



## LUMPY SKIN DISEASE: AN OVERVIEW

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### Abstract

Lumpy skin disease is a Viral disease. Belongs to the family poxviridae. LSD Belongs to the Capri pox virus genus that include Goat pox virus And sheep pox virus . LSDV Widely Spread in water Buffalo And cattle. this disease cause Fever, Painful nodules on skin, And mucous membrane of animal. And due to this disease, huge economical loss in the livestock industry is occurring. LSD was first Identified in an outbreak in Zambia in 1929, Originally limited to Africa, since 2019 this disease was spread Through China and South East Asia. this review is designed to provide detailed information on different aspects of disease such as etiology,pathogenesis,classification, transmission ,diagnosis,different diagnosis,risk factors,treatment,prvention and control,economical impact.

Keywords – LSDV, capripox virus ,ticks, nodules.

### Introduction

lumpy skin disease is a viral infectious disease caused by lumpy skin disease virus (LSDV). caused by capri pox virus genus, family poxviridae that includes goat pox virus and sheep pox virus. This disease cause fever, painful nodules on skin, and mucous membrane This disease is also known by various names like “Neethling virus disease”, “knopvelsiekte”, “pseudo-urticaria”.(K.A.AL-Salihi 2014) This disease is widely spread in water Buffalo and cows, it is vector- borne disease transmitted by different biting and biting blood-sucking arthropods such as stable flies (Stomoxys, calcitrans), hard ticks (Rhipicephalus), mosquitoes (Aedes aegypti)(A.sprygin,A.V.Kononov.2019). LSDV cause mastitis, infertility, loss of milk production, mortality of up to 20% leads to economic loss of farmers. Until 1989, lumpy skin disease was limited to African continent but now this is moved outside Africa to Madagascar and Middle East and cause economical loss to the livestock industry. A diagnosis of LSDV was based on typical clinical patterns and confirmed diagnosis is based on transmission enzyme-linked immunosorbent assay (ELISA)(K.A.AL-Salihi,2014).



### Etiology and Epidemiology of LSD in cattle-

LSDV is related to sheep pox and goat pox virus, and it appears epidemically or sporadically. relatively, new foci infection appears in areas far removed from initial outbreak. Its occurrence is higher in wet summer weather, but it may occur in winter. Empirically, three species of hard ticks (*Rhipicephalus*) are found in Africa have been shown biologically transmit the virus (Paul Gibbs 2021) because the disease can be experimentally transmitted through infection saliva.

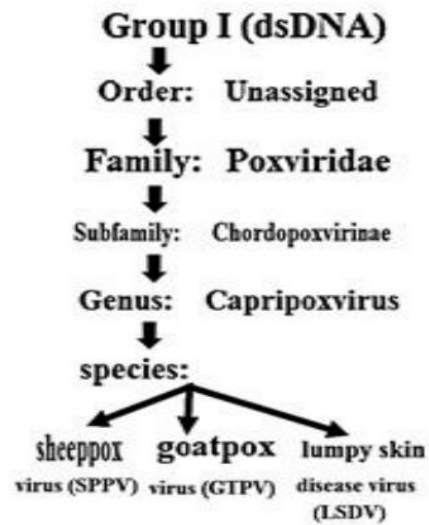
### Pathogenesis-

LSDV infection, virus replication, subcutaneous or intradermal inoculation of cattle with LSDV result in the development on the localized swelling at sit of inoculation after-

- 4-7 days post infection (DPI): swelling as 1-3cm nodules on sit of inoculation.
- 6-18 days post infection: viremia and shedding of virus via oral and Nasal discharge.
- 7 to 19 days post infection: lymphadenopathy generalized skin nodules.
- 42 days after fever: presence of viraemia

After recovery immunity from nature infection is lifelong in most of cattle, cow's antibodies are formed and repellent to clinical disease for about six months.

