

MOLECULAR DIAGNOSIS OF LUMPY SKIN DISEASE IN A CROSSBRED COW – FIRST CONFIRMED REPORT FROM KERALA

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ABSTRACT

This paper reports clinical management of lumpy skin disease in a cow that was presented with nodular eruptions on skin to University Teaching Veterinary Clinical Complex, Mannuthy. A thorough physical examination revealed that the cow had fever and small to large sized circumscribed nodules distributed throughout the body. Swelling of both prescapular and prefemoral lymph nodes was noticed. Based on the history, clinical findings and PCR result the case was confirmed as lumpy skin disease (LSD). The case was managed vigorously with combination therapy and interestingly the cow recovered. This is the first confirmed report of LSD from Kerala.

Keywords: Lumpy Skin Disease, Cow, Treatment, Kerala

INTRODUCTION

Lumpy Skin Disease (LSD) is a vector borne viral disease of cattle and

Asian water buffalo, characterized by fever and skin nodules. When introduced into naive population, the disease can cause substantial economic losses, both direct and indirect, the estimated direct production loss being 40 to 60 per cent. Etiological agent belongs to the genus Capripox virus in the Poxviridae family (Tuppurainen and Oura, 2012) and transmitted mechanically by arthropod vectors (Lubinga *et al.*, 2014). The disease epizootics were associated with high rain fall and high levels of insect activity, which peaked in late summer and autumn (Gari *et al.*, 2010). Lumpy skin disease could be classified into mild and severe forms based on number of lumps (nodules) and occurrence of complications that included, involvement of mucous membranes of respiratory, urogenital systems and other internal organs (Tageldin *et al.*, 2014). In severe cases, high fever (40-41.5°C) which persisted for one week, depression, anorexia, excessive salivation, enlargement of subscapular and pre-femoral

lymph nodes, decreased milk production, abortion, temporary or permanent sterility, damage to hides and mortality were noticed (Tuppurainen *et al.*, 2017). The recovery of animals from infection was very slow due to secondary bacterial infection and deep holes appeared in the skin due to fly strike (Al-Salihi, 2014). Tulman *et al.* (2001) reported LSD virus as a very stable virus, which survived well in the environment and inside the scabs shed by infected animals. Diagnosis of LSD is based on characteristic skin lesions and confirmation by laboratory tests. Whole blood, serum, oral and nasal swabs, skin nodules, scabs and lymph node biopsy are collected and sent to laboratory for confirmation of the disease. According to Abutarbush *et al.* (2015), only symptomatic treatment of LSD was possible, using combination of antimicrobial and anti-inflammatory drugs, to prevent secondary bacterial complications.

The disease was first reported in Zambia of African continent in 1929 and later on spread to whole African continent except Libya, Algeria, Morocco and Tunisia (Tuppurainen and Oura, 2012).

According to OIE, the first report of LSD from India was on 12/08/2019 from Khairbani, Mayurbhanj district of Orissa, then from Pataliputra on 17/08/2019 and from Rajendrapur of Bhadrak district on

20/08/2019 and the disease was confirmed on 16/11/2019. Based on phylogenetic analysis, the strain present in India was genetically close to South African NI2490/KSGP-like strains rather than European strains (Sudhakar *et al.*, 2020).

CASE HISTORY AND OBSERVATIONS

On 22nd November, 2019 a crossbred cow aged four and half years from Vaniyampara, in Thrissur district of Kerala was presented to the TVCC, Mannuthy with the history of anorexia, reduction in milk yield and eruptions on skin (Fig.1). On clinical examination, temperature was 104.2°F, hyper salivation, lacrimation, nasal discharge, oedema of hind limb, difficulty in walking and prominent skin nodules over head, neck, perineum, genitalia and limbs were noticed. Scabs were seen fallen off from few nodules, unveiling wounds which were attracting flies. Severe lymphadenopathy of both prescapular and prefemoral lymph nodes was also observed. Since the clinical signs were suggestive of Lumpy Skin Disease, whole blood in EDTA vial, swabs from saliva and nasal discharge were collected and following the triple packaging system for the packing and labelling of infectious substances mentioned in OIE Terrestrial Manual 2013, the samples were forwarded from Department of Veterinary

Epidemiology and Preventive Medicine, College of Veterinary and Animal Sciences, Mannuthy to National Institute of High Security Animal Disease (NISHAD), Bhopal as per the advisory from Govt. of India for confirmatory diagnosis. Based on history and clinical signs the case was suspected for LSD and later it was confirmed as LSD by NISHAD by PCR and Real Time PCR on the saliva and nasal discharge (letter No 15-29/2019 NISHAD/2 dated 27/12/2019). This is the first confirmed report of LSD (a vector borne Capripox virus disease of cattle) from Kerala as per the available literature.

