

Lumpy Skin Disease

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Introduction

Lumpy skin disease caused by virus of genus Capripox and in form of brick shaped double stranded DNA belongs to family Poxviridae. The virus is highly host specific and causes disease only in cattle and buffalo. It's an emerging viral disease of Cattle and Buffalo in India. Lumpy skin disease was first reported in 1929 in Zambia. From 2012 it's spreading rapidly from African countries to Middle East Asia and South Eastern Europe. Lumpy skin disease causes high morbidity and low mortality. It is a deadly and devastating disease causing severe economical losses in terms of sudden fall in milk yield in female animals, loss of draft power in male animals, treatment cost and permanent damage to hide, although this skin disease doesn't have zoonotic importance. Infection spreads faster in warm and wet weather. In India Lumpy skin disease was first reported in Orissa state in August 2019.



Figure: 1 Bullock with nodules on the body

Transmission:

Direct contact from affected animals, contaminated feed and water, iatrogenic transmission from contaminated needles and from all biting flies including mosquitoes and ticks transmits the virus from infected animals to healthy animals. Virus has been isolated from blood, saliva, ocular discharge, nasal discharge and from semen of infected animals.



Figure: 2 Bullock with nodules on the body.

Incubation period: usually varies from 2 to 5 weeks.

Pathogenesis: After entry of virus from bite of the insects or other route of entry, there will be viremia followed by the virus localization in skin and mucus membrane which leads to formation of lumps of size 0.5- 5cm in diameter. Later lumps undergoes necrosis and become atrophied leading to formation of scab which detaches from the body leading to ulcers or wound formation. These wounds on secondary bacterial invasion leads to pyogenic wound or on fly strike leads to myiasis causing permanent damage to hide. The detached scab is abundant in virus and acts as potential source of infection.



Figure: 3 Brisket edema with nodules on the body of bullock

Clinical Signs: Varies from animal to animal. All age group of animals are equally susceptible. Among all animals young calves and lactating cows are more severely affected. Clinical signs include pyrexia (up to 106⁰F), dullness, depression, anorexia, formation of raised unequal sized lumps on the skin and mucous membrane size varying from 1- 5cm diameter which are found all over the body of animal including head, neck, tail, udder, scrotum, perineum, genitalia and limbs. These lumps are raised from skin, firm and painful on palpation. Enlarged superficial lymph nodes, edema of brisket and limbs, sudden fall in milk yield, loss of draft power in male animals, excessive salivation, rhinitis, conjunctivitis and lameness due to tendons affected by the lumps on the limbs and pregnant cows may abort. In the course of disease these lumps will become necrotic and ulcerate and may predispose to myiasis by fly strike. Animals with or without brisket edema and nodules, animals with or without nodules and having brisket edema, are observed by physicians. In aborted animals fetus having small coin like reddish lesions are seen all over the body having size approximately 0.5 to 1cm diameter.



Figure :4 Calf with various sized lumps

Outcome of disease: Recovered animals becomes emaciated and needs more care and time for complete recovery. Due to affection of tendon and joints animals may show permanent lameness. Infected bulls secrete the virus in semen and is source of infection to female animals. Permanent damage takes place to hide. Sudden fall in milk yield is noted. Abortion of pregnant animal and long standing anoestrus is seen in recovered animals leading to huge loss to dairy industry. Recovered animals have solid immunity. Bulls become temporary or permanent infertile. Disease predisposes the conditions like secondary pneumonia, emaciation and mastitis.



Figure : 5 Bullock with necrotic lumps on the body.

Post-mortem lesions:

Skin nodular lesions extending up to subcutaneous tissue and muscle with edema, congestion and hemorrhage. Lesions in the oral cavity and gastro-intestinal tract. Lumpy lesions in trachea and in respiratory tract including lung showing broncho-pneumonic changes.

Diagnosis

1. Based on clinical signs including pyrexia (up to 106⁰ F), presence of lumps on skin and mucus membrane all over the body of animal having size of 1- 5cm diameter, enlarged superficial lymph nodes, anorexia and sudden fall in milk yield.
2. Necrotic nodular lesions, crusted nodules with or without ulcers on the body of animal, depression and emaciation in chronic phase of disease.
3. Laboratory diagnosis by PCR, ELISA, Western blot technique, Virus neutralization test. Isolation and identification of virus from blood and skin biopsy.
4. Based on post-mortem examination lesions: Skin nodular lesions extending up to subcutaneous tissue and muscle with edema, congestion and hemorrhages.
5. Histo-pathology of skin biopsy: Epithelial cell degeneration, necrosis, intercellular and intracellular edema and intracytoplasmic inclusion bodies.

Samples of choice for diagnosis:

1. Blood sample : a) EDTA Blood sample b)Serum sample
2. Skin Biopsy : a) Skin Biopsy in saline b) Skin Biopsy in Formalin

Differential diagnosis:

Ring worm infection, insect bite, urticaria, cutaneous leucosis, Bovine Herpes mammilitis, skin form of Theileriosis, Bovine pseudo lumpy skin disease, photosensitization, and dermatophytosis.

Treatment:

There is no specific anti-viral therapy for lumpy skin disease. Anti-histamines and long acting non-steroidal anti-inflammatory agents @ calculated doses for 5 to 7 days. Systemic

antibiotic therapy to avoid secondary bacterial infection . Isolation of affected animal and supportive treatment should be given in early stage of disease to avoid the complications. During the recovery of the disease care should be taken for the myiasis due to fly strike from skin lesions. Vitamins and minerals supplementation including Zinc will help the early recovery from the disease.

Vaccination:

LSD Vaccine Neethling strain is used in endemic areas 2ml s/c annually. In India goat pox vaccine Uttarkashi strain recommended from scientists for vaccination and control of Lumpy skin disease in India, dose 2ml s/c route at neck area to healthy animals.

Control:

Isolation of affected animals from healthy animals and should not be allowed to graze in the natural pastures, symptomatic treatment should be given to the affected animals. Avoid insect bite to animals because insect bites acts as source of the virus from infected to healthy animals in short period of time span. Control of all vectors including mosquitoes should be done using fly repellants and other vector control measures in both affected and unaffected areas. Culling of severely affected animals to avoid the source of infection. Proper cleaning, sanitization and hygiene practices in the cattle shed should be followed including all bio-security measures to avoid the infection spreading from fomites. Vaccination should be done in healthy animals and annual vaccination should be followed in endemic area. Strict quarantine measures to be followed for animals as well as animal by products like hide from one country to another country. Proper disposal of carcass of animal should be done in suspected or confirmed from the disease. Avoid animal movement in endemic area; don't mix the animals from different herds. Closure of local cattle market, cattle shows and gathering cattle festivals to avoid the spreading of disease in endemic area. Separate needles should be used to each animal for treatment and vaccination because iatrogenic transmission is possible.