Classification-

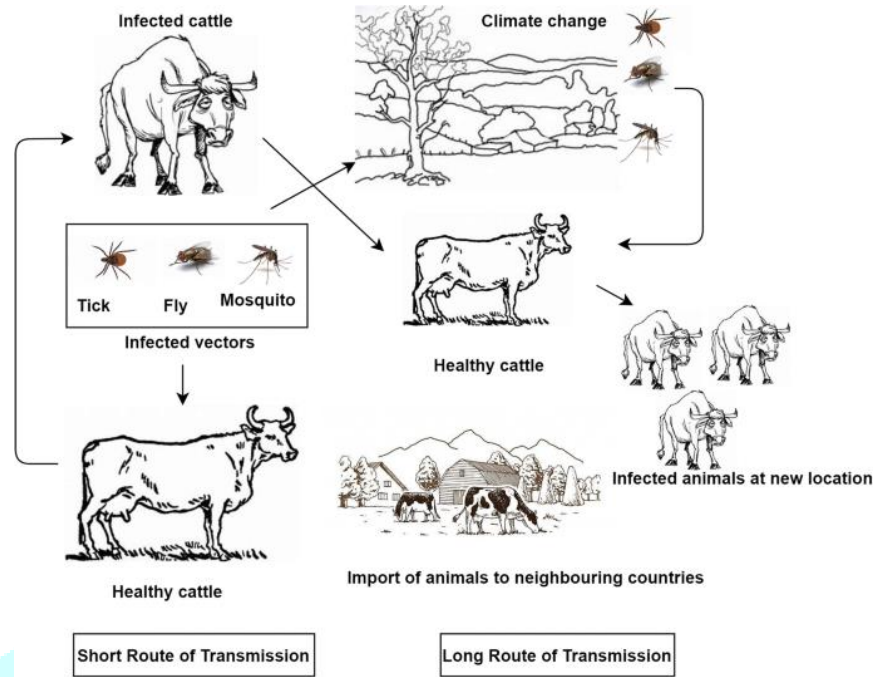


Transmission –

The prime route of spreading of disease transmission is through vector in most of native countries like Egypt and Ethiopia, the disease increases with the onset of seasonal summer and rainy season, with the peak activity of vector (Mulatu and Feyisa 2018). The disease decreases significantly in the winter season and reappears in the spring and summer.

The LSDV in the animal are transmitted through arthropods, blood sucking insect such as Rennie, Kitching and Mellor, while studies have suggested a possible role of hard tick in vials transmit. LSDV and viral antigen are found in saliva and different organs of ticks, including salivary glands and midgut in saliva. The mechanical transmission of virus is based on molecular evidence. the host does not explain rapid occurrence of extensive epidemics. hence, it seems that ticks may be acting as reservoirs for virus transmission in the later stage od disease, nasal section and semen, irons. The evidence of transmission of LSDV is scarce but research studies and field observation of Weiss 1968 concluded the low rate of transmission by direct route. on the other side studies consider that direct contact of animal has no role in transmission of blood and lachrymal secretion which form indirect source of infection for sharing of animal feeding and watering.

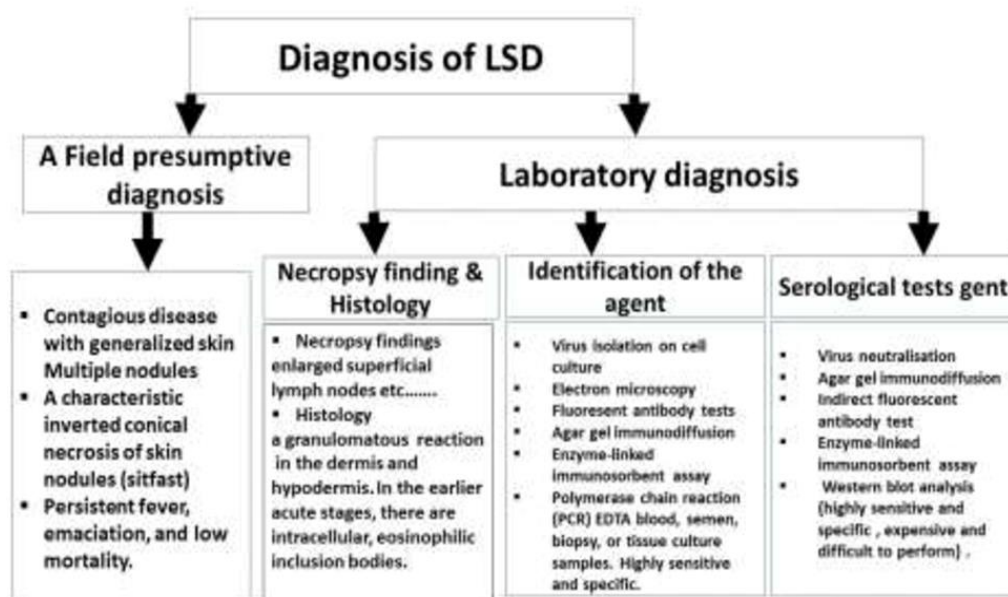
The LSDV it is assumed that transmission from infected mother to calf via milk secretion and skin abrasions (Tuppurainen et al.2017). the virus carryon virus in the semen for up to 42 days post infection (Irons et al.2005) and it has studied experimentally infection. iatrogenic route can be another route of transmission virus when any single needle used on skin of animal for mass vaccination that can acquired the viral from scabs or crusts of skin. (Mulatu and Feyisa 2018).



