

# An Overview on Enzootic Bovine Leukosis

Yasuo Chaudhury\*

Department of Medicine, Osmania University, Hyderabad, Telangana, India

## Introduction

Enzootic bovine leukosis is caused by a Retroviridae virus. The Bovine Leukaemia Virus (BLV) is a disease that affects cattle and water buffaloes. Infected calves have persistent lymphocytosis as a result of an increase in the number of circulating B lymphocytes, and 1-5 percent develops Bcell lymphosarcoma. BLV resembles the human T cell leukaemia virus in terms of genetics, pathogenicity, and sequencing (HTLV-1 and HTLV-2). Infected cattle demonstrate digestive difficulties, lack of appetite, weight loss, weakness or general debility, neurological symptoms, and enlargement of superficial lymph nodes on palpation and rectal examination. The abomasum, right auricle of the heart, spleen, intestine, liver, kidney, omasum, lung, and uterus are all involved in bovine leukosis. The genetic makeup of cattle has an impact on the development of lymphosarcoma and tumours.

## Description

BLV is more prevalent in Australia, North America, Africa, and Asia. When cultured in vitro, virus can be detected in peripheral blood mononuclear cells (PBMC). The DNA of the infected cell is integrated by the virus as a provirus. The presence of virus was also discovered in natural body fluids (saliva, milk, nasal, and bronchial fluid). The virus spreads naturally through the transmission of virus-infected cells. Artificial transmission of BLV is caused via blood-contaminated needles, surgical equipment, and rectal examination gloves, among other things. Blood sucking insects, particularly tabanids, can potentially transfer the virus mechanically. PCR, virus inoculation, and serological tests are among the diagnostic procedures used to detect virus. Sheep are more vulnerable to experimental inoculation and develop tumours at a younger age than cattle. A sustained antibody response can be established after experimental infection in deer, rabbits, rats, guinea pigs, cats, dogs, sheep, rhesus monkeys, chimps, antelopes, pigs, goats, and buffaloes [1-3].

Virus transmission was caused by the global trade of animal goods. BLV eradication programmes have been launched in a number of European nations. Belgium, Ireland, and Norway have already wiped off the virus, and other countries are close behind. In Albania, Bulgaria, Yugoslavia, and Poland, however, the infection is enzootic. The enzootic bovine leukosis has wreaked havoc on America, Australia, and Canada. The BLV affects a large percentage of meat herds and dairy animals in the United States. Infectious disease is prevalent in several South African countries. As a result, BLV infection has spread throughout the world. Because to prophylaxes procedures centred on eliminating diseased animals from the herd, the infection rate in Western Europe has dropped dramatically.

Bovine leukosis virus is an exogenous RNA retrovirus that causes enzootic bovine leukosis, the most frequent cancer-causing disease in cattle worldwide. It belongs to the Retroviridae family, orthoretrovirinae subfamily,

\*Address for Correspondence: Yasuo Chaudhury, Department of Medicine, Osmania University, Hyderabad, Telangana, India, E-mail: [chaudyasu@gmail.com](mailto:chaudyasu@gmail.com)

Copyright: © 2022 Chaudhury Y. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: 07 April, 2022, Manuscript No. jidm-22-66724; Editor assigned: 12 April, 2022, PreQC No. P-66724, Reviewed: 15 April, 2022, QC No. Q-66724; Revised: 21 April, 2022, Manuscript No. R-66724, Published: 29 April, 2022, DOI: 10.37421/2576-1420.2022.7.231

and Deltaretrovirus genus. In cattle, BLV induces a chronic and persistent infection that has a negative impact on the population of B-lymphocytes. Cattle become infected after being exposed to infected bovine blood cellular components, infected cultured cells, or free virus particles produced in cell culture. Immunocytochemistry can only identify viremia in the first and marzin lymph nodes. After 2-8 weeks after inoculation, the cattle develop a serological reaction against capsid and envelope proteins. The 70 percent of BLV-infected mice showed an increase in B/T cells after many years of infection.

