Management of lumpy skin disease in Ongole (*Bos indicus*) calves at the Lam Farm in Guntur district of Andhra Pradesh

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ABSTRACT

The present study investigated the lumpy skin disease (LSD) in a closed herd of white cattle (breed Ongole) focusing on its incidence, clinical manifestations and management strategies. All animals above six months of age were immunized by administering 1 ml goat pox vaccine, S/C (Uttarakashi strain, VBRI, Hyderabad) two months prior to the occurrence of LSD in the herd. The overall incidence of the disease in the farm was recorded to be 8.15 per cent (331/27) and calves below one year were the most affected group. Mortality was observed especially in the calves below 5 months age group. Clinical symptoms comprised pyrexia, oedema of dependent parts, cutaneous nodules and/or respiratory distress. The absence of a definitive treatment calls for symptom-based strategies, including antibiotic administration and wound care. Overall, this study provided important insights of the dynamics of LSD and its effects on native Ongole breed calves.

Keywords: Lumpy skin disease; Ongole calves; clinical manifestation; management

INTRODUCTION

Lumpy skin disease (LSD) in cattle is caused by Neethling virus of the family poxviridae. It is a vector borne, non-zoonotic and transboundary disease which mainly affects cattle and water buffaloes and is associated with high morbidity but low mortality (Abutarbush et al 2015).

Biting flies, ticks and mosquitoes are among the arthropod vectors responsible for the disease transmission (Tuppurainen et al 2017). Noticeable symptoms include fever, indicating an active immune response, alongside visibly swollen superficial lymph nodes (Gupta et al 2020).

The hallmark changes in this viral disease lie in the emergence of numerous nodules, measuring 2-7 cm in diameter on both skin and mucous membrane. These nodules most commonly manifest the respiratory and gastrointestinal tracts, indicating a systemic impact that leads to decreased milk production and increased infertility rates in adult animals (Khan et al 2021). In addition, affected cattle experience oedematous swelling prominently in their limbs, engendering lameness and impaired mobility (Namazi and Tafti 2021).

As a result, it has an impact on the economic value of the animal since it impairs meat and milk output, hide quality, draught power and reproductive efficiency (Liang et al 2022). This intricate interplay of symptoms highlights how extensive the LSD virus is and how its consequences necessitate holistic management approaches to address both its outward and internal manifestations.

MATERIAL and METHODS

The present study was conducted at lam farm of Sri Venkateswara Veterinary University located in Guntur district of Andhra Pradesh from September 2023 to December 2023. In a closed herd of Ongole cattle with a strength of 331 animals, a total of 27 animals were affected with LSD (overall incidence of 8.15%) (Fig 1). All animals above 6 months of age were

immunized by administering 1 ml goat pox vaccine, S/C (Uttarakashi strain, VBRI, Hyderabad) 2 months prior to the occurrence of LSD in the herd.

RESULTS and DISCUSSION

The computation of incidence rates, considering both the recorded deaths and the entire population at risk within the defined age group, yielded an insightful result. Of the 27 animals affected, 10 were in the age group of 0-5 months (37.04%), 11 in 6-12 months age group (40.74%) and 6 in 1-2 years age group (22.22%) (Fig 2). Deaths were recorded only in the age group of 0-5 months with a mortality rate of 60 per cent (6/10) in this group affected with LSD. The incidence of LSD categorized by clinical manifestations is illustrated in Plate 1. The clinical manifestations of LSD were found to include pyrexia, oedema of dependent parts more frequently in the region of dewlap, chest and forelegs sometimes extending up to shoulder joints and nodules appearing on both the skin and internal mucosal surfaces. These clinical signs were frequently accompanied by respiratory distress (Plate 2). In the current context, a prominent pattern emerged where a significant number of cases exhibited a combination of nodules and pulmonary involvement.

