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VVV Amruth Kumar
Assistant Professor, Veterinary Clinical Complex, C.V.Sc, Korutla, Jagtial Dist, Pvnr Telangana Veterinary University, Hyderabad, India

K Nalini Kumari
Associate Dean, C.V.Sc, S.V.V.U, Tirupati, India

K Satish Kumar
Professor and University Head of Medicine, Principal, Veterinary Polytechnic College, Mamnoor, Warangal Dist
Pvnr Tvu, Hyderabad, India

V Gireesh Kumar
Associate Professor, Dept of Surgery, C.V.Sc, Rajendranagar, Pvnr Tvu, Hyderabad, India

M Lakshman
Professor, Dept of Pathology, Ruska Lab, C.V.Sc, Rajendranagar, Pvnr Tvu, Hyderabad, India

Correspondence
VVV Amruth Kumar
Assistant Professor, Veterinary Clinical Complex, C.V.Sc, Korutla, Jagtial Dist, Pvnr Telangana Veterinary University, Hyderabad, India

Hemato-biochemical changes in perianal tumors affected dogs

VVV Amruth Kumar, K Nalini Kumari, K Satish Kumar, V Gireesh Kumar and M Lakshman

Abstract
The objective of the present study was to evaluate and compare the hematobiochemical parameters of the dogs suffering with Perianal tumors with the hematobiochemical parameters of the apparently healthy dogs. Dogs which were presented to the Veterinary Clinical Complex were screened for the presence of tumors. They were subjected to various diagnostic tests to confirm the tumor types. Upon confirmation of tumor their hematobiochemical parameters were studied. The dogs which were presented at the hospital for regular checkups and vaccination were randomly selected and their hemato biochemical parameters were obtained which were grouped as apparently healthy dogs. The hematobiochemical parameters of dogs which were diagnosed for perianal tumors were compared with the parameters of the apparently healthy dogs.

Keywords: Dogs, hematology, perianal tumors, serum biochemistry

Introduction
Cancer is one of the major causes of death in human beings and dogs. Neoplasms are of two types benign and malignant. Leukemias and lymphoma which account for approximately 8% of malignancies arise from the blood forming cells and from cells of the immune system. Despite the availability of wide range of diagnostic modalities for cancer no single modality is full proof for identification of cancer. Laboratory assessment for cancer with fine needle aspiration, histopathology etc is the main source of reliable diagnosis. Ultrasonography, radiography hemato biochemistry etc may be used for further confirmation of cancer and metastatic growths in the body [1, 3].

Materials and Methods
The dogs presented to clinic and those referred from various hospitals in and around Hyderabad to Teaching Veterinary Clinical Complex, Bhoiguda formed the basis for the present study. Whole blood and serum samples of all the selected dogs formed the clinical material for laboratory examination. Clinical samples for hematology and biochemistry i.e., blood and sera samples were collected from all the dogs with malignancy for laboratory examination. In dogs with malignancy, blood and sera samples were collected before therapy. Blood and serum were also collected from apparently healthy dogs to establish normal values. Two ml of whole blood was withdrawn from cephalic or saphenous vein in vacutainer with K-EDTA for estimation of hematological parameters. For separation of serum, 5ml of blood was collected in a vacutainer containing clot accelerator. Serum was separated immediately after clotting by centrifugation at 3000 rpm for 5 minutes and collected in ependorff tubes. Care was taken during collection and processing of blood samples to avoid haemolysis. Serum samples were collected for the estimation of biochemical parameters. Estimation of all the hematological and biochemical parameters was carried out on the same day of collection. However, blood was also collected from apparently healthy dogs to establish normal values.

Hematology
Hematological parameters such as Hb, PCV, TEC, TLC and DLC were estimated as per the standard procedures. Hemoglobin was estimated by Sahli's comparator method and the concentration was expressed as g/d1. Packed cell volume was estimated by microhematocrit method and values were expressed as per cent. Total erythrocyte count was examined by haemocytometer and the results were expressed as number of erythrocytes x 10^6 per microliter

Of blood. Total leucocyte count was examined by haemocytometer and the results were expressed as number of leucocytes x10^3 per microliter of blood. Blood smears were prepared on a clean grease free slide and stained by Leishman's stain for DLC. Cells were counted by battlement method and expressed as percentage.

Serum biochemistry

All the serum biochemical parameters were estimated by semi auto analyzer (Star 21 plus, supplied by M/s Rapid Diagnostics, New Delhi) employing the kits supplied by Span diagnostics Pvt. Ltd.

Alanine aminotransferase (ALT)

Serum ALT was estimated by kinetic assay method and the values were expressed as IU/L.

Aspartate Aminotransferase (AST)

Serum AST was estimated by kinetic assay method and the values were expressed as IU/L.

