

Case Report

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Lumpy Skin Disease in Pakistan: A Case Study of an Effective, Economic and largely available antiviral Azithromycin for Last Staged Cows



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Abstract

Lumpy skin disease is an epidemic viral disease. Sub-dermis injections of 10mg/ kg cattle body weight of Azithromycin (AZM) were tried for three consecutive days against two last staged cows infected with lumpy skin disease virus. The results were quick and fast, and the cattle started showing the positive effected on second post-treatment day and fully recovered afterdays. This study shows AZM is a potential cost effective (around PKRs 5,000 per animal) drug working against LSD. Further investigations are recommended.

Keywords: Lumpy skin disease; azithromycin; orthopoxvirus; Veterinary

Introduction

Lumpy skin disease (LSD) is an epidemic viral disease of cattle. LSD originated from Africa in 1970 and via Middle East in 2000[1] it reached Asia [2] in 2013. In 2021 it reached Eastern Europe. Its main signs and symptoms are watery eyes, higher body temperature, abnormal salivation, along with hard swollen nodules that are up to 5 cm in diameter throughout the body. The tip of the nodule turns hard and dry like a wound which invites secondary infection. Prevalence is the highest in the rainy season. Body fluids, through the surface water are a main cause of its spread; however, biting insects like ticks, flies [3] and mosquitoes [4] also spread this disease. Water buffaloes act like maintenance hosts without getting infected. An infection by bovine herpes virus (BHV2) also causes similar symptoms and is sometimes confused with LSD. In fact, BHV2 is a pseudo-LSD, and a milder disease. India reported death of some 35,000 cattle in the neighboring states of Pakistan. However, data is not available for Pakistan. Since LSD is viral disease, and hence diagnosed by histopathology, virus isolation or PCR.

The genus capripoxvirus (CaPvs), main cause of LSD [5], belongs to the subfamily Chordopoxvirinae of family Poxviridae. Three viruses, i.e., goat pox virus (GTPV), sheep pox virus (SPPV) and cattle lumpy skin disease virus (LSDV). Cops have a brick shaped protein coat enveloping a double stranded DNA (150

kbps). LSDV is the largest virus in this family and is anti-genetically closely related with the two other viruses in this family. This makes serological identification difficult and is not morphologically distinguishable from orthopoxvirus. World Organization for Animal Health OIE categorized all CaPVs as notifiable diseases [6].

Case Presentation

A livestock mix farm, having of 60 animals, is maintained at Balkasar (District Chakwal, Punjab, Pakistan, N 32° 55' 49.0008", E 72° 51' 20.0016"). All cattle (Dhani mix, Sahiwal mix, and other mix breed) were, though vaccinated against LSDV, yet in some animals LSDV infection was diagnosed by Veterinary officer July 2022, and disease was spread among all cattle.

Two female cattle were severely infected with LSDV showing some 20% weight loss. The body was covered with lesions, were off fed and there was no hope for their survival. This was the time when we started planning to administrate synthetic macrolide antibiotic [7] having broad range of mycobacterial, bacterial, anti-inflammatory, and antiviral properties. Azithromycin (AZM) is reported to lower replication rate of a broad range of viruses, including rhinovirus, influenza virus, ebola virus, Zika virus, enteroviruses, and corona viruses, by influencing enhanced expression of antiviral pattern recognition receptors and

induction of antiviral type 1, and type3 interferon, resources [8-10]. LSDV causes profuse inflammation and AZM is reported to suppress IL-1 Beta, IL-2, TNF and GM-CSF and inhibits T-cells by inhibiting calcineurine signaling [11]. AZM targets granulocytes in lysosomes and affects accumulation, degranulation, adhesion, and apoptosis in neutrophils.

Investigation and outcome

We preferred azithromycin available in local market Used in human medicine to administrate two seriously infected cows. Since these cows off-feed, we preferred subcutaneous injectable preparations (10mg per kg body weight of the cow) given for 3 consecutive days. After the second day, both cows started showing significant improvement. Water from eyes, and abnormal salivation turned normal. They started showing normal activities and after 2 days of completion of the doses, the lumps started depleting and the animal turned fully active.

Conclusion

Since AZM is being widely used in human medicines and is an FDA and WHO approved medicine [12,13], therefore it should be safe for animals too. Treating one animal using the present regimen costs around PKRs 5,000, should be economical keeping to the price of a dying cow and is also affordable. The drug is easily available in Pakistan with pharmacists. We also recommend fellow scientists to conduct further confirmatory studies with a larger sample size. The cost of the proposed treatment can be lowered with the introduction of medicine with veterinary standards.

Conflict of Interest

Authors declare no conflict of interests for this article.

Ethics Statement

This material is the author's own original work, which has not been previously published elsewhere, the paper is not currently being considered for publication elsewhere, the paper reflects the authors' own research and analysis in a truthful and complete manner. No Animal welfare guidelines violated.

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Author Contribution

Being the owner of this farm, I was the only one who designed and am now reporting on this case study.

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