In the current study, it's important to note that a definitive treatment tailored specifically for combating the disease was not presently available. Instead, the approach to manage the condition revolved around addressing its symptomatic manifestations. During the four-week course of treatment, the focus was to mitigate the impact of secondary bacterial infections, a facet that was effectively managed through the administration of broad-spectrum antibiotics such as enrofloxacin @ 5 mg per kg.bwt while concurrently providing comprehensive supportive care. To alleviate pain and discomfort, nonsteroidal anti-inflammatory drugs (NSAIDs) such as meloxicam @ 0.5 mg per kg.bwt were administered. To ensure optimal wound management, meticulous steps were undertaken including the utilization of povidone iodine solution for wound dressing. Additionally, the application of topical sprays such as topicure on the wounds served to expedite the healing process and enhanced overall recovery. Furthermore, a strategic regimen involving ivermectin was introduced into the treatment paradigm which was administered at a carefully calculated dosage of 0.2 mg per kg body weight via subcutaneous route. This therapeutic approach was followed as a weekly schedule. The primary goal of this regimen was to curtail the progression of the virus, consequently aiding in its suppression. This comprehensive approach to manage the disease underscores the multidimensional nature of the condition and the needs for a multifaceted strategy to address its diverse effects. After undergoing treatment, some of the calves exhibited scars on the body surface but recovered without experiencing any additional complications. However, six calves (4 males and 2 females), aged 0 to 5 months, died because of nodular and pulmonary involvement during the course of the treatment.

The findings of this study align with existing literature, emphasizes the vulnerability of younger animals to LSD infection. The high incidence rate among calves aged one year or younger underscores their susceptibility, likely attributed to developing immune system and limited exposure to pathogens (Smith 2014, Constable et al 2016). Notably, in the present study, the most pronounced mortality rate of 60 per cent within the 0-5 month's age group highlights the critical importance of this early phase in virus susceptibility and disease progression. However, Faris et al (2021) recently reported that cattle older than 1-2 years also had a greater incidence of LSD. The presence of nodules on both the skin and internal mucosal surfaces, often coupled with respiratory distress, portrays a complex disease profile. This diverse presentation potentially signifies diverse routes of transmission and emphasizes the intricate nature of the disease interactions with the host (Tuppurainen et al 2017, Namazi and Tafti 2021). The disease management underlines the lack of a specific LSD treatment. Instead, the adopted strategy focuses on dealing with symptomatic manifestations. The use of a four-week treatment programme in the present study, centered on preventing subsequent bacterial infections by antibiotic therapy and supportive care, demonstrates a proactive approach aimed at reducing complications (Gupta et al 2020). The incorporation of nonsteroidal anti-inflammatory drugs (NSAIDs) for pain management and the meticulous application of wound care measures involving povidone iodine solution, topical ointments and sprays underscore the holistic nature of the disease management strategy (Molla et al 2017). Furthermore, the inclusion of ivermectin, administered strategically at a calculated dosage, aims to impede virus progression and enhance its suppression, aligning with previous studies (Eom et al 2023). In the broader context, the comprehensive nature of the present approach mirrors the complex nature of