Alkaline phosphatase (ALP)

Serum ALP was estimated by kinetic assay method and the values were expressed as IU/L.

Total Protein

Total Protein was estimated by end point method (Modified Biuret) and the values were expressed as g/dl.

BUN

BUN was estimated by initial rate assay (NED-dye) and the values were expressed in mg/dl.

Creatinine

Creatinine was estimated by initial rate assay (Modified Jaffe's reaction) and the values were expressed in mg/dl.

Results

Hematology

In the present study, dogs affected with perianal tumours revealed an insignificant decrease of mean haemoglobin (12.96±0.74 g/dl), PCV (39.01±0.02 percent) and TEC (6.49±0.16 x106/µl) was noticed when compared to that of apparently healthy dogs (13.75±0.51g/dl, 41.60±0.91 percent and 6.63±0.3 x106/µl) respectively. The leukogram of perianal carcinoma cases revealed a mild leucocytosis (16.99±0.44x103/µl) (P<0.05) and insignificant neutrophilia (74.53±0.22 percent); insignificant lymphocytopenia (20.55±0.82 percent) and normal monocytes as well as eosinophils (2.36±0.65 percent and 2.57±0.89 percent), when compared to that of apparently healthy dogs (13.30±0.86 x103/µl, 72.0±0.32 percent, 24±0.14 percent, 2.00±0.36 percent and 2.00 ±0.80 percent) respectively. Similarly, an insignificant increase was noticed with respect to platelet levels (3.11±0.91 x105/dl) when compared to that of apparently healthy ones (3.06±0.24 x105/dl). (Table No 1).

Table 1: Mean Hematology values of dogs with Perianal tumors and Apparently Healthy dogs

S. No.	Parameter	Apparently Healthy dogs (n=10)	Dogs affected with perianal tumors (n=20)
1	Haemoglobin (g/dl)	13.75±0.51	12.96 ±0.74
2	PCV %	41.60±0.91	39.01 ±0.02
3	TEC (x 10^6/ µl)	6.63±0.3	6.49 ±0.16
4	TLC (x 10^3/ µl)	13.30±0.86	16.99±0.44**
5	DLC (%)		
	Neutrophils (%)	72.0±0.42	74.53 ±0.22*
	Lymphocytes (%)	24.0±0.14	20.55 ±0.82*
	Monocytes (%)	2.00±0.36	2.36 ±0.65
	Eosinophils (%)	2.00±0.80	2.57 ±0.89
6	Platelets (x 10^5/dl)	3.06±0.24	3.11±0.91

**: Significant at P<0.01 when compared to apparently healthy dogs; *: Significant at P<0.05 when compared to apparently healthy dogs

##: Significant at P<0.01 when compared to before therapy; #: Significant at P<0.05 when compared to before therapy

Serum Biochemistry

Serum biochemical estimations in dogs with perianal tumours revealed an insignificant increase in BUN, serum creatinine, ALT, AST, ALP and total protein as depicted in Table No. 2.

Table 2: Mean serum biochemistry values of dogs with perianal tumors and Apparently Healthy dogs

S. No.	Parameter	Apparently Healthy dogs (n=10)	Dogs affected with perianal tumors(n=20)
1	BUN(mg/dl)	16.29± 0.44	17.88±1.02
2	Creatinine(mg/dl)	0.95± 0.62	1.03±0.08
3	ALT(IU/L)	30.47 ± 0.98	42.24±1.2**
4	AST(IU/L)	39.86±0.36	40.34±0.23
5	ALP(IU/L)	42.90±0.80	46.05±0.26
6	Total Protein(g/dl)	6.70±0.14	6.72±0.72

**: Significant at P<0.01 when compared to apparently healthy dogs; *: Significant at P<0.05 when compared to apparently healthy dogs

##: Significant at P<0.01 when compared to before therapy; #: Significant at P<0.05 when compared to before therapy

Discussion

Hematological studies

In the present study, in dogs affected with perianal tumours and taken up for therapy, an insignificant decrease of mean haemoglobin, PCV and TEC was noticed when compared to that of apparently healthy dogs. These findings were in accordance with the findings of Javad *et al.* [2] Kokila *et al.* [7] and Kokila *et al* [5]. The leukogram of perianal carcinoma cases revealed an insignificant elevation of total WBC count and neutrophils; decrease in lymphocytes and normal monocytes as well as eosinophils when compared to that of apparently healthy dogs. Similarly, insignificant increase was noticed with respect to platelet levels when compared to that of apparently healthy ones. The results were in partial

agreement with that of Kokila *et al.* [4] who documented neutrophilia in dog affected with perianal tumours.
Serum biochemical estimations in dogs with perianal tumours revealed a slight increase in BUN, serum creatinine, ALT, AST, ALP and total protein which were in accordance with the findings of Kokila *et al.* [4]

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