

International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
IJABR 2024; SP-8(8): 876-878
www.biochemjournal.com
Received: 25-06-2024
Accepted: 30-07-2024

Dr. VVV Amruth Kumar
Associate Professor,
Department of Veterinary
Medicine, College of Veterinary
Science, Mamnoon; Warangal;
Telangana, India

K Satish Kumar
Professor and University
Head, Department of
Veterinary Medicine; College of
Veterinary Science,
Rajendranagar, Telangana,
India

Effect of vincristine chemotherapy in peri anal tumours affected dogs

VVV Amruth Kumar and K Satish Kumar

DOI: <https://doi.org/10.33545/26174693.2024.v8.i8SI.3235>

Abstract

The objective of the present study was to evaluate the therapeutic efficacy of Inj. Vincristine in the treatment of peri anal tumours. Dogs that were presented to the Veterinary Clinical Complex for a period of two years were screened for the presence of peri anal tumours. The dogs that were confirmed for per anal tumours were subjected to treatment with Inj. Vincristine. The clinical recovery, hematological and biochemical parameters and the therapeutic efficacy of treatment were enumerated.

Keywords: Vincristine chemotherapy, peri anal tumours, dogs

Introduction

Perianal glands are modified sebaceous glands, they are referred as hepatoid glands, because of their histologic resemblance to hepatocytes. Three types of tumors occur commonly in and around the anus: perianal/circumanal/hepatoid gland tumor, apocrine gland tumor of anal sac, apocrine gland tumor around anus. Perianal adenomas comprise more than 80% of all perineal tumors and the third most common tumor in male dogs. Adenocarcinomas of anal sac apocrine glands are most often in female dogs and are aggressive tumors that often have associated hypercalcemia. Anal sac adenocarcinoma was reported to represent 2% of all skin tumors and 17% of perianal tumors in dogs. Treatment with chemotherapy may reduce the ability of the circulating cancer cells to establish viable colonies in lungs. Each of these treatments has its own advantages and disadvantages and no single treatment is found to be effective. Keeping this the present study was undertaken to know the effect of Vincristine chemotherapy in peri anal tumour affected dogs.

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 EDTA for estimation of hematological parameters. For separation of serum, 5 ml 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/dl. Packed cell volume was estimated by microhematocrit method and values were expressed as per cent.

Corresponding Author:
Dr. VVV Amruth Kumar
Associate Professor,
Department of Veterinary
Medicine, College of Veterinary
Science, Mamnoon; Warangal;
Telangana, India

Total erythrocyte count was examined by haemocytometer and the results were expressed as number of erythrocytes $\times 10^6$ per microliter of blood. Total leucocyte count was examined by haemocytometer and the results were expressed as number of leucocytes $\times 10^3$ 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. Dogs affected with peri anal tumours were treated with Vincristine (Inj. Oncovin) @ 0.5 mg/m² mixed with Normal saline and administered i/v once in a week for 5 weeks

Results

Clinical improvement

Clinical signs exhibited by peri anal tumours affected dogs were shown in table 1. Out of affected dogs, 10 dogs were taken up for therapeutic trial there was positive response in tumour mass in 5 dogs while the other 5 dogs did not show any response to therapy even after completion of 5 doses. Mild reduction of gross tumour size was noticed in 5 dogs taken up for therapy by day 21 (one week after 3rd dose) and partial response was noticed in these dogs by day 35 (one week after 5th dose). In these 5 dogs after completion of therapy, the tumour mass remained inert and did not reveal any progressive growth. In the present study

chemotherapy with Inj Vincristine has shown partial response of the tumour size, 5 out of 10 dogs showed partial response i.e only 50% of the dogs responded for the treatment, rest of the 5 (50%) dogs were showing stable disease/no change (NC) of the mass. In affected dogs out of the 5 dogs which showed partial response the other clinical signs were also relieved to a greater extent and the symptoms persisted in those which did not respond.

Table 1: Clinical signs seen in Perianal tumour affected dogs (No.=41)

Sl. No	Clinical sign		No of dogs	Percent
	Clinical sign		Number	percent
1	Masses in Perianal region		41	100
		Solitary nodules	18	43.90
		Multiple nodules	23	56.10
2	Dyschezia		35	85.37
3	Tenesmus and constipation		23	56.10
4	Discomfort		16	39.02
5	Hematochezia		15	36.59
6	Ulceration and licking		13	31.71
7	Anorexia		10	24.39
8	Weight loss and lethargy		9	21.95
9	Polydipsia and polyuria		8	19.51

Hematological findings

Haematological examination of dogs affected with perianal tumours before, during and after therapy revealed that the mean Hb, PCV and TEC had significantly declined ($p < 0.05$) from day 0 to day 35. Total Leucocyte count showed a significant decline by day 21 during therapy ($p < 0.01$) which continued until day 35. The neutrophils percents showed a significant decline during therapy until day 35 ($p < 0.01$) The mean lymphocyte count significantly increased ($p < 0.01$) during the course of therapy. Monocytes and eosinophils did not show any significant alterations. Platelet count after therapy showed a significant decline ($p < 0.01$) when compared to before therapy (Table 2).

