

ENZOOTIC BOVINE LEUKOSIS - A CLINIC CASE IN AN OLDER DAIRY COW

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Enzootic bovine leukosis (EBL) is a highly fatal, systemic, malignant neoplasia of the reticuloendothelial system of cattle, caused by the bovine leukemia virus, a C type retrovirus, and characterised by the development of aggregations of neoplastic lymphocytes in almost any organ, with a corresponding variety of clinical signs. Several forms of this disease are known (Radostis and al, 2000).

In Slovenia between 0.28 and 29.11 % of animals were infected on some farms before the disease had been eradicated. The disease was eradicated in 1987. After that year regular annual controls all over the country have been carried out in accordance to the Direction on Implementation the Prevention of Measurements to Discover and Prevent Infectious Diseases (Klinkon, 1998: Klinkon et al, 2002). In Slovenia epizootic conditions are normal as regard the EGL.

Case history

A serum that reacted to the presence of antibodies against the virus of enzootic bovine leukosis was found during regular annual inspection. Epizootic search showed that the sample derived from a cow from a smaller extensive system of production. Before the animal was slaughtered it had been clinically checked, samples of blood were taken from V. Jugularis for serological, haematological and biochemical examinations, as well as samples of milk. For serological diagnosis of blood serum and tissue fluids the AGID test with antigen, the control positive serum and agar produced by Ag Marburg were used. The milk sample underwent a serological examination with Bommely Chekit leucotest milk monophasic and bephasic. Haematological examinations were done by ABC Vet electronic counter, blood smears were coloured according to the modified method of Papanheim. Bioanalyzer Cobas Mira was used to do biochemical tests. After the slaughter patho-anatomic section was carried out taking material for histological tests.

Necropsy was done and material for histological examination was taken. Tissues were fixed in 10% neutral formalin solution. Paraffin sections were stained with hematoxylin and eosin (HE) and toluidine blue.

The described dairy cow was of Grey-and-Brown breed, 15 years old, some days after calving and in very bad condition - BCS-1 (Brand et al, 1996), it was sad and weighted 190 kg.

The clinical examination revealed that the cow had a body temperature of 38.5 °C, heart rate of 72 beats/min, respiratory rate of 24 breaths/min and 6-wick rumen cobcentrations/5min.

Antibodies against the virus EGL were found in blood serum, in tissue fluids of lungs and in milk.

Haematological tests showed hypochromium anaemia; (RBC = $4,5 \times 10^{12}/L$, haemoglobin = 83 g/L, haematocyte = 0,248 L/L, thrombocytes = 338, MCH = 18,4 pg, MCHC = 334 g/L), leukocytosis (WBC = $22,8 \times 10^9/L$) with neutrophilia (neutrophil granulocytes = 58 %, ...neutrophil granulocytes = 31 %) and lymphopenia (lymphocytes = 3, lymphoblasts = 4). Results of haematological examination showed that the animal was extremely exhausted and that the organism had already reacted to post partum events.

Several biochemical examinations of blood serum were carried out.

Some of the biochemical parameters in the blood serum were normal: cholesterol - 2.41 mmol/L, triglycerides – 0.30 mmol/L, urea – 2.36 mmol/L, sodium - 137 mmol/L, potassium – 5.13 mmol/L, chloride – 101 mmol/L; ALT –7 U/L, AST – 79 U/L; some of them were high, like bilirubin – 28.73 μ mol/L, glucose – 4.11 mmol/L, LDH – 1526 U/L, CK – 130 U/L, ALP – 52 U/L; some of biochemical parameters in the blood serum were low: iron – 20,8 μ mol/L, magnesium – 0.66 mmol/L, phosphorus – 1,11 mmol/L, calcium – 1.69 mmol/L, total proteins – 64,7 g/L, albumin – 23,0 g/L, creatinine – 46 μ mol/L .

The results point to the conclusion that the organism of the studied dairy cow was highly stricken and exhausted due to a long lasting chronic disease (enzootic bovine leukosis, anaemia) or to partum (stress, damages of liver parenchymal and voluntary muscles, mineral shortage).

At the necropsy high level of cachexia and dehydration were observed. Subcutaneous regional lymph nodes were normal. The spleen was slightly enlarged. The liver and the kidney were yellowish in colour. In the lung chronic interstitial pleuropneumonia and fibrinopurulent bronchitis were detected. The heart was bilateral dilated. The fore stomachs lymph nodes were moderate enlarged. The mucosal surface of abomasum was covered with numerous white noduli up to 5 mm in diameter. In the surface of noduli the erosions were seen. Low level catarrhal enteritis was confirmed in the small intestines. The Peyer patches and solitary lymph follicles in the intestinal wall were enlarged. The uterus was not completely involved according to the time post parturition. In the udder tissue only traces of milk were established

Pathohistology examination showed the huge enlargement of lymphatic tissue in the abomasal mucosa and submucosa. Lymphoblastic cells were moderate in size with large round nuclei with dispersed chromatin. In the spleen follicular and reticular hyperplasia were seen, lymphoblastic cells were diffusely spread. In the Peyer patches and ruminal lymph nodes the diffuse lymphoblastic hyperplasia and focal follicular lymphocytolysis were seen. Lymphoblastic cells were detected in the vessels in the liver and in the kidney.

Summary

- Dairy cow is 15 years old and very exhausted (BCS-1)
- Antibodies against the virus EBL were serologically defined in blood and milk serum and in tissue juice of lungs.
- Hypochromic anaemia is the result of chronic enzootic bovine leukosis.
- Macroscopically and histologically elevated quantity and immaturity lymphatic tissue in the mucosa and submucosa of the abomasum confirm gastro intestinal form of EGL
- Pathological changes on the spleen, lymph nodes, fore stomachs and lymphatic tissue in the wall of the intestines are due to chronical course of leucosis of alimentary tract.

References

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