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Successful therapeutic management of lumpy skin disease

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Abstract

Lumpy Skin Disease (LSD) is an infectious disease caused by Lumpy Skin Disease Virus (LSDV) belonging to the family Poxviridae and genus capripox virus. This virus is antigenically closely related to sheep and goat pox virus. This mainly affects livestock population *i.e.*, cattle and water buffalos. The incubation period is between 2 weeks to 4 weeks. Mode of virus transmission mainly includes direct contact of susceptible host with diseases animal and arthropods like mosquitoes, flies and ticks. Major symptoms include enlargement of lymph node, high fever, lacrimation, nodular lesion on skin and decrease in the milk production. In Dhamtari district, Chhattisgarh six cattle were found to be suffering from LSD. The diagnosis of the disease was the combination of clinical lesion and laboratory diagnosis through RT-PCR. Cattle showing prominent clinical sign were immediately segregated from the healthy herd. All the animal were therapeutically managed with antibiotic, analgesic, ivermectin and B Complex for a week. All the animals recovered after 2 weeks of the treatment. The aim of this paper was to show that LSD could be successfully managed by timely treatment and isolation of diseased animals from healthy ones to prevent the spread of disease. Vaccination is the most effective way to control the disease.

Keywords: Therapeutic management, lumpy skin disease virus, genus capripox virus

Introduction

Lumpy Skin is a viral trans-boundary disease affecting small and large animal population across the world. It is endemic in several parts of the world including middle-east Asian counties and Africa continent but now it has spread to other part of the world. In 2019 LSD was reported in Odisha since then, several report have been found from various states of India (Gupta *et al.*, 2020) [6]. LSD affects livestock population, mainly cattle and water buffalos population causing immediate crisis in the animal husbandry sector (Ratyotha *et al.* 2022). All the age groups and both the genders are equally susceptible. About 15% of worlds livestock population is in India which plays a significant role in contributing in countries GDP *i.e.*, 6.20% (Basic Animal Husbandry Report 2021) [3]. LSD is a economic important disease as it causes a net economic loss of INR 18337.76 crore (USD2217.26 million) (Singh *et al.*, 2023) [10]. LSD is causing huge economic loss to the farmers and to the whole country. It peculiar clinical feature is presence of Nodule on the skin of animal including head, neck, limbs, genitalia and udder. There is enlargement of the lymph nodes mainly sub scapular and pre femoral. It causes significant reduction in milk production, abortion and infertility many cases. Course of disease varies according to severity of clinical lesion. There is no specific treatment of LSD in the world it can only be successfully handled by treatment and management changes. Quarantine, restriction of animal movement and control of vector is an important step toward control of disease. Vaccination or immunoprophylaxis is the only way for control of LSD.As per OIE, in India four strain of capripox virus can be used for vaccination in live attenuated form (Brenner *et al.*, 2006) [4]. Recently, Lumpi-ProVac vaccine has been developed in India for controlling LSD with the collaboration of two institute *i.e.*, National Equine Research centre, Hisar Haryana and Indian Veterinary Institute Bareilly, Uttar Pradesh.

Materials and methods

Six female cattle of age group between three to five years were presented to Veterinary Hospital, Dhamtari, Chhattisgarh with the complaint of anorexia, hyperoxia, lameness, lacrimation and nodular lesions all over the body. History revealed free grazing system of practice for rearing the animals without proper vaccination and deworming or any kind of prior

treatment for the nodules. On clinical observation the animals were dull, depressed and dehydrated. On clinical examination, four animals had fever and lethargic to move. Physical examination revealed enlarged lymph nodes and presence of nodules all over the body including limbs, udder and abdomen (Figure 1). Hematology and serum biochemistry revealed leukocytosis with lymphocytopenia and increase in the aspartate aminotransferase. Skin scraping and fecal sample were found to be negative for ectoparasite and endoparasite, respectively. Based on the clinical signs, hematology and serum biochemistry, all the six animals were tentatively diagnosed with Lumpy Skin Disease and for further confirmatory diagnosis the nasal swab, fecal samples and whole blood sample were collected and sent to National Institute of High Security Animal Disease (NIHSAD), Bhopal for confirmatory diagnosis of Lumpy Skin Disease through Real Time-PCR. All the suspected animals were found positive for Lumpy Skin Disease through RT-PCR from the nasal swab. All the six animals were isolated from other cattle population. The animals were treated with Inj. meloxicam @ 0.5 mg/kg SID I/M for three days, 10% oxytetracycline @ 10 mg/kg SID I/M for 5 days and ivermectin @ 0.2 mg/kg S/C once and Inj. belamyl @ 5 ml SID I/M for 5 days. For cleaning of the skin open wounds 10% liquid betadine was advised and the owners were advised to apply ointment containing gamma benzene hexachloride on open wounds twice daily.

Results and Discussion

All the animals diagnosed with LSD were treated with antibiotics, analgesics and supportive therapy. After 24 hours of treatment, fever subsided and after ten days of treatment the animals regained their normal appetite. After fourteen days animal fully recovered with no nodular lesion on the body (Figure 2).

Lumpy skin disease is a viral transboundary disease caused by Lumpy skin disease virus (LSDV), a member of genus Capripox virus which belongs to family Poxviridae. This virus is closely related (antigenically) to sheep and goat pox virus (Woods, 1988) [11]. LSD is also known as knopvelsiekte, pseudo-urticaria and Neethling virus (Chaudhary *et al.*, 2022) [5]. Among livestock cattle are more affected as compare to buffalo. Under field condition the incubation period is between 2 weeks to 5 weeks. Arthropods like common biting flies, mosquitoes and ticks are primarily responsible for LSD transmission. Warm and humid climate favor the spread of LSD as this climate is suitable to increase in the number of vector population (Halder *et al.*, 2022) [7]. The heifers and calves are more severely affected than younger ones. Direct contact of susceptible animal to host is also the major factor for the spread of the virus. Virus can persist in the semen of affected bull for about 22 days and they remain the source of infection for long time (ICAR, ATARI 2022) [8]. Female animals can transmit the disease to suckling calves via milk. Disease have high mobility and low mortality. Death is usually common among the affected young calves (Wani, 2022) [1]. The major symptoms include enlargement of lymph nodes, fever, lacrimation, reduced appetite, nodular skin lesion throughout the body, lameness and reduction in milk production. Among all of these peculiar lesions include nodular lesion in skin which sometime opens up that cause bleeding and formation of deep wound. The diagnosis of the disease is mainly through clinical sign and laboratory diagnosis by RT-PCR. Quarantine, restriction of animal

movement and control of vector is an important step toward control of disease. Vaccination or immunoprophylaxis is the only way for control of LSD.



Fig 1: Animal before treatment (LSD)



Fig 2: Animal after treatment (LSD)

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