Biochemical changes:

In dogs affected with perianal tumours, the mean post therapeutic biochemical values showed insignificant increase in the BUN, creatinine, and AST when compared to pre-therapeutic means. However serum ALT and ALP showed highly significant increase ($p < 0.01$) during therapy. Whereas an insignificant decline in total protein level was noticed post therapeutically when compared to pretherapeutic mean (Table 3).

Table 2: Mean haematological values of dogs in Apparently Healthy and Perianal tumours before, during and after therapy

S. No.	Parameter	Group I Apparently Healthy dogs (n=10)	Peri anal tumours affected dogs Before therapy (n=10)	Group VI Dogs During and after therapy (n=10)				
				7 th day	14 th day	21 st day	28 th day	35 th day
1	Haemoglobin (g/dl)	13.75 $\pm$ 0.51	12.96 $\pm$ 1.50	12.47 $\pm$ 0.2	11.64 $\pm$ 0.10	11.33 $\pm$ 0.2	11.02 $\pm$ 0.80	10.48 $\pm$ 0.10
2	PCV %	41.60 $\pm$ 0.91	38.88 $\pm$ 0.34	37.20 $\pm$ 0.2	35.37 $\pm$ 0.92	33.99 $\pm$ 0.56	33.06 $\pm$ 0.75	31.44 $\pm$ 0.63
3	TEC ($\times 10^6/\mu$ l)	6.63 $\pm$ 0.3	6.45 $\pm$ 0.70	6.38 $\pm$ 0.02	5.98 $\pm$ 0.01	5.66 $\pm$ 0.02	5.51 $\pm$ 0.02	5.24 $\pm$ 0.02
4	TLC ($\times 10^3/\mu$ l)	13.30 $\pm$ 0.86	17.15 $\pm$ 1.01*	16.37 $\pm$ 0.10	15.27 $\pm$ 0.20	13.71 $\pm$ 0.20##	12.15 $\pm$ 1.10	11.61 $\pm$ 1.20##
5	DLC (%)							
	Neutrophils (%)	72.0 $\pm$ 0.32	74.02 $\pm$ 1.8*	70.71 $\pm$ 1.01	66.71 $\pm$ 0.40	62.61 $\pm$ 0.65	58.51 $\pm$ 0.60	54.02 $\pm$ 1.38##
	Lymphocytes (%)	24.0 $\pm$ 0.14	21.05 $\pm$ 1.62*	23.98 $\pm$ 0.4	27.89 $\pm$ 0.40	32.33 $\pm$ 0.43	36.18 $\pm$ 0.62	40.61 $\pm$ 2.18##
	Monocytes (%)	2.00 $\pm$ 0.36	2.44 $\pm$ 0.52	2.60 $\pm$ 0.40	2.58 $\pm$ 0.71	2.21 $\pm$ 0.60	2.86 $\pm$ 0.77	2.69 $\pm$ 0.60
	Eosinophils (%)	2.00 $\pm$ 0.80	2.49 $\pm$ 0.28	2.71 $\pm$ 0.40	2.82 $\pm$ 0.28	2.85 $\pm$ 0.20	2.45 $\pm$ 0.20	2.68 $\pm$ 0.10
6	Platelets ($\times 10^5/\text{dl}$)	3.06 $\pm$ 0.24	3.11 $\pm$ 0.2	3.09 $\pm$ 0.11	2.69 $\pm$ 0.10	2.18 $\pm$ 0.11	1.76 $\pm$ 0.21	1.62 $\pm$ 0.12##

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

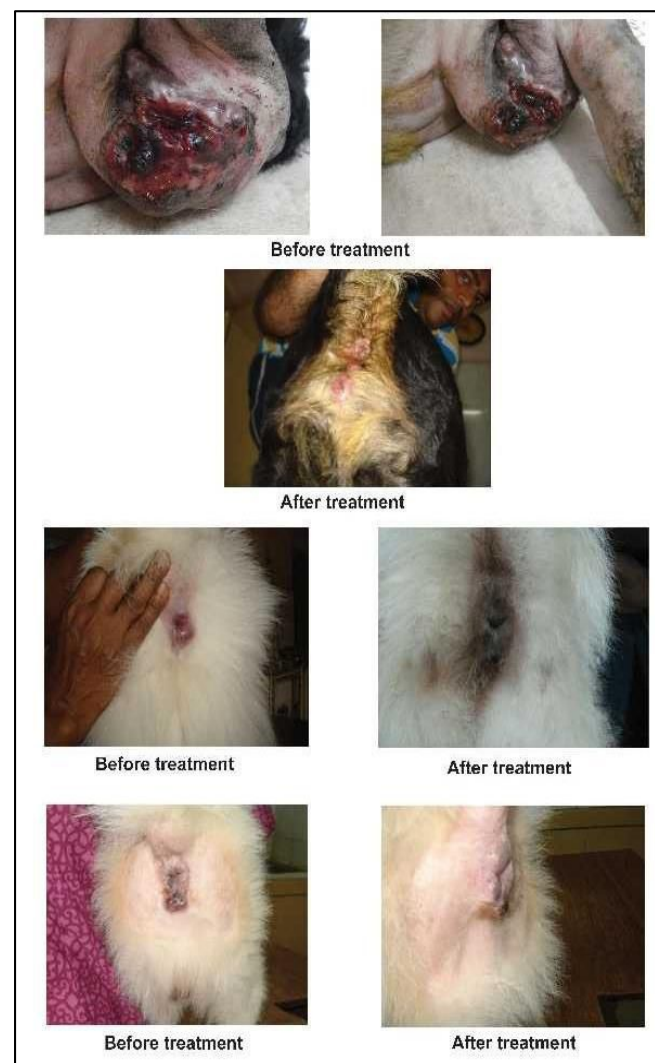
: Significant at $p < 0.01$ when compared to before therapy; # : Significant at $p < 0.05$ when compared to before therapy

