

Selective Red Cell Variables in Chippiparai Hound Breeds of Tamil Nadu- a Pilot Study in 30 Dogs

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ABSTRACT

Globally, many clinico-pathologic differences between hounds and other breeds have been investigated and most of the research has been focused on differences in the hematologic values between the breeds and hematologic reference intervals for the Greyhounds, which have been recently published. However, our native hound, Chippiparai, closely resembles the morphological traits of the hounds and yet there are no published reports on the hematological parameters of the Chippiparai breed from Tamil Nadu. Hence, this study was carried out to investigate the red cell variables like Hemoglobin, Packed Cell Volume and RBC counts which were compared with that of non-hound breeds. Chippiparai hound dogs (n=30) and non-hound dogs (n=30) were selected amongst the dogs presented at Madras Veterinary College Teaching Hospital and various native hamlets. The Hb, PCV and RBC level in the Chippiparai breeds were found to be higher which may probably be attributed to the need for appropriate oxygen supplementation under extreme climatic conditions, for running and hunting and probably as an inheritance from the other sight hounds. Also, these breeds can be recommended as good blood donors since a lesser volume of their transfused blood (with greater PCV) can increase the hematological parameters of the anemic recipient dog as compared to an equal volume of blood from the non-hound blood donors.

Key Words: Chippiparai, hounds, hemoglobin, RBC, blood donor

INTRODUCTION

Chippiparai dogs are native breeds of Tamil Nadu and are believed to be linked with the ancient Egyptian Saluki breeds and the Grey hounds. The morphology, appearance and characteristics resemble the Saluki's to a greater extent as compared to the Grey hounds. Recent awareness

regarding raising our native hounds, amongst pet owners and breeders to prevent their extinction are leading to progressive increase in the population of this breed in Veterinary practice. Interestingly, these hounds were found to have higher values of hematological parameters such as Hemoglobin, Packed Cell Volume, Red Blood Cell, and Mean corpuscular volume when compared with other non-hound breeds during our observation. Hence, a pilot study was carried out to report the unique high normal hematological parameters in healthy Chippiparai dogs. Earlier studies have reported that Greyhounds have higher

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HCT, Hemoglobin (HB) concentration, MCV, MCH and MCHC when compared with values of non-Greyhound dogs. Thus, a need to establish reference intervals specific for *Chippiparai* dogs was studied at the Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University during 2013-14.

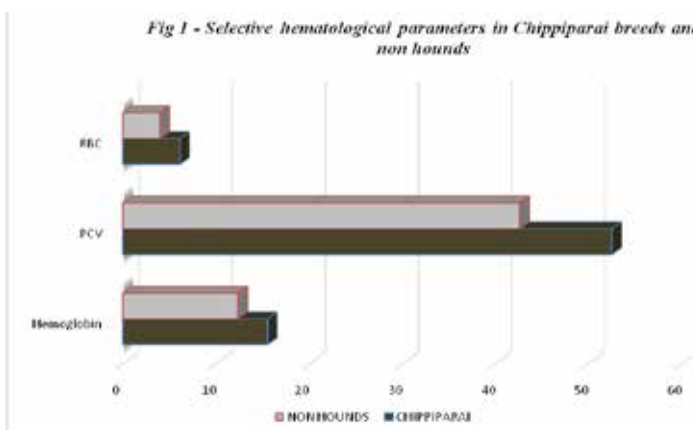
MATERIALS AND METHODS

Chippiparai dogs ($n=30$) between the age group of one to eight years were analyzed for normal hematological parameters wherein utmost care was maintained in morphologically assessing the confirmation of these hounds. Non hound dogs($n=30$) like German Shepherd, Mongrels, Labrador, Boxers, Spitz and the

hound breed Chippiparai brought to the Madras Veterinary College and Teaching Hospital, from kennel clubs/ dog breeders around Chennai, in and around hamlets of Tirunelveli and Madurai were included in this study. Emphasis was given to the Chippiparai hounds based on the previous study of the prevalence of DEA blood groups. Sick dogs and free roaming dogs were excluded from the research. About two ml of whole blood was collected from the cephalic vein, stored at 4°C and tested within 24 hours. Hematology was performed using hematological auto-analyzers (BC Vet auto-analyzer) to estimate Hemoglobin, Packed Cell Volume, Red Blood Cell count and the results were statically analyzed using Independent T test (Table- 1 and Figure - 1).

