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Research Article

Future Herbal Treatment for Lumpy Skin Diseases in Cattle: A Systematic Research

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Abstract

Lumpy Skin Disease (LSD) is an emerging infectious disease in cattle in India caused by viruses of the family Poxviridae and genus Capripoxvirus. Lumpy skin disease virus causes a serious disease in cattle, characterized by lumps in the skin. The mortality rate of this disease is very high which can affect the economy of India. Therefore, after knowing the correct diagnosis, treatment and economic importance, it is necessary to take preventive measures to avoid further outbreaks. Control of arthropod vectors is also essential. Vaccination is the most effective means of control. During the past five years the lumpy skin disease has spread from the Middle East to Southeast Europe, the Caucasus, South-West Russia and Western Asia. The herds affected by this disease cause considerable damage with significant economic consequences. It also blocks affected countries' access to lucrative export markets, reducing the financial impact of the LSD outbreak. It is imperative to find early treatment and vaccine for the prevention of nodular skin disease (LSD), only then we can bring an emerging infectious disease in cattle under control. We can also cure Lumpy skin disease (LSD) with herbal treatment we have seen some evidence of this in our research.

Keywords: Diagnosis; Etiology; Herbal; Lumpy virus; Transmission; Treatment; vaccine

Introduction

Lumpy skin disease is caused by the Lumpy Skin Disease Virus (LSDV), which belongs to the genus capripoxvirus, a part of the poxviridae family (smallpox and monkeypox viruses are also a part of the same family). The LSDV shares antigenic similarities with the Sheep Pox Virus (SPPV) and the Goat Pox Virus (GTPV) or is similar in the immune response to those viruses. It is not a zoonotic virus, meaning the disease cannot spread to humans. It is a contagious vector-borne disease spread by vectors like mosquitoes, some biting flies, and ticks and usually affects host animals like cows and water buffaloes [1]. It will also address the propagation and economic significance of the disease [2-3] as shown in (Figure 1).

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Transmission

- By movement of affected animals
- By biting insects or parasites such as flies, mosquitoes and ticks
- By contaminated equipment
- Directly from animal to animal in some cases.

Figure 1: A Showing Skin Lesions of LSD in Cattle.

Clinical Signs and Symptoms

The incubation period of the disease is 2-5 weeks. The major clinical signs of the disease are characteristics circular skin nodules of over the body, fever, palpable enlarged subscapular and prefemoral lymph nodes, lacrimation, keratitis, nasal discharge, drop in milk yield, offfed, emaciation, depression and reluctance movement. Morbidity and mortality of the disease is 5-45 and 1-5%, respectively [4].

Diagnosis

Other clinical signs include general malaise, ocular and nasal discharge, fever, and sudden decrease in milk production. Morbidity and mortality in the recent Eurasian epidemic has been approximately 10% and 1% respectively. The severity of disease in the 10% of affected cattle in the herd can vary from mild to fatal. Some cattle develop very small numbers of nodules which can be difficult to spot. Others develop innumerable nodules up to 3cm in diameter. The factors determining which cattle develop mild and which develop severe disease are unknown. Disease can be confirmed with a laboratory diagnosis, with tests available to detect the DNA of the virus or antibodies. LSD can be confused with many diseases, including: Pseudo

lumpy skin disease (caused by Bovine Herpesvirus 2), Bovine papular stomatitis (Parapoxvirus), Pseudocowpox (Parapoxvirus), Cowpox, cutaneous tuberculosis, Demodicosis (Demodex), insect or tick bites, urticarial, photosensitisation, Papillomatosis (Fibropapillomas, "warts"), Rinderpest, Dermatophilosis, Besnoitiosis, Hypoderma bovis infection and Oncocercosis. Signs such as fever and milk drop are non-specific, and can be seen with many other diseases [5].

Laboratory diagnosis

Various Tests including Virus neutralization test, indirect fluorescence test, Agar gel immunodiffusion test, ELISA and the Western blot test [6] are used.

Virus isolation

Virus isolation is critical in the confirmation of clinical disease and determination of the isolate. This is the method used in the samples to test the virus's viability [7].

Prevention

Control and prevention of lumpy skin disease relies on four tactics - movement control (quarantine), vaccination, slaughter campaigns and management strategies. Specific national control plans vary between countries and so advice should be sought from the relevant authorities and veterinarians. Vaccination is the most effective means of control, and live homologous vaccines containing a Neethling-like strain of LSDV are recommended [8].

Control

Control of Lumpy skin disease by quarantine and movement control is not very effective because biting flies and certain tick species are most probably the most important method of transmission of the disease. Although, the control of insects was not effective in preventing the spread of LSD, but use of insecticides together with repellents can be an aid in the prevention of the spread of LSD. LSD outbreaks can be eradicated by quarantines, depopulation of infected and exposed animals, proper disposal of carcases, cleaning and disinfection of the premises and insect control. LSD control can only be by vaccination or immunoprophylaxis [6]. Herefore, in order to come across these alarming situations, the following recommendations are forwarded.

- Clinico-hematological and biochemical profile of cattle affected by LSD need to be identified in addition to typical clinical signs.
- Accurate on time diagnosis is needed for control measurements.
- Annual vaccination strategy with homologous strain of the LSDV is obligatory in endemic areas.
- Vector control and animal movement restriction during active period of insect movement is important.
- Bulls used for breeding need to be diagnosed for LSDV [7].

