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Popular Article

Overview of Lumpy Skin Disease in Cattle

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Abstract

Lumpy skin disease is a viral infection of livestock mainly cattle and buffalo. The prominent clinical signs present in most of the animals are presence of cutaneous nodular lesion, which was seen mainly in the following region in descending order - neck, face, lateral aspect of abdomen, thigh and perineum. Although there are various diagnostic aids available for detection of lumpy skin disease, diagnosis based on history and clinical signs remains the most reliable one in field conditions. This disease has adverse effect on the economy of the country as it affects the milk production. Most of the farmers in India rely on the livestock for their livelihood. The negative effects of the disease on production and reproduction abilities of the animal impose a threat to farmer's livelihood.

Introduction

Lumpy skin disease (LSD), which is caused by Neethling virus or Lumpy skin disease virus, is a contagious viral disease of cattle. Lumpy skin disease virus (LSDV), a double stranded DNA virus belongs to the genus Capripoxvirus of family Poxviridae along with Goatpox virus (GTPV) and Sheeppox virus (SPPV) [1]. LSDV shares strong antigenic relationship with SPPV and GTPV and consists of genome of approximately 151-kbp and contains 156 genes [2, 3]. LSD is of great importance because of its negative impact on economy through production losses and reproductive failure and hence listed as notifiable disease by OIE. Certain breeds like Jersey and Holstein-friesian belonging to *Bos taurus* are susceptible to LSD compared to *Bos indicus*. Apart from cattle, natural

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infection of LSD was also reported in Asian water buffaloes (*Bubalus bubalis*) [4]. However, cutaneous lesions were produced by experimental inoculation of LSDV in wildlife species such as giraffe (*Giraffa camelopardalis*) and impala (Aepyceros melampus) [5].

Epidemiology

The first case of LSD was reported in Northern Rhodesia (now called as Zambia), Africa in 1929[6]. The disease was confined to African continent for more than fifty years after which it was reported in Egypt in 1988 [7, 8]. Between 2014 and 2017, LSDV expanded its infection to European countries such as Greece, Turkey and Balkan countries including Albania, Macedonia and Bulgaria [9, 10, 11]. In 2019, the infection was introduced into South Asian countries like Bangladesh followed by India and China which then spread to Nepal in 2020 [12,13,14].

In India, the first report on LSD in cattle was recorded in 2019. In 2022, the outbreak of lumpy skin disease in India began in the month of April which reached peak in September. The northern states of India like Rajasthan, Punjab, Gujarat, Haryana, Maharashtra were affected severely during this outbreak with high mortality rates.

Transmission

The major mode of transmission of LSD occurs through arthropod vectors [15]. The vectors involved in mechanical transmission include *Stomoxys calcitrans* , *Musca domestica* , *Aedes aegypti*, amblyomma hebraceum [16, 17, 18, 19].

CLINICAL SIGNS

The common clinical manifestation of the disease include development of firm circumscribed nodules of about 5-50 mm in diameter in skin around head, neck, perineum, udder and the limbs which later becomes harder and necrotic [20]. The nodules are non-fluctuating, painful and hard to touch.

The other noticeable signs include

- Pyrexia
- Decreased milk yield (dysgalactia)
- Ocular discharge (lacrimation),
- Labored breathing (dyspnea)
- Lymphadenopathy
- Hypersalivation
- Lameness.

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Diagnosis

The virus neutralization test remains gold standard test among other serological test for diagnosis of LSD [21].

The other diagnostic tools for detection of LSD include

- Molecular PCR [22]
- Real-time PCR [23],
- ELISA [24],
- Indirect fluorescent antibody test [25].

Treatment

There is no specific treatment for lumpy skin disease. The infected animals should be treated symptomatically. The most common treatment protocol includes use of broad-spectrum antimicrobials belonging to the class of tetracycline, aminoglycoside and beta lactam to mitigate the secondary bacterial infection along with anti-inflammatory and antihistamines.

Ethno-Veterinary Practice

The ethno-veterinary treatment alongside allopathic therapy has showed proven results and is commonly recommended by clinicians recently.

Oral Preparation

Beetal leaves	10 No.
Pepper	10g
Jaggery	200g
Rock salt	10g

Topical Preparation

SCIENTIFIC NAME	**COMMON NAME**	**QUANTITY**
Azadirachta indica	Neem leaves	One handful
Ocimum tenuiflorum	Tulasi leaves	One handful
Acalypha indica	Kuppaimeni	One handful
Lawsonia inermis	Henna	One handful
Curcuma	Turmeric	20 grams
Allium sativum	Garlic	10 No.
Cocos nucifera	Coconut oil	500 ml

The above-mentioned ingredients should be grinded completely. Subsequently, it should be mixed in coconut oil and boiled. The oil is then allowed to cool. Then it should be applied throughout the skin. This topical therapy has to be done for five times a day for first two days and twice a day until complete cure.

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Control and Prevention

The most practical control measure for LSD during an outbreak is emergency immunization followed by restricting the movement of infected animal and vector control [26].

Discussion

Most the animals showed positive response for this combination therapy approximately after 10 days. This is indicated not only by gradually disappearance of lesions but also animal's appetite as well as rectal temperature became normal. The complete recovery was noticed nearly after a month. Regression of skin nodules was spotted and they were replaced by scars. Few animals developed open wounds following the nodules and the use of topical preparation aided to alleviate it. The systemic therapy was done for five consecutive days. The broad-spectrum antibiotics were used to treat secondary bacterial infections. The ethno-veterinary treatment which uses the medicinal plants had proven results. These herbal plants are not only easily accessible but also cost effective thereby making it affordable for farmers.

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