other authors reported the dissimilar prevalence of LSD in our country and abroad. In Bangladesh, Sarkar *et al.* [18] found 41.06% in Dinajpur, Haque & Gofur [8] reported 49% in Naogon, Khalil *et al.* [10] recorded 21% in Barishal. In abroad, Elhaig *et al.* [7] reported 17.4% in Egypt, Ochwo *et al.* [13] found 8.7% in Uganda and Molla *et al.* [12] observed 26.5% in Ethiopia. In fact, the prevalence of LSD may differ from region to region, country to country even area to area within a country. This variation in the prevalence of LSD in cattle may be due to agro ecological conditions which affect availability of vectors, animal husbandry practices, lack of treatment practice, wrong method of vaccination, prevalence of infected vectors, selection of samples, techniques of samples collection etc. In considering the age of animals, the prevalence was higher in adult when compared to young and calf. There was no statistically significant difference between animal age group on prevalence of LSD (Table 2). The results have similarities with the findings of Haque & Gofur [8] and Elmohsen *et al.* [14]. Earlier, Elhaig *et al.* [7] and Molla *et al.* [12] reported statistically no significant variation on age group and prevalence. Sarkar *et al.* [18] and Abera *et al.* [1] reported the LSD prevalence was higher in young cattle in comparison with adult. This dissimilar report to this study was probably due to variation in study place and time. The low prevalence in calves in this study may be associated with lower susceptibility of calves to biting flies and keeping them where there is less insect activity [16, 19]. Another possibility may be the

presence of passive maternal immunity which protects calves for about 6 months [19]. Though this study suggested that, there was no significant ($p>0.05$) influence of sex on LSD prevalence despite of slightly higher prevalence of LSD infection in male (13.87%) than female (13.44%). Badhy *et al.* [3] and Elmohsen *et al.* [14] reported that, the prevalence of LSD was moderately higher in male than female. But Ochwo *et al.* [13] reported that, the sex of cattle had significant effect on LSD in Uganda. Interestingly, this study was in line with the findings of Sarkar *et al.* [18], Elhaig *et al.* [7] and Molla *et al.* [12] who found no significant association of sex on LSD occurrences. The exact causes of this variation is unknown but it may be due to the alteration in the physiological condition of the animals during pregnancy and lactation (Production activity) and also the lack of feed supplement for production, which may lead to the lowering of body resistance of the females. It was observed that, breed of cattle have no significant effect on the prevalence of LSD. The higher rate of prevalence (15.22) was recorded in cross breed cattle than in indigenous cattle (11.65). It is suggested that cross breed cattle were mostly prone to any infection including viral infection. The indigenous breeds of cattle are in lower risk to diseases [9]. In this study, the prevalence was significantly higher proportion in May-June month which was also observed by Badhy *et al.* [3] and Elmohsen *et al.* [14]. The outbreak of LSD mostly occurs in summer and autumn season (Table 5) due to moist warm condition which is favorable for breeding of flies. This might be due to the greater action and breeding season of vectors engaged with the transmission of the infection [6]. This variation might be due to different climatic factors such as temperature, rainfall, humidity etc, which influenced the availability of intermediate host, other agro-climatic condition, ecology of the vector & host and geographical location of the experimental area.

IV. Conclusion

In conclusion, the results of this study alluded that the outbreak of Lumpy Skin Disease (LSD) hve no significant association with the sex, breed, and age of cattle. The outbreak of LSD was significantly higher in summer season than rainy and winter season. So, it can be concluded that season and month were found to be associated with the potential risk of LSD occurrence but age, sex and breed of cattle having no important effect on prevalence of LSD. The result of this experiment is providing the basic epidemiological data about LSD in research area of Bangladesh which will be helpful for proper preventive measures and control strategy of this malady. The data generated in this study would be beneficial to the field veterinarians and animal health decision makers as well as it will aid in taking appropriate measures to prevent further relapse of this disease in future. Further, detail epidemiological study along with biochemical, histopathological and molecular study is strongly recommended for proper diagnosis, appropriate prevention and control strategy of Lumpy Skin Disease (LSD) in Bangladesh.

V. References

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