Plate 1. A cohort of LSD affected Ongole calves

Plate 2. LSD affected Ongole calf with severe respiratory distress

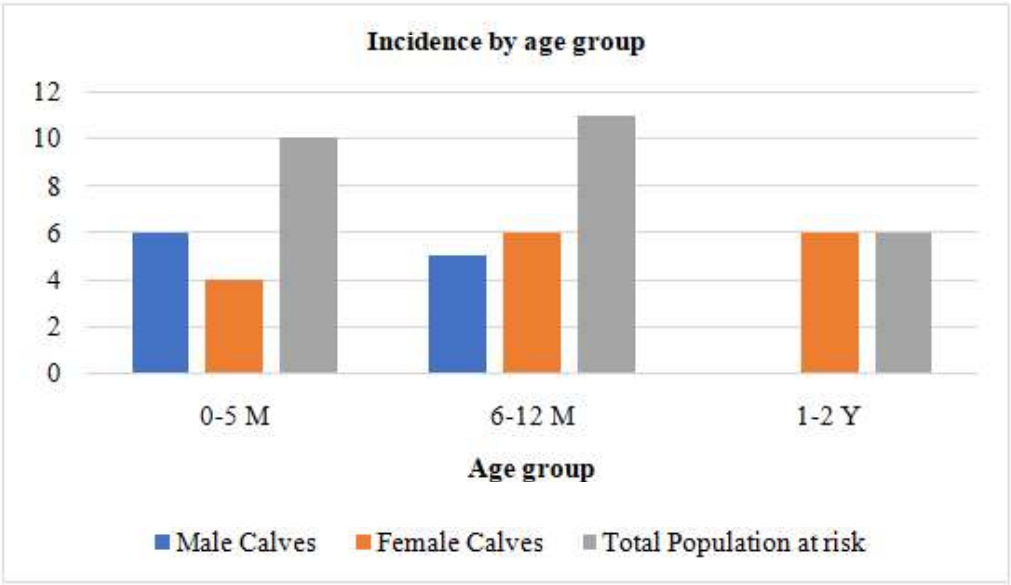

Fig 1. Incidence of LSD in different age groups

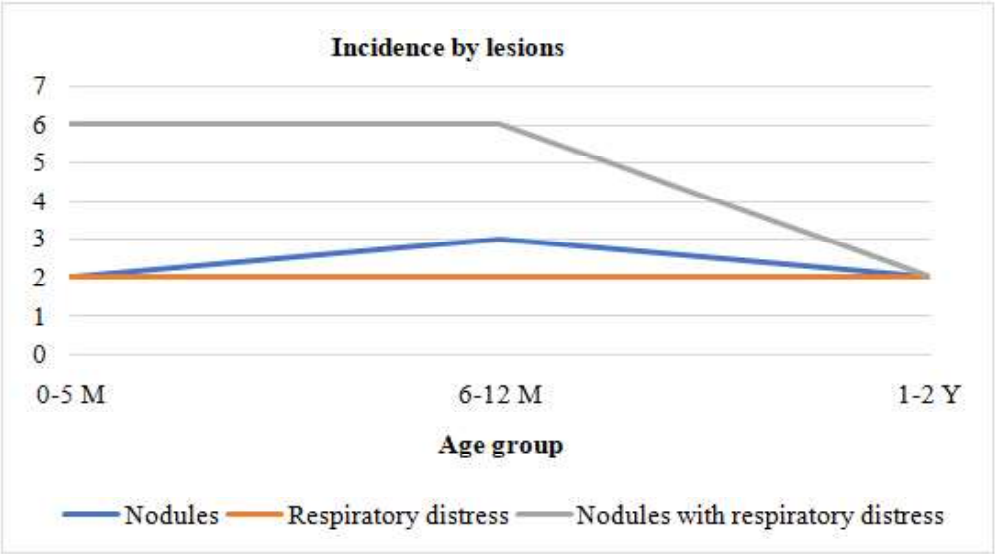

Fig 2. Incidence of LSD categorized by lesions

LSD. However, the unfortunate outcome of six calves succumbed to the disease, primarily due to nodular and pulmonary involvement, highlights the severity of LSD impact and the challenges in effective management.

Thus this study provides valuable insights into LSD in terms of incidence, clinical signs and management among Ongole calves. With an overall incidence of 8.15 per cent, higher prevalence and mortality among young calves below one year, it emphasizes the need for early detection and targeted prevention. The intricate relationship between clinical symptoms and disease progression highlights LSD complex effects. Treatment strategies offer a window into ongoing management efforts.

None of the animals in the herd beyond 2 years showed any clinical manifestations akin to LSD. Probably immunization of the herd (>6 months age) with goat pox vaccination 2 months prior to the occurrence of LSD might have provided cross protection but warrants further studies. This study contributes to the understanding of LSD and forms a basis for future research to dig into its mechanisms and develop more effective interventions.

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