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Conceptual Paper

Lumpy Skin Disease in Cattle - Treatment and Control Measures

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Lumpy skin disease (LSD) is an infectious, fatal disease of cattle. It is caused by a virus of the family Poxviridae characterized by nodules on the skin and other parts of the body which is aggravated due to secondary bacterial infection. Traditionally, lumpy skin disease is found to affect cattle of most of the African countries followed by several countries of the Middle East. Outbreak of lumpy skin disease were reported in Georgia, Russia, Bangladesh, Pakistan and the People's Republic of China recent past which has caused international concern. The disease was not recorded in Australia or New Zealand. In India so far it has infected around 20.56 lakh cattle, caused nearly 1.00 lakh death and spread to 24 States and Union Territories namely Kerala, Tamil Nadu, Goa, Rajasthan, Punjab, Gujarat, Himachal Pradesh, Uttarakhand, Haryana, Madhya Pradesh, Uttar Pradesh, Bihar, Jammu, Kashmir and Delhi. The worst – hit states are Rajasthan, Punjab, Gujarat, Himachal Pradesh and Haryana.

Etiology and epidemiology

The causal virus is related to that of sheep pox. Lumpy skin disease occurs epidemically or sporadically and new foci of infection generally appears in areas far away from the initial outbreak. Its occurrence is highest in wet summer season due to high temperature and high humidity, but it may occur in winter season also. The transmission of virus occurs through blood, nasal discharge, lacrimal secretions, semen, saliva and infected milk to suckling calves. African buffalo is reported as maintenance hosts in Africa, but other wildlife species may also be involved. Morbidity is 25%-50% due to reduced milk yield, poor body condition and rejection of the hide. Mortality is usually low [1].

Clinical findings

Infected cattle develop fever, lacrimation, nasal discharge, hyper salivation, and edematous swelling in their limbs and exhibit lameness. The incubation period is 4-14 days. The disease often renders poor growth, low milk yield, debility, infertility, severe damage of skin, emaciation and sometimes death. Sometimes condition becomes more aggravated due to secondary bacterial infection. So, the disease has an important economic impact in dairy and beef industry [2].

Figure 1: Lumpy skin disease in cattle, ulcers (COURTESY OF DR. MAX BONNIWELL, OBAN, SCOTLAND).

Diagnosis

The differential diagnosis of the Lumpy Skin Disease must be made with the less clinically important pseudo-lumpy skin disease, which is caused by bovine herpes virus 2. Pseudo-lumpy skin disease is a milder disease than true lumpy skin disease, but differentiation depends essentially on isolation and identification of the causal virus. The pox virus of lumpy skin disease can be identified by electron microscopy in the early skin lesions. The two diseases can be distinguished by PCR [4].

Treatment and Prevention:

There is no treatment for the virus, however, administration of antibiotics such as penicillins, cephalosporins, tetracyclines, fluroquinolones etc. for 5 - 7 days depending on severity of the disease, good care and management are recommended to control secondary infection [4]. So, prevention by vaccination with attenuated virus offers the most promising method of control the spread of the disease.

Treatment

- Antiviral treatment with Methylene Blue (MB). It is a broad-spectrum antiviral agent and its anti-viral properties are well-known against a wide variety of viruses. MB will help in the treatment of LSD through its multi-mechanism antiviral action.

Figure 2

It helps in faster recovery and decreases the mortality rate. As per the document released by the Ministry of Fisheries, Animal Husbandry & Dairying, GOI, treatment by Methylene Blue may be administered as follows: - Oral treatment with 0.1 % Methylene Blue (MB) solution (1 gram of MB powder in 1 Litre of water) may be considered by the veterinarian, with dosage as follows: Adult cows (of approximately 350 kg body weight): 300 ml at 8 hourly intervals (thrice in a day) for 4 days. Calf: give approx. half dose. MB solution / Preparations may also be used topically (eg. by spray). As a precaution: milk withholding interval of 4 days and a meat withdrawal interval of 14 days is advised. Safe dosage is upto 5 mg / kg body weight/ day [3].

- Use of non-steroidal anti-inflammatory drug to treat the inflammatory condition, use of antipyretic for high fever and use of antibiotics to control secondary infection.

Recommendation of NDDB on the use of ethno veterinary preparations

First preparation

Betel Leaves - 10 number, Black pepper - 10g, Salt - 10g; Jaggery- 50g would be taken for one dose, blended properly to form a paste. It should be given to cattle orally, on the first day one dose every three hour and from second day onwards three doses daily for three weeks. Each dose should be freshly prepared.

