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Editorial

Lumpy Skin Disease: A threat to the Indian Dairy Sector

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Introduction

The lumpy skin disease is a nodular eruptive condition of the bovines especially the cattle caused by a lumpy skin disease virus (LSDV) characterised by fever, hypersalivation, lachrymation followed by the development of the nodular lesions on the oro-pharyngeal region, udder, genitalia, rectum, hide etc. and occasionally ends into the fatal outcome.

It was first reported in Zambia in 1929. Thereafter, it gets spread to Africa region followed by most of the countries of the world by the means of the biting insects, the migration of the flock or animals etc. According to OIE, it is a notifiable disease. It is a transboundary animal disease (TAD) which is highly contagious and have high potential of crossing the national borders and causing the severe socio-economic and public health consequences. First reported in India in 2019 and then, after caused a devastating response till now.

Etiology

The Lumpy skin disease virus, a member of genus Capripoxvirus, family Poxviridae. It consists of the linear dsDNA as its genome which is non-enveloped having complex symmetry.

Epidemiology

The morbidity rate varies between 10 and 20% while the mortality rates of 1 to 5% are considered usual.

Host

It mainly affects the cattle (*Bos indicus* and *Bos taurus*) and upto some extent the water buffaloes also. Few cases of LSD have also been reported in the wild ruminants. The wild ruminant considered to be as reservoir of this disease such as African cape buffalo.

Risk factors

- **Environment**: High number of vectors, standing water, dunghills, grasslands suitable for ticks, etc.
- **Season**: High temperature and high humidity of the environment leads to more vector population which ultimately leads to the high LSD cases.
- **Cattle movements from affected to disease-free regions**: Trade, grazing, nomadic and transhumance farming, legal and unauthorised transboundary animal movements, lack of testing regimen for imported animals etc.
- **Farming practices**: Contacts with neighbouring herds, purchase of new animals from untrusted sources, use of a local breeding bull, cattle not monitored on regular basis etc.

Transmission

It is mainly transmitted among the animals mechanically by the biting insects such as mosquitoes (*Culex mirificens* and *Aedes natrionus*), biting flies (*Stomoxys calcitrans* and *Biomyia fasciata*), male ticks (*Riphicephalus appendiculatus* and *Amblyomma hebraeum*) etc. It also gets spread via the infected saliva among the herd. It is also reported to be shed in semen, milk and nasal secretions.

Public health significance

It gets transmitted to the animal handlers via direct contact with the lesions, thus posing a zoonotic risk. Lumpy skin disease virus is capable of infecting humans with direct transmission without the need for insect vector; most probably by inhalation and certainly by the direct contacts with infected materials, infected persons [man to man], and as laboratory acquired infection. LSDV causes skin nodules and may lead to death in cases of generalized infections if involves the internal organs.

Clinical signs

The incubation period of is reported to be approximately 14-28 days. In acute cases, initially there is fever of over 41^0 C and last for a week. All superficial lymph nodes get enlarge. In lactating cows, milk production is significantly reduced. There are multiple characteristic integumental lesions, well circumscribed to coalescence, 0.5-5 cm in diameter, with hard, flat papules and nodules. These nodules are creamy grey to white in the cut area and may initially shed serum, but in the next two weeks, a conical central core or necrotic/necrotic plug ("Sitfast").

Diagnosis

For diagnosis, the samples include the nodular lesions over the coat, scab, crust over the body outer coat, blood (7-21 days post infection), ocular discharge, nasal discharge, and semen. Virus confirmation can be carried out by histopathological examination, virus isolation followed by Polymerase chain reaction and electron microscopy.

Differential diagnosis

Milder form needs differentiation from Bovine herpes mammillitis (bovine herpesvirus 2) (sometimes known as pseudo-lumpy skin disease), bovine papular stomatitis (Parapoxvirus), pseudo cowpox (Parapoxvirus), Vaccinia virus and Cowpox virus (Orthopoxvirus) infection.

Treatment

There is not any proper recommended treatment for the virus. To prevent the secondary bacterial infections of the skin, it may be treated with non-steroidal anti-inflammatory drugs (NSAIDs) and antibiotics (topical +/- injectable) also when appropriate. The antibiotics ointments should be applied in case of need.

Prevention

Vaccination

- Both homologous (Neethling LSD strain) and heterologous (SPPV and GTPV strains) vaccines are used against LSD.
- Only live attenuated vaccines are currently available for LSD. The 'Differentiating Infected from Vaccinated Animals' (DIVA) vaccine is currently not available for LSD.

Note: Only healthy animals should be vaccinated with a live vaccine. Vaccination of already infected animals leads to more severe disease and potential recombination of vaccine and field strain.

Environmental measures

- Application of mosquito nets around animals to prevent the mosquito bite.
- There should be proper water and sewer drainage.
- Proper disinfection of the surroundings and animal barn with phenol (2%/15 minutes), sodium hypochlorite (2-3%), iodine compounds (1:33 dilution), Quaternary ammonium compounds (0.5%), ether (20%) and formalin (1%).

Animal measures

- Application of the ectoparasites repellent over the body coat of the animal to avoid the bite of blood feeding insects such as *Stomoxys* spp.
- Proper quarantine measures for the new coming animal in the herd and proper isolation of the affected animal.

Animal handler prophylaxis

- There should be hygienic practice in milking of the animal of the affected animal.
- Proper use of gloves and masks while providing the feed and water to the suspected and affected animal.
- Proper use of the hand sanitizers regularly.