Vaccination

Homologous live attenuated virus vaccine (Neethling strain: immunity conferred lasts up to 3 years). Heterologous live attenuated virus vaccine (Sheep or goat pox vaccine, but may cause local, sometimes severe reactions). This vaccine is not advised in countries free from sheep and goat pox because the live vaccines could otherwise provide a source of infection for the susceptible sheep and goat populations. There is no new generation recombinant capripox vaccines are commercially available [6].

Treatment

There is no treatment for the virus, so prevention by vaccination is the most effective means of control. Secondary infections in the skin may be treated with Non-Steroidal Anti-Inflammatories (NSAIDs) and also antibiotics (topical +/- injectable) when appropriate [8].

Treatment methods

The treatment is done on symptom basis. However, the secondary bacterial infections can be avoided by the use of antibiotics and supportive care. Anti-inflammatory drug is also given to reduce pain [9-10] and to increase the appetite of the cattle.

Allopathic treatment

- Antiseptic with Herbal Spray
- Levamisole (immunomodulatory drug)
- Antihistamines 10ml daily for three days
- Antibiotics e.g., Amoxicillin at the dose of 3-4 gm total or 10-12 mg per kg body weight.

Herbal Treatment : Ethno veterinary formulation: (For oral administrations)

First Preparation

Ingredients: (For one dose)

- Betel leaves-10 nos.; Black pepper-10g: Salt-10g

Preparation

- Blend to form a paste and mix with jaggery
- Feed the dose in small portions orally
- Feed one dose every three hours for the first day (Day 1)
- Feed three doses daily from the second day onwards for 2 weeks (Day 2 onwards)

Second preparation

Ingredients: (For 2 doses)

- Garlic-2 pearls
- Coriander- 10g
- Cumin-10g
- Tulsi-1 handful
- Dry cinnamon leaves-10g
- Black pepper-10g
- Betel leaves-5 nos
- Shallots-2 bulbs
- Turmeric powder-10g

- Chirata leaf powder- 30g
- Sweet Basil- 1 handful
- Neem leaves-1 handful
- Aegle marmalos (Bel) leaves-1 handful
- Jaggery-100g

Preparation

- Feed the dose in small portions oral
- Feed one dose every three hours for the first day (Day 1) evening second
- Feed two doses daily in the morning and condition resolves (2 day onwards)

Third Preparation for external application (if there are wounds):

Ingredients

- Acalypha indica leaves- 1 handful
- Garlic- 10 pearls
- Neem leaves- 1 handful
- Coconut or Sesame oil- 500ml
- Turmeric powder- 20g: Mehandi leaves
- 1handful: Tulsi leaves- 1handful.

Preparation

- Blend all the ingredients thoroughly.
- Mix with 500ml coconut or sesame oil and boil and bring to cool.

Application

Clean the wound and apply directly.

If maggots are seen

Apply Anona leaf paste or camphorated coconut oil for the first day only if maggots are present.Studies have also shown that steps taken to control the arthropod vectors have proven to decline the number of cases.

Methods and Materials

We conducted this research paper by observing the different types of reviews, as well as conducting and evaluating literature review papers.

Results

We found in our research that Lumpy Skin Disease (LSD) is an emerging infectious disease in cattle in India caused by viruses of the family Poxviridae and genus Capripoxvirus. Lumpy skin disease virus causes a serious disease in cattle, characterized by lumps in the skin. The mortality rate of this disease is very high which can affect the economy of India. Therefore, after knowing the correct diagnosis, treatment and economic importance, it is necessary to take preventive measures to avoid further outbreaks. Vaccination is the most effective means of control. Herds affected by this disease cause considerable damage with significant economic consequences. It also blocks affected countries' access to lucrative export markets, reducing the financial impact of the LSD outbreak. Early treatment and vaccine finding is essential for the prevention of nodular skin disease (LSD), then only we can bring the emerging infectious disease in cattle under control. We can also cure Lumpy skin disease (LSD) with herbal remedies, we have seen some evidence of this in our research.

Future Aspect

It represents the second iteration of the Guidelines in the Future. There are many aspects to diagnosis, evaluation and treatment that could be further clarified. In the future, interventions related to may be undertaken.

Conclusion

In our research, we concluded that Lumpy Skin Disease (LSD) caused by viruses of the family Poxviridae and genus Capripoxvirus. Lumpy skin disease virus causes a serious disease in cattle, characterized by lumps in the skin. The mortality rate of this disease is very high which can affect the economy. Vaccination is the most effective means of control. Herds affected by this disease can cause significant damage with significant economic consequences. It can also block affected countries' access to lucrative export markets, reducing the financial impact of an LSD outbreak. Early treatment and vaccine finding is essential for the prevention of nodular skin disease (LSD), then only we can bring the emerging infectious disease in cattle under control. We can also cure Lumpy skin disease (LSD) with herbal remedies, we have seen some evidence of this in our research.

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Author's Contribution

The first authors developed the proposal, undertook the literature search and review, and then collect and analyse the data under supervision of my respective advisers. The second author gives constructive comments and guidance and work with the main author with respect to the research objective.

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