Table 3: Mean serum biochemistry of dogs in Apparently Healthy and Perianal tumours before, during and after therapy

S. No.	Parameter	Group I Apparently Healthy dogs	Per anal tumour affected dogs Before therapy (n=10)	Group VI Dogs During and After therapy (n=10)				
		(n=10)	0day	7 th day	14 th day	21 st day	28 th day	35 th day
1	BUN (mg/dl)	16.29±0.44	18.01±1.57	19.48±1.24	20.95±1.24	22.42±0.12	23.89±0.93	25.36±0.74
2	Creatinine (mg/dl)	0.95±0.62	1.04±0.03	1.11±0.02	1.18±0.04	1.24±0.02	1.31±0.02	1.38±0.10
3	ALT (IU/L)	30.47±0.98	37.24±1.1*	44.99±0.2	48.74±0.2	52.48±0.3	56.23±0.1	59.98±0.1##
4	AST (IU/L)	39.86±0.36	40.74±0.2	44.23±0.2	47.73±0.2	51.22±0.1	54.72±0.1	58.21±0.1
5	ALP (IU/L)	42.90±0.80	46.98±2.3	54.27±0.3	61.56±0.3	68.84±1.02	76.13±1.01	83.42±1.02##
6	Total Protein (g/dl)	6.70±0.14	6.98±0.74	6.92±0.01	6.86±0.01	6.80±0.01	6.74±0.01	6.68±0.01

** : 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

Dogs affected with perianal tumours were treated with Vincristine (Inj. Oncovin) @ 0.5 mg/m² mixed with Normal saline and administered IV once in a week for 5 weeks. Similar treatment was given by Kokila *et al.* (2016a) [4, 5]. The treatment protocol was restricted to five weeks because of the owners inability to continue for further therapy. In perianal tumours affected dogs, out of the 5 dogs which showed partial response the other clinical signs were also relieved to a greater extent and the symptoms persisted in those which did not respond. The findings were in partial agreement with those of Kokila *et al.* (2016a) [4, 5] who reported that complete response in cases of perianal tumours with weekly dosing with Ini Vincristine for 4 weeks. The pharmacological action of vincristine was by inhibiting

mitosis which bonds with tubulin and prevent the formation of mitotic spindles (Khan *et al.*, 2009) [2].

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.* (2013) [1], Kokila *et al.* (2013a) [3] and Kokila *et al.* (2016b) [4, 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.* (2016a) [4, 5] 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.* (2016a) [4, 5].

Side effects

Nausea, vomiting, anorexia anaemia, mild alopecia and weight loss were the side effects noticed during treatment with Inj. Vincristine. Three dogs showed side effects like nausea and in-appetence from day 14 (after second dose of therapy). In addition to the above signs vomiting, weight loss and alopecia were noticed from day 21 (after third dose of therapy). Similar side effects were reported by Kokila *et al.* (2016 a, b) [4, 5].

References

- Javad J, Abbas T, Atefeh S, Mehdy A, Shohreh AS, Radmehr S, *et al.* Evaluation of an anal sac adenocarcinoma tumour in a Spitz dog. *Asian Pacific Journal of Tropical Biomedicine*. 2013;3(1):74-78.
- Khan LA, Khante GS, Raut BM, Bodkhe AM, Chavan MS, Pagrut NS, *et al.* Incidence of venereal granuloma and its medicinal treatment in stray dogs of Nagpur City. *Veterinary World*. 2009;2(1):13-14.
- Kokila S, Veena P, Sureshkumar RV, Sankar P, Dhanalakshmi N, Srilatha Ch, *et al.* Anal sac adenocarcinoma in dogs. *Indian Veterinary Journal*. 2013;90(5):86-87.
- Kokila S, Veena P, Sureshkumar RV, Srilatha Ch. Clinical studies on perianal tumours in dogs. *Indian Veterinary Journal*. 2016;93(7):28-30.
- Kokila S, Veena P, Sureshkumar RV, Srilatha Ch. Clinical studies on anal tumours in dogs. *Indian Journal of Animal Research*. 2016;50(4):629-631.