Chronic lymphocytosis affects half of the animals in 70% of cases. The polyclonal proliferation of mature lymphocytes results in an increase in lymphocyte population, and cytology and cryptology reveal that the cells are normal. The lymphocytes CD5, CD11b, and CD11c are the ones that are affected by the infection. Multicentric lymphosarcoma is a rare manifestation of BLV infection that occurs after 1-8 years of infection in 1-5 percent of afflicted animals. Persistent lymphocytosis affects about two-thirds of animals with tumours. Viruses spread through two different mechanisms. The virion's interaction with the lymphocyte leads to the introduction of viral single-stranded RNA, reverse transcription of the genome, and finally integration of the viral genome with the host genome, resulting in the formation of provirus. The infectious cycle is the name given to this phenomenon. Tax, a virus regulatory protein that controls cellular growth, is involved in the second stage of virus replication [4].

Animals with BLV infection develop lymphosarcoma. The infected animal becomes emaciated, loses appetite, and produces less, yet there is no fever, and the internal and external lymph nodes grow. Peripheral lymph nodes enlarge in 75-90 percent of patients. The rupture of the spleen causes sudden death. Arrhythmia, heart murmur, blindness, paresis, paralysis, indigestion, ulcers, peritonitis, hematuria, hydronephrosis, and intra-abdominal haemorrhage are some of the other symptoms.

For the diagnosis of enzootic bovine leukosis, various approaches have been developed. Clinical indicators such as lymphosarcoma and enlarged lymph nodes can be used to diagnose the infection. Agar gel immunodiffusion (AGID), passive hemagglutination assay (PHA), enzyme-linked immunosorbent assay (ELISA), and radio immunoassay (RIA) are all common serological procedures used around the world. For the detection of infection, a variety of PCR approaches have been used, including nested PCR, real-time PCR, and direct blood-based PCR. Western blotting for viral proteins, syncytium formation test, and indirect immunofluorescent assay for BLV antigen detection are some of the other approaches that can be employed for detection [5,6]

## Conclusion

BLV is the causative agent of enzootic bovine leukosis, which is a neoplastic disease of cattle, buffalo and cypabaras and cause severe economic losses to the dairy and meat industry worldwide. This disease result into B cell lymphosarcoma and persistent lymphocytosis in the uninfected animal. Prevalence of virus is more in America and European countries so preventive measures should be taken to check the transmission of BLV. Vaccination against the EBL is under trail. For reducing the incidence of EBL in the herd, different diagnostics approaches should be developing. Development of therapeutics against the disease is the area where more emphasis should be laid.

## References

1. Ardolino, Michele, and David H. Raulat. "Cytokine therapy restores antitumor

- responses of NK cells rendered anergic in MHC I-deficient tumors." *Oncoimmunol* 5 (2016): e1002725.
2. Armstrong-James, Darius, Gordon D. Brown, Mihai G. Netea and Teresa Zelante, et al. "Immunotherapeutic approaches to treatment of fungal diseases." *Lancet Infect Dis* 17(2017): e393-e402.
  3. Ashorn, Per, George Englund, Malcolm A. Martin, and Edward A. Berger, et al. "Anti-HIV activity of CD4-Pseudomonas exotoxin on infected primary human lymphocytes and monocyte/macrophages." *J Infect Dis* 163(1991): 703-709.
  4. Babior, Bernard M., Cindy Takeuchi, Julie Ruedi and Paul Wentworth et al. "Investigating antibody-catalyzed ozone generation by human neutrophils." *Proc Natl Acad Sci USA* 100 (2003): 3031-3034.
  5. Baer, Mark, Teiji Sawa, Peter Flynn and Kenneth Luehrsens, et al. "An engineered human antibody fab fragment specific for Pseudomonas aeruginosa PcrV antigen has potent antibacterial activity." *Infect Immun* 77 (2009): 1083-1090.
  6. Bagley, Stephen J., Arati S. Desai, Gerald P. Linette and Donald M. O'Rourke, et al. "CAR T-cell therapy for glioblastoma: Recent clinical advances and future challenges." *Neuro Oncol* 20 (2018): 1429-1438.

**How to cite this article:** Chaudhury, Yasuo. "An Overview on Enzootic Bovine Leukosis." *J Infect Dis Med* 7 (2022): 231.