Table - 1. Red Cell variables in *Chippiparai* breeds ($n=30$) and Non-hound breeds German Shepherd, Labrador and Boxers ($n=30$)

Parameters	<i>Chippiparai</i>		Non-Hound		T Stat	P - Value
	N1	MEAN ± SE	N2	MEAN ± SE		
Hb	30	17.45 ± 2.1381	30	11.61 ± 0.1706	2.72**	0.0086
PCV	30	53.55 ± 0.6165	30	41.56 ± 0.3007	17.48**	0.0000
RBC	30	5.88 ± 0.0868	30	4.22 ± 0.0704	14.88**	0.0000



RESULTS AND DISCUSSION

The results indicated an average Hb of 17.45 ± 2.1 g/dl, PCV of 53.55 ± 0.61 % and RBC count of 5.88 ± 0.08 million/cmm in the current study. The mean values were obtained for the above-mentioned parameters for the two groups under study i.e. Chippiparai dogs and Non-Hound dogs and compared using Independent T test statistics. The following results indicate that the difference in the mean of all the parameters under investigation vary greatly between the two groups under study. The P – value for all the above studied parameters were found to be < 0.001 , which indicates that the mean values of the parameters Hb, PCV and RBC for both the groups under consideration vary significantly. There is a highly significant difference among the means of Hb, PCV and RBC between both the groups under the study, indicating that the two groups differ significantly from each other.

The results thus obtained from the study reveal that the indigenous *Chippiparai* hound breed has a higher value of the red blood cell variables such as Hb, PCV and RBC which is statistically significant.

In western countries, much studies on breed specific reference range for Red Cell variables and other biochemical profiles have been reported for German shepherds and Golden retrievers (Lund *et al.*, 2000). Greyhounds and Saluki hounds for that matter closely resemble our native Chippiparai breed and seem to have an acquired physiological adaptation similar to them. These breeds are well known for their athleticism, superior hunting and racing

performance and widely used for hunting in the mountain areas which probably contribute to their higher total oxygen-carrying capacity (Zaldivar-López *et al.*, 2011). More research has been emphasized in establishing breed specific parameters for greyhounds and have opined a higher than average value of haematological parameters as compared to other non-hound breeds (Campora *et al.*, 2011).

Higher muscle mass and acquired physiological adaptation differentiates these hounds from non-hound breeds. Thus, it is imperative that field veterinarians, academicians and researchers including clinical pathologists need to update and be aware of this unique high hematologic characteristics of the breed which would prove to be vital in making accurate diagnosis for these breeds (Mesa – Sancez *et al.*, 2012). The high concentration of RBC and Hb in the Chippiparai breeds may probably be understood as a need for appropriate oxygen supply under extreme climatic conditions for running and hunting attitudes and probable inheritance from the sight hounds as per literatures (Sullivan *et al.*, 1994).

More over these breeds can be recommended as canine blood donors since a lesser volume of their transfused blood (with greater PCV) can increase the hematological parameters of the anemic recipient dog.

For example, for an anemic recipient dog weighing 10 kg with PCV of 15 % would need approximately 300 ml from a non-hound donor or 200 ml (approx) from a Chippiparai donor dog to achieve a desired PCV of 30 based on the following formula-

$$\text{(Vol of blood required (ml))} = \text{Bwt of recipient (kg)} \times 80 \times \frac{\text{(Desired PCV- Recipient PCV)}}{\text{Donor PCV}}$$

$$\text{Vol of blood required from a non- hound dog} = 10 \times 80 \times \frac{(30-15)}{40} = 300 \text{ ml}$$

$$\text{Vol of blood required from a Chippiparai dog} = 10 \times 80 \times \frac{(30-15)}{55} = 218 \text{ ml}$$

Further, mean cell volume, potassium, urea, alanine amino transferase, aspartate amino transferase, alkaline phosphatase and cholesterol were also found to be significantly higher in deer hounds as compared to the average dog populations (Sheerer *et al.*, 2013), which needs further investigation in our indigenous *Chippiparai* breeds.

With regards to *Chippiparai*, further investigation into other parameters including, thyroid hormones, cardiac troponin, oxyhemoglobin dissociation curve, RBC 2,3-diphosphoglycerate (2,3-DPG) concentration, the partial pressure of oxygen and other underlying factors that influence the unique high hematological features should be investigated in a larger population.

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