Diagnosis –

LSD diagnosis is done using PCR or real time PCR techniques. a real-time PCR(Orlova et al.2006) technique also established, differentiating among LSDV, sheep pox virus and goat pox viruses, polymorphism has also been used for the diagnosis purpose. Electron microscopy, virus isolation, virus neutralization and serological technique have been also used for LSDV for detecting as shown in table 1. It shows that molecular method is more precise and rapid compared with other methods. Among serological techniques, the virus neutralization test, which is slow and high specificity and low sensitivity is only valid and current test.

Table 1. Diagnostic process of LSD



### Different diagnosis-

There are many disease-causing similar signs and symptoms of LSD. It is very important to acquire a definite diagnosis to make sure the best preventative and control measures target the easy target herb

- Pseudo-lumpy skin disease
- Bovine herpes mammalities
- Dermatophilosis
- Onchocerciasis
- Insect bite allergies
- Stomatitis
- Hypoderm bovids infection
- Photosensitization.

### Risk factors-

- Mostly LSD can be spread in warm and humid climate, conditions with abundance of vector populations, such as after seasonal rains introduction of new animal to a herd.
- Both sexes as well as all ages and breeds can be affected by disease and also, risk factors can be associated with LSDV seropositivity include sex, age, management type, mean annual rainfall and water source.

### Treatment-

LSDV has no known cure or treatment, however antibiotic, anti-inflammatory drug or vitamins can be used in some cases to treat secondary bacterial infection or to reduce fever or inflammation and improve animal's appetite.

### Prevention and Control-

LSDV can be controlled by movement and quarantine control is not so effective because of biting flies and various certain tick species are most important in method of transmission of disease. Control of insect is not so effective in preventing LSD, but use of insecticide together with repellents can be aid in prevention of LSDV. LSDV outbreaks can be suppressed by quarantine, downfall of infected animal, disposal of carcasses, disinfecting and cleaning of premises and insect control.

LSDV can be controlled by immunoprophylactic. In endemic areas live vaccines help to control LSD. According to OIE four attenuated living strains of capri poxvirus have been used as vaccines for control of LSD. These are some strains of Kenyan sheep and goat pox virus passaged 18 times in lamb testis cells or fetal calf muscle cells, Romanian sheep pox strain and Yugoslavian RM 65 sheep pox strain, and LSDV from South Africa, passaged 60 times in lamb kidney cells and 20 times on chorioallantoic membrane of embryonated chicken eggs.

### Economic Impact-

The world organization for animal health (OIE) categorises the LSD is notified disease due to its economic impact .LSD is considered as agro-terrorism agent due to its ability to spread from africa to other places of the world (Tania Gupta and vanita Patil ,2020). Because of LSDV many countries are facing serious economic losses in affected countries. the disease cause reduction in milk yield (from 10% to 85%) due to secondary mastitis and high fever other consequences of this LSDV is to damage hides. decline of growth rate in cattle, and temporary or permanent infertility, abortion in animal and costs of treatment and vaccination, death of infection animals. in Ethiopia, the financial loss was 6.43 USD and 58 USD per head for Holstein Friesian and local zebu, respectively (Gari et al.2010).

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