



EFFECT OF MONTHS ON LEVELS OF SOME HEMATOLOGICAL PARAMETERS OF IRAQI ONE- HUMPED FEMALE CAMELS (*CAMELUS DROMEDARIUS*)

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ABSTRACT

The study was conducted on twelve Iraqi one-humped female camels (*Camelus dromedarius*) of 7- 8 years old, presented in animal farm, College of Veterinary Medicine, University of Anbar, during the period from September, 2012 to January, 2013. The study was aimed to find out the effect of certain months of the year on the levels of some hematological parameters. Results showed that there is no significant difference between months on Packed Cell Volume (P.C.V), Red blood cells (RBC's), Mean Corpuscular Volume (MCV), Neutrophils and Lymphocytes. Results also showed that hemoglobin percentage (Hb) were high during November, October and December as compared with September. The count of white blood cells (WBC's) was high during October, December and September and low during November. The highest ($P<0.05$) values of Erythrocyte sedimentation rate (ESR) were recorded during September, December and October and the lowest value during November. The mean Corpuscular Hemoglobin (MCH) showed a significant difference between months of year, increased significantly ($P<0.05$) during December, November and October and decreased in September. Mean Corpuscular Hemoglobin Concentration (MCHC) was high in December, November and October and low in September. The highest monocytes was recorded during November and October and the lowest during December and September. This study also showed that the levels of eosinophils were high during December, October and November as compared with September. Basophils were high during November and low during September, October and December. It was concluded that there is a clear effect of months on some hematological parameters of Iraqi one- humped female camels.

KEYWORDS: Camel, hematological parameters, months

INTRODUCTION

Reproduction is an important factor in the economics of the animal production. The camel is a domesticated animal whose full agricultural reproductive potential has not yet been achieved. It is fully adapted to the rigours of the extreme diurnal variations of temperature of the arid zones of Africa and Asia and therefore requires little expenditure in terms of housing or shelter (El-Hairiry *et al.*, 2010). Blood is the mirror of the beings health, it is an index for several metabolic processes of the body and reflect the status of the functioning organs of the body and health, hence production of the animal. On the other hand, the blood hemogram and its biochemical constituents are considered important information in relation to the health status of the camel (Momenah, 2014). Hematology is the study of blood and blood-forming organs including the diagnosis, treatