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## Comparative efficacy of Doxycycline & Rifampin against ehrlichiosis

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### Abstract

A total of forty-seven clinical cases were presented at veterinary clinical complex, college of veterinary science and animal husbandry, Mhow, (M.P.), which were diagnosis as monocytic ehrlichiosis on the basis of history of ticks infestation, characteristic clinical features fever, mucosal paleness, depression and hematological examinations. They were grouped randomly into 2 groups of 8 dogs in each group. First treatment group was scheduled by prescription of 10 mg/kg/wt Doxycycline for 21 days. The second group treated with Rifampin 15 mg/kg/wt for 21 days. Both group Shows 100% recovery on 21<sup>st</sup> day. All the hematological parameters significantly improved at 14 days of medication.

**Keywords:** Canine monocytic ehrlichiosis, ticks infestation doxycycline, rifampin, hematological

### Introduction

Canine Ehrlichiosis acknowledged as an important and potentially fatal infectious disease of dogs and other members of canidae family, distribute all over the world with widely prevalent in tropical and subtropical areas. The disease is caused by *Ehrlichia canis* and recognised with various names like “tracker dog disease,” “tropical canine pancytopenia,” “canine hemorrhagic fever,” and “canine typhus” (Medina and Mata, 2015) [3]. Canine monocytotropic ehrlichiosis is an important canine disease with a worldwide distribution, which was initially identified by Donatien and Lestoquard in Algeria in 1935 (Donatien and Lestoquard, 1937) [1]. The organism resides and replicates in the cytoplasm of circulating monocytes and macrophages, and it is transmitted biologically by a common dog tick *Rhipicephalus sanguineus* in which only transstadial transmission is reported. The infection is progressing from acute to subclinical and chronic phases that may be lasted for different times. The incubation period of *Ehrlichia canis* varied from 8 to 20 days (Salib and Farghali, 2015) [4].

### Materials and Methods

Dogs presented at TVCC Veterinary College Mhow, (M.P.) were included in the present study. The dogs for the study were selected on the basis of history and clinical signs like high rise of temperature, congested mucous membrane, tick on the body, severe dullness, and depression which were not respond to the antibiotic therapy. Total of 3ml blood sample of dog was collected aseptically from the saphenous vein at 0 day, 14<sup>th</sup> and 21<sup>st</sup> days.

The following haematological parameters were carried out as total erythrocyte count (TEC) (million / $\mu$ l), total leucocyte count (TLC) (thousand/cu.mm), haemoglobin (Hb) (g/dl), packed cell volume (PCV) (%), differential leukocyte count (DLC) (%), platelet count (thousand/ $\mu$ l) and clotting time (minutes).

The efficacy of two drugs i.e. doxycycline and rifampin was studied. A total of 16 dogs were selected to compare efficacy of the drugs. These dogs were divided into two groups having 8 dogs in each group.

**Table 1:** Treatment and days of observation of Ehrlichia positive dogs under different groups

S. No.	Group	Drug	No. of Dogs	Dose rate of drugs mg/kg BW	Days of observation
1.	Group- I	Tab. Doxycycline	8	10 $\times$ 21 days	0, 14 <sup>th</sup> , 21 <sup>st</sup>
2.	Group- II	Tab. Rifampin	8	15 $\times$ 21 days	0, 14 <sup>th</sup> , 21 <sup>st</sup>

The dogs of both groups was treated with supportive therapy like Tab. Paracetamol @ 10 mg/kg body weight, and liver supportive like injection of B complex and liver extract @ 1.5 ml I/M twice in a week.

## Results and Discussion

The dogs under study were observed for the improvement in clinical signs and reduction in clinical variants on 0, 14<sup>th</sup> and 21<sup>st</sup> day of medication along with blood collection for haematological studied. The parameters specifically noticed

were the absence of *Ehrlichia morulae* in blood smear examination stained with Giemsa on 14<sup>th</sup> day and improvement in haematological values.

The values of haemoglobin (g/dl) was significantly increased ( $P<0.01$ ) from 0 to 14<sup>th</sup> and 21<sup>st</sup> day after treatment in both group 1 and group 2. From the haematological parameters it was noted that decreased Hb an indication of anaemia. The dogs infected with ehrlichiosis disease had lower Hb. Ehrlichiosis affected dogs showing anemia might be due to bone marrow aplasia (Weiss, 2005)<sup>[7]</sup>.

