

**A report on Diagnosis & clinical management of LSD affected  
Cattle at Upozila Veterinary Hospital, Raozan, Chattogram,  
Bangladesh.**



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A report submitted in partial satisfaction of therequirements for the

degree of

***Doctor of Veterinary Medicine***

**Faculty of Veterinary Medicine**

**Chattogram Veterinary and Animal Sciences University**

**Khulshi, Chattogram-4225**

**August , 2020.**

**A report on Diagnosis & clinical management of LSD affected  
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**August , 2020.**

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## Abstract

Lumpy skin disease(LSD) is an infectious , eruptive, occasionally fatal disease of cattle with significant economic importance in middle East & Africa. In 2019,LSD outbreak also occurred in Bangladesh as first time.This report aimed to diagnosis & clinical management of a 1.5 years age of LSD affected cattle,came to the Upozila Veterinary Hospital,Raozan,Chattogram. Physical examination revealed nodules in different parts of the body with high body temperature (41°C). Besides, there was swelling of both prescapular and prefemoral lymph nodes and lameness. Based on the history, clinical findings and Biochemical & Hematological results the case was confirmed as lumpy skin disease. The case was managed vigorously with symptomatic & supportive treatment and after about four weeks the bull was recovered.

**Keywords:** Lympy skin disease, Treatment Outcome, Hematology, Biochemistry.

## Chapter I: Introduction

Lumpy skin disease is an acute infectious disease of cattle which is characterized by high fever, lymphadenopathy, sudden eruption of multiple circumscribed skin nodules, necrotic plaques in mucosa & subsequent sit fasts of the nodules. It is caused by lumpy skin disease virus (LSDV) for which Neethling strain is the prototype and transmitted mechanically by arthropod vectors (Tuppurainen ES et al. 2012; Coetzer JA et al. 2013; Lubinga JC et al. 2014)

In severe cases continuous high pyrexia (40-41.5°C), depression and anorexia may ensue (Constable PD et al. 2017). Subsequently, milk production lessens, abortion, temporary or permanent sterility, damage to hide and deaths will occur which further contribute to a momentous economic loss (OIE, 2010; Tuppurainen ES et al. 2017). Vaccination is one of the preventive measures for LSDV. But, as it is not available in Bangladesh, the treatment of LSD is only symptomatic and targeted at preventing secondary bacterial complications using combination of antimicrobial and anti-inflammatory drugs (Salib FA, Osman AH 2011; Abutarbush SM et al. 2013)

The virus has no record of zoonotic infection to humans. (OIE 2017). It was first confirmed in Zambia in 1929 and now considered as enzootic throughout Africa and the Middle East. In 2015 the first outbreak of LSD recorded in Europe through Greece and rapidly covered South-Eastern Europe. The outbreak of LSD occurs in summer and autumn season due to moist, warm conditions which is favorable for breeding of flies and usually ceases in the winter (P. Calistri et al. 2020). A study in Ethiopia stated the introduction of new animals to the herd and the presence of water bodies act as risk factors. Although, this virus could infect all breeds of cattle irrespective of age and sex, but *Bos Taurus* are found more susceptible than *Bos indicus* (A.A. Farah Gumbe et al. 2018)

Bangladesh first outbreak was known to start in Karnaphuli Upazila (sub-district) of Chattogram division on 22nd 87 July, 2019 although confirmed as Lumpy skin disease through real time PCR on 27th 88 August, 2019. The initial attack rate was 18% with no mortality (DLS, Situation Report, 2019). Within a short time, the disease has surged to all parts of the country. According to the situation report published by the department of livestock services total cases reached to 553,528 among the 25 million cattle population

and recorded total death of 97 since 3<sup>rd</sup> December, 2019 (DLS, Situation Report,2019)  
The present report describes a case of LSD affected cattle and its confirmation & management procedure for recovery .

## **Chapter II: Materials & Methods**

October 16,2019, an age of 1.5 years old local breed cattle was came to the Upozila Veterinary Hospital, Raozan,Chattogram with the clinical signs of nodules on different parts of the body. After physical examination, revealed high rectal temperature (41°C), the respiration rate & heart rate was, respectively 35 breaths/min & 62 beats/min. Owner complained, less grazing & reduced feed intake by the cattle. There was swelling of both prescapular & prefemoral lymph nodes & lameness. Initially, it was assumed as Lymphoedema, based on the clinical history & clinical signs.

### **Sample collection –**

For further confirmation, blood was collected(with & without EDTA) from the jugular vein of affected cattle to blood vacutainer tube stored in thermoflask with ice. After that it was immediately send to the Physiology Lab of Chattogram Veterinary & Animal Sciences University (CVASU), under the Department of Physiology, Biochemistry & Pharmacology for hematological and biochemical test.

