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Acute lymphoid leukaemia in a Labrador dog: A case report

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Abstract

Acute lymphocytic leukemia was diagnosed in a dog that was presented with lethargy, depression and pale mucus membrane. The case was diagnosed on the basis of hematology which revealed leukemoid response with a large number of bizarre shaped lymphocytes (98%), anemia and thrombocytopenia. The animal was treated with vincristine (0.5 mg/m^2), prednisolone and other symptomatic therapy, but dog succumbed to the disease within a week.

Key words: Acute Lymphoid Leukaemia, Diagnosis, Dog, Lymphocytes

Lymphoid leukaemia is malignant neoplasm of the lymphocytes originating primarily in the bone marrow. It includes both acute and chronic lymphoblastic leukaemia which is uncommon, therefore, can be difficult to diagnose. Acute lymphoblastic leukaemia arises from the malignant transformation of lymphoid progenitors in bone marrow, which results in myelophthisis and subsequent invasion of peripheral tissues. Clinical signs are typically acute in onset, caused by the infiltrative and functional effects of the expanding burden of malignant cells, and are most commonly a consequence of disrupted hematopoiesis (Bennet *et al.,* 2017). This case report presents diagnosis and prognosis of acute lymphoid leukaemia in a dog.

Case History and Clinical Observations

A five and half year old Labrador dog was presented to the Small Animal Clinics of Teaching Veterinary Hospital of Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, with the history of lethargy, inappetance, fever and polyuria for last 10 days. Physical examination revealed depression, pale mucus membrane, normal rectal temperature, respiration and heart rate and normal superficial lymph nodes. A solid mass was felt on abdominal palpation. Hematology revealed anemia (Haemoglobin- 07 gm%), low platelet count and leukemoid response (Fig. 1) with a large number of bizzare lymphocytes (Total Leucocyte Count-1,45,000/ul, DLC:- Neutrophils- 02%, Lymphocytes- 98%) confirming the diagnosis of Acute Lymphocytic Leukemia. Blood biochemistry showed elevated AKP (525 U/L) and Globulin (4.7 g/dl). Lateral Thoracic radiography showed mild to moderate miliary interstitial pattern in lung. Heterogenous echotexture of spleen with a nodule protruding from its parenchyma was seen in abdominal ultrasonography (Fig.2 and 3). Dog was treated with Vincristine (0.5mg/m^3) i/v once, Prednisolone @ 2mg/kg bid (i/m), Cefataxime @ 25mg/kg, bid (i/m), Enrofloxacin@ 5mg/kg, bid (i/m) and Metronidazole @ 10mg/kg, bid(i/v), B Complex @ 2ml, od (i/m); but dog succumbed to the disease within 1 week.

Acute Lymphoid Leukemia (ALL) is a dangerous, rapidly progressive cancer that most often affects young and middle age dogs. Most animals with leukemia present with vague, non-specific clinical signs (lethargy, weakness, inappetence and weight loss). These are attributable to the consequences of the disease process viz., cytopenia, and metabolic or paraneoplastic complications (Dobson *et al*., 2006). In ALL, the early blast cells proliferate in the bone marrow at the expense of normal haematopoiesis, resulting in varying degrees of anaemia, thrombocytopenia and neutropenia and blast cells also spill over into the blood and infiltrate peripheral organs, especially the liver and spleen (Chowdary *et al*., 2015). Similar findings were also seen in the present case.

Routine haematological assessment of a patient usually provides the first indication of leukaemia. The most common and striking hematologic abnormality is an altered total leukocyte count which may range from low (i.e., <4,000/µl) to very high (i.e., >100,000/µl). Leukocytosis in ALL patients is usually due to the presence of neoplastic lymphocytes (pleiomorphic lymphocytes with heterogeneous chromatin pattern and prominent nucleoli) in the circulation. (Cuto, 2003).

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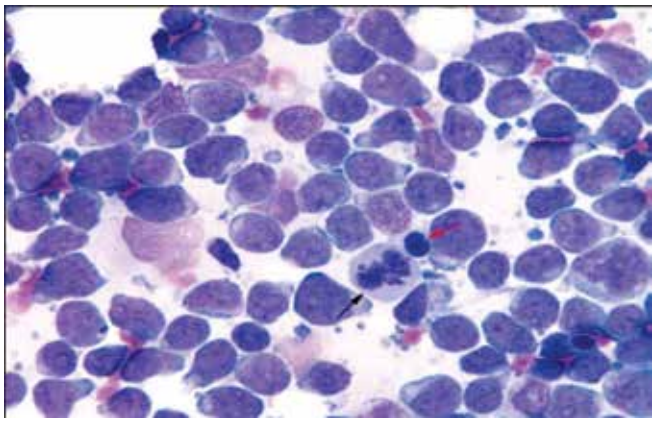

Fig 1. Blood smear showing leukemoid response with a large number of bizzare lymphocytes

Fig 2. Ultrasonogram showing a nodule protruding from splenic parenchyma

Fig 3. Ultrasonogram showing heterogenous echotexture of spleen

ALL must be differentially diagnosed from Lymphoma, characterized by severe lymphadenopathy which is not a finding in the present case. A pronounced lymphocytosis with circulating neoplastic cells on the complete blood count is more consistent with lymphocytic leukemia, unless it is stage V lymphoma. Though bone marrow biopsy is a confirmatory test for leukemia, but in present case, the extreme hematological findings and cytology are clear evidences of bone marrow myelopthesis due to leukemia (Raskin *et al.,* 1999).

Treatment of ALL is often unrewarding, and remission can be difficult to achieve. A combination of vincristine and prednisone is the foundation of induction therapy for ALL and was the most successful protocol in a study of 30 dogs with ALL (Cuto, 2003). This combination uses vincristine administered at 0.5 to 0.7 mg/m^3 IV once weekly with prednisolone given concurrently at 40 to 50 mg/m^3 PO once daily for 1 week and then slowly tapered until remission occurs along with supportive therapy such as administration of broad-spectrum antibiotics to prevent sepsis, intravenous fluids to correct dehydration and nutritional support. In present case, death of dog might have resulted from failure to induce remission, organ failure from neoplastic infiltration, or sepsis associated with pre-existing and/or chemotherapy-induced cytopenias.

Thus, it can be concluded that the prognosis of ALL is grave due to very rapid course of disease with an abnormal increase of immature lymphocytes hindering the production of other blood cells, posing an immediate threat to the patient's life.

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