TREATMENT AND DISCUSSION

The cow was treated with Inj. Enrofloxacin @ 5 mg/kg (i/m), Inj. Flunixin meglumine @ 1.1mg/kg (i/v) for 5 days and advised herbal fly repellent spray to be applied locally on the skin to alleviate the clinical signs. The animal responded to the treatment and clinical improvement was noticed after one month. The temperature dropped to 102.4°F and 100.2°F after 24 and 48 hours of post-treatment, but nodules persisted during the course of treatment. After one month of treatment the cow recovered and nodules disappeared, but with scars on the skin.

The LSD is usually manifested as multiple, firm circumscribed nodules



Fig. 1. LSD with nodules all over the body



Fig. 2. Skin with scars after resolution of clinical signs

on the skin of head, neck, perineum, genitalia, udder, and limbs. The regional lymph nodes were enlarged 3-5 times their normal size and easily palpable. In most cases, the lesions may complicate or extend to other underlying tissues or internal organs (Abutarbush *et al.*, 2013). In LSD, the morbidity varied between 2 to 45 per cent and mortality rate was usually less than 10 per cent, but the economic losses accompanying LSD were higher. The losses were significant due to

decreased milk production, weight loss, abortion, infertility, and damaged hides (Babiuk *et al.*, 2008). Therefore, systemic antibiotic and anti-inflammatory drugs were mandatory for treatment of skin infections, cellulitis or pneumonia to avoid further complications and economic losses (Al-Salihi *et al.*, 2014). Maruthi *et al.* (2017) suggested Enrofloxacin as preferred antibiotic for treatment of skin infection, and in the current case, we used 10 per cent Enrofloxacin along with Flunixin meglumine. Animal showed remarkable improvement leaving scars on the healed skin (Fig. 2).

SUMMARY

The clinical presentation and treatment of the first confirmed case of LSD in Kerala in a cow is described. Treatment of secondary bacterial infection was successful with Inj. Enrofloxacin @ 5 mg/kg (i/m), Inj. Flunixin meglumine @ 1.1mg/kg (i/v) for 5 days and topical application of herbal fly repellent spray. Clinical improvement was noticed after one month leaving the scars on the healed skin.

Ethics statement: This study does not involve animal experimentation and was conducted on cases reported in the hospitals, following standard operating protocols of animal handling and sample examination, upon informed consent of owners.

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F. No. 15-29/2019 NIHSAD/2 Dated: 27-12-2019

To,
The Secretary,
DAHD, MoFA&D, Govt
Krishi Bhawan,
New Delhi.

Sir,

Laboratory test results of samples received for LSD testing from KVASU, Mannuthy, Kerala are below:

Ref No. and Date	Date of Sample Receipt	Place of Collection (Vill. Block, Dist.)	Sample Details (ID)	Result
PA/Vet/136/2019 dated 28.11.2019;	06/12/2019	Markode, Vaniyampara, Thiruvananthapuram	Blood ID No: 1A	Negative for LSDV by PCR and Real time PCR
No. D.1298/19 dated 24.12.19		Putikkad, Pechi, Thiruvananthapuram	Saliva ID No:1B; Nasal Discharge ID No: 1C; Skin Biopsy ID No: 2A	Positive for LSDV by PCR and Real time PCR
				Negative for LSDV by PCR and Real time PCR

DIRECTOR

Copy to:
1. Joint Secretary (LH), DAHD, MoFA&D, Govt for kind information and necessary action.
2. ABC, DAHD, MoFA&D, Govt for kind information and necessary action.
3. BRC (IAS), Indian Council for Agricultural Research, New Delhi for kind information.
4. Director, Animal Husbandry, Kerala for kind information.

Report from NIHSAD 27/12/2019

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