### **Methods-**

An Biochemistry Analyzer (Humalyzer 2000), was used to evaluate the biochemical profile (Total Protein,Glucose,Albumin,Globulin etc.) by the serum sample.The serum was separated from the blood by centrifugation at 2000r.p.m for 15minutes in a centrifuge machine.

The hematological profile (RBCs,Hb,PCV etc.) of the cattle was determined by an automated cell counter (Cell Tech Alpha,Japan) by the supplied blood sample which was mixed with anticoagulant (10% EDTA).

## Chapter III: Results

### 1.Hematological findings:

In Table.1 Hematological findings are shown of the infected cattle. It exhibited significant increases in certain blood parameters(RBCs,Hb & PCV) ,significant decreases in MCV,Platelets,WBCs etc. and no significant changes in MCHC.

### 2. Biochemical findings:

In Table.2, the biochemical findings are recorded in which it shows that serum levels of total protein,Globulin,Creatinine,AST,ALP,ALT were significantly elevated and Albumin & Glucose levels were significantly decreased from the normal values.

Table.1-Hematological results of the collected sample.

Parameters	Normal Values	Results
RBC ( $10^6/\mu\text{L}$ )	4.9-7.2	7.4
Hb (gm/dL)	8.4-12.2	13
PCV %	24-46	48
MCV fl	38-50	36.5
MCHC (gm/dL)	36-39	36
Platelets ( $10^3/\mu\text{L}$ )	233-690	150
TLC ( $10^3/\mu\text{L}$ )	5.8-12.6	4.5
Neutrophil ( $10^3/\mu\text{L}$ )	2.3-6.8	2.1
Eosinophil ( $10^3/\mu\text{L}$ )	0-1.2	0
Lymphocyte ( $10^3/\mu\text{L}$ )	1.7-5.6	1.5
Monocyte ( $10^3/\mu\text{L}$ )	0-0.9	0.06



Table.2-Biochemical results of the collected sample.

Parameters	Normal Values	Results
Total Protein (gm/dL)	6.9-8.6	9.2
Albumin (gm/dL)	2.4-3.5	1.9
Globulin ( gm/dL)	3.5-4.5	4.8
AST (U/L)	19.21-84.97	116.3
ALP (U/L)	29-111	118.2
ALT (U/L)	5.24-29.68	32.9
Glucose (mg/dL)	53-76	49.7
Creatinine (mg/dL)	0.5-0.9	1.1
Direct Bilirubin (mg/dL)	0-1.4	1.51

## Chapter IV: Discussion

Lumpy skin disease is considered a transboundary animal disease due to its significant impacts on trade and food security as well as its capacity to spread to other countries (Rossiter and Al Hammadi 2009). However, LSD has been eradicated at a high cost by rapidly diagnosing cattle, slaughtering all diseased or in-contact cattle and small ruminants, and vaccinating the remaining cattle (Davies 1991). LSDV was diagnosed in this study based on the biochemical findings, hematological findings and clinical signs.

In this study, the infected cattle had increased erythrocyte counts, which may have been related to dehydration or absolute erythrocytosis. Infected cattle typically exhibit dehydration exacerbated by fever, anorexia, and lethargy, which are common manifestations of LSDV infections. In addition, chronic diseases in large animals can be associated with absolute erythrocytosis (Morris 2002). LSDV-infected cattle produced leucopenia with eosinopenia, lymphopenia and monocytopenia, which may result from viral infections (Coles 1986); a release of high quantities of corticosteroid hormones also induces lymphopenia (Ismail and Yousseff 2006). The results agree with those of Neamat-Allah (2015). Thrombocytopenia occurred in the infected cattle and was mainly attributed to the shortening of the platelet life span. This phenomenon is typically caused by excessive platelet consumption due to systemic vasculitides, which were widespread in our study due to the tropism of LSDV to endothelial cells (House et al. 1990; Radostitis et al. 2000).