Second preparation

Garlic - two pearls, Coriander - 10g, Cumin - 10g, Thulsi - one handful, Bay leaves - 10g, Black pepper - 10g, Betel leaves - 5 numbers, Shallots - 2 bulbs, Turmeric powder - 10g, Chirata leaf powder - 30g, Sweet basil - one handful, Neem leaves - one handful, Aegle marmolos (BEL) Leaves - one handful, Jaggery-100 g would be taken for two doses. All the ingredients would be blended to form a paste. It should be given orally, on first day one dose every three hour intervals and from second day twice daily ie morning and evening till condition resolve. Each dose should be freshly prepared.

For external wound

Acalypha Indica leaves - one handful, Garlic - 10 pearls, Neem leaves - one handful, turmeric powder - 20 g, Mehendi leaves - one handful, Tulsi leaves - one handful Coconut or Sesame oil - 500 ml, would be taken. Then blend all the ingredients and mix with 500 ml Coconut or Sesame oil. Then boil it and wait to cool. Afterwards clean the wound and apply directly.

Prevention

Following preventive measures should be implemented to prevent LSD incidences

- The movement of animals to and from the infected area and from affected states should be completely banned. This will check the transmission of LSD. The movement of people to and from the affected area should be restricted. The animal handlers and those attending to the affected animals should be advised to keep away from healthy animals. It is, therefore, of utmost importance to ensure these safety measures.
- The infected villages are identified so that precautionary measures such as ring vaccination of cattle and buffalo would be carried out in villages up to 5 km around the affected village. Animals should be vaccinated with the available Goat pox vaccine at the age of 4 months and above subcutaneously. However, recently LSD vaccine was developed jointly by ICAR - IVRI & ICAR - NRCE and launched by Ministry of Agriculture and Farmer Welfare, Govt. of India.
- In any case affected animals should not be vaccinated. Preventive vaccination should also be undertaken in high risk areas like border area of affected district and state. The staff and vaccinators should be well aware of the latest vaccination protocol.

Bio-security measures:

- Immediate isolation of sick animals from the healthy animals followed by symptomatic treatment need to be carried out with all precautions and biosecurity measures. Feeding of green fodder is recommended. Herbal acaricide would be applied to healthy animals in the infected and surrounding farms. Control of vector population in the animal shed would be carried out using insecticide, repellents and other chemical agents. Fogging would be undertaken in the animal sheds, common grazing area, veterinary hospital and dispensaries also.
- Hygiene practices should be followed at the animal farm in areas where animals are infected. Disinfection of affected premises, vehicles plying through the affected farm should be carried out with disinfectants eg Ether (20 %), chloroform, formalin (1 %), phenol (2 % / 15 minutes), sodium hypochlorite (2 - 3%), iodine compounds (1:33 dilution) and quaternary ammonium compounds (0.5%).
- The veterinary staff dealing with the infected animal should take proper protection by wearing gloves and face masks and carry out hygienic and disinfection measures at all times to

prevent the further spread of disease to other farms / households.

- Clinical surveillance against LSD in affected villages should be intensified. Carcass should be disposed of scientifically observing all hygienic measures. Cattle markets should be closed. Participation in exhibition and shows should be stopped immediately upon confirmation of the disease in the affected areas. Semen from affected animals should not be collected and processed for production and distribution.

Related suggestions as per guideline of Department of Animal Husbandry and Dairying, GOI, New Delhi

- Strict implementation of advisories, bio-security measures, isolation of affected animals, movement restriction of animals, movement control of vehicle from affected area to free area is to be implemented.
- Disinfection measures to be followed strictly in liaison with local administration including regular fogging and lime spray in the infected and surrounding area. Monitoring of pastures, grazing area, water bodies, feed and fodder would be done to prevent contamination by infected animal. The milk of infected animals should not be used and mixed in the milk of healthy animals.
- Stray animals would be monitored regularly and the affected animals should be isolated under veterinary care with the help of local administrative authorities. Surveillance of vector should also be undertaken by sending the samples to state and central disease investigation laboratory to understand disease epidemiology and formulating future action plans.
- Unnecessary post-mortem and sampling of infected animals would be avoided to prevent spread of disease. The sampling should be done as per the prescribed SOP and protocol with due care at all times and proper and safe transport shall be ensured.
- The veterinary hospitals, dispensaries and MVU should have sufficient supply of medicines, supplements, disinfectants, treatment accessories, etc. Control room and 24x7 toll free number to be activated to address the issues of farmers immediately.
- Door to door awareness and vaccination drive should be undertaken with the help of NGOs, and other stakeholders. Milk collection centers should ensure healthy milk collection without mixing of the milk of infected animals. State Animal Husbandry Department should maintain proper liaison with police and border agencies to check illegal entries of cattle from neighbouring countries.

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