**Table 2:** Pre and Post- treatment haematological values in *Ehrlichia* positive dogs under different groups

Parameter	Group	Pre-treatment	Post- treatment	
		0 <sup>th</sup> Day	14 <sup>th</sup> Day	21 <sup>st</sup> Day
Hb (g/dl)	1	9.62±0.54 <sup>c</sup>	11.22±0.43 <sup>b</sup>	13.16±0.37 <sup>a</sup>
	2	8.48±0.47 <sup>c</sup>	11.60±0.47 <sup>b</sup>	13.02±0.25 <sup>a</sup>
PCV (%)	1	34.86±3.16 <sup>ab</sup>	34.25±1.42 <sup>b</sup>	39.50±1.10 <sup>a</sup>
	2	26.18±1.34 <sup>b</sup>	34.94±0.76 <sup>a</sup>	39.07±0.76 <sup>a</sup>
Neutrophil (%)	1	78.50±2.83 <sup>a</sup>	70.75±2.17 <sup>b</sup>	66.37±1.16 <sup>b</sup>
	2	81.12±1.17 <sup>a</sup>	72.62±1.37 <sup>b</sup>	66.62±1.08 <sup>c</sup>
Lymphocyte (%)	1	16.75±2.13 <sup>c</sup>	24.62±1.94 <sup>b</sup>	29.25±1.22 <sup>a</sup>
	2	17.25±1.53 <sup>c</sup>	23.87±1.33 <sup>b</sup>	29.25±0.67 <sup>a</sup>
Monocyte (%)	1	3.50±0.92 <sup>a</sup>	3.62±0.53 <sup>a</sup>	3.87±0.39 <sup>a</sup>
	2	3.00±0.65 <sup>a</sup>	2.75±0.45 <sup>a</sup>	3.75±0.45 <sup>a</sup>
TEC (million/cu.mm.)	1	4.42±0.31 <sup>b</sup>	5.77±0.23 <sup>a</sup>	6.31±0.19 <sup>a</sup>
	2	4.43±0.18 <sup>b</sup>	5.82±0.26 <sup>a</sup>	6.48±0.21 <sup>a</sup>
TLC (thousand/cu.mm)	1	20.55±5.77 <sup>a</sup>	12.37±1.31 <sup>b</sup>	8.30±0.53 <sup>b</sup>
	2	16.50±1.11 <sup>a</sup>	10.70±0.88 <sup>ab</sup>	7.26±0.75 <sup>b</sup>
Thrombocyte (thousand/μl)	1	52.87±3.22 <sup>c</sup>	94.37±2.04 <sup>b</sup>	152.50±9.59 <sup>a</sup>
	2	58.25±3.18 <sup>c</sup>	98.12±4.16 <sup>b</sup>	155.62±4.31 <sup>a</sup>
Clotting time (per min)	1	7.81±0.42 <sup>c</sup>	5.56±0.16 <sup>b</sup>	3.52±0.20 <sup>a</sup>
	2	7.76±0.32 <sup>c</sup>	5.56±0.19 <sup>b</sup>	3.48±0.15 <sup>a</sup>
Blood smear examination	1	+ve	-ve	-ve
	2	+ve	-ve	-ve

The values of thrombocyte (thousand/μl) was significantly increased ( $P<0.01$ ) from 0 to 14<sup>th</sup> and 21<sup>st</sup> day after treatment in both group 1 and group 2. thrombocyte values. Thrombocytopenia may be due to increased platelet consumption due to inflammatory changes in blood vessel endothelium, increased splenic sequestration of platelets, and immunologic destruction or injury resulting in a significantly decreased platelet life span (Harrus *et al.* 1999)<sup>[2]</sup>. Platelet survival time decreased from a mean of 9 days to 4 days, 2 to 4 days after infection with *E. canis* detected by using radioisotopes (Smith *et al.* 1974)<sup>[5]</sup>. Demonstration of serum platelet-bindable antiplatelet antibodies (APA) in dogs after experimental infection with *E. canis* supports the assumption that immune destruction may also contribute to the pathogenesis of thrombocytopenia in acute ehrlichiosis (Warner *et al.* 1995)<sup>[6]</sup>.

It was noticed that all 8 out of 8 animals showed improved haematological values and clinical variants to a remarkable level by 14<sup>th</sup> day. Each blood smear negative for ehrlichiosis morulae in side the monocyte. A 100% recovery in ehrlichiosis was observed in group I and II by the 21<sup>st</sup> day under medication.

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