With respect to biochemical results, total protein and globulin levels were elevated in LSDV infected cattle; however, dehydration may elevate the total protein level, also albumin levels were reduced, likely due to increased protein catabolism or decreased protein synthesis as well as hepatic damage (Hassan et al. 2011). Globulin elevation is correlated with the body's immune response against infection (Agag et al. 1992). LSDV infection significantly increased serum AST & ALT activity, a phenomenon that reflects hepatocyte damage, even if such damage is subclinical (Kauppinen 1984; Meyer and Harvey 1998). In addition, AST is present in cardiac and skeletal muscle cells; therefore, AST elevation in this study may have been related to injury or inflammation of cardiac muscle due to the presence of LSDV in the heart (Stockham and Scott 2008; Zilva et al. 1988). Serum ALP was elevated in infected cattle, this phenomenon may have been caused by the effects of inflammation on cells lining and surrounding the biliary

ducts;related to the presence of hepatic cholestasis (Abutarbush 2015; Stockham and Scott 2008), which was confirmed by elevated direct bilirubin; or attributable to renal or intestinal infections (Coles 1986). Therefore, elevated AST and ALP in LSDV-infected cattle could be related to viremia-induced hepatic injury (Sevik et al. 2016).Infected cattle exhibited reduced glucose levels, which may indicate decreased food intake and increased glucose catabolism in the body during viral infection. Moreover, creatinine concentration was significantly increased in LSDV-infected cattle,which may be attributed to the damaging effects of LSDV on the kidneys (Coles 1986) and decreased blood flow to the kidneys during the viremic stage of LSD to decrease the virus's toxic effects.

## **Conclusion**

The present study clearly established that LSDV-infected cattle exhibited alterations in hematological & biochemical findings; thus, rapid detection and diagnosis of LSD and good treatment are recommended to prevent high losses. Lumpy skin disease (LSD) is an economically devastating viral disease of cattle characterized by distinctive nodular lesions principally on the skin, hence reduces hide quality. A treatment aimed at preventing LSD complications and saving the life has been successful using a combination of antimicrobials and anti-inflammatory.

## **Limitations**

PCR is the best technique for rapidly detecting and identifying the causative agent of the examined viral outbreak. PCR exhibited high sensitivity for detecting LSD virus DNA in skin nodular samples, a finding consistent with the results obtained by Tuppurainen et al.

(2005) and Sharawi and Abd El-Rahim (2011).

But, it's a great sorrow that we couldn't perform the PCR method for the diagnosis of the virus due to lack of availability.

## Case Management and Treatment Outcome

A combination therapy of *Inj. Combicillin LA* at the dose of 20000-40000 I.U/kg Body. weight for five consecutive days and *Inj. Astavet* at the dose of 1mg/kg Body. weight for five successive days, Intramuscularly were prescribed to the cattle. Also advised to bath the cattle with the *Solution. Virocid* at the dose of 12ml/liter of water for ten days.

About, four weeks later, the affected cattle recovered successfully & the condition was improved, reported by the owner.



Figure 1: The affected bull first day at UVH.



Figure 2: Swollen prefemoral Lymph Node



Figure 3: Administration of drug to the



Figure 4: Recovered bull,4weeks later.bull.

## Acknowledgements

At first I am really thankful to Almighty who has given me strength and opportunity to complete the report.

Completion of any work or responsibility gives nice feelings but the accomplishment of this work as the partial fulfillment of the requirements for the degree of Doctor of Veterinary Medicine (DVM) in Chattogram Veterinary and Animal Sciences University (CVASU), not only has given me the pleasure but also given me the confidence to move ahead and showed me a new opening to knowledge. I feel proud in expressing his deep sense of gratitude and indebtedness to **Professor, Dr. Md. Abdul Ahad, Dean, Faculty of Veterinary Medicine, (CVASU)** for his kindness & guidance .

I wish to express gratitude to **Professor Dr. A.K.M Saifuddin, Director of External Affairs, CVASU** for his supervision and for placing this type of report as a compulsory part of internship program.

I would like to extend my gratitude to my supervisor, **Professor Dr. Mohammad Mejbah Uddin, Department of Anatomy & Histology, Faculty of Veterinary Medicine, CVASU**. My heartfelt thanks to him for his support and creative directions. Special thanks to Upazila Livestock Officer (ULO), Veterinary Surgeon (VS) and other staffs of Upazila Veterinary Hospital, Raozan, Chattogram for their cordial cooperation at the time of conducting the report.

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## **BIOGRAPHY:**

**Mohammad Rasel**, son of Md.Mohon Mia, was born 6th January, 1994 in Cumilla, Bangladesh. He had completed his Secondary School Certificate (SSC) examination at 2011 with GPA-5 from Nasirabad Govt.High School, Chattogram and Higher Secondary Certificate (HSC) examination at 2013 with GPA 5.00 from Govt. City College, Chattogram. He enrolled for Doctor of Veterinary Medicine (DVM) degree in Chattogram Veterinary and Animal Sciences University (CVASU), Chattogram, Bangladesh in 2014-2015 session. Currently he have been doing his internship programme which is the compulsory of DVM programme under the Faculty of Veterinary Medicine,CVASU. In the near future, he would like to work and have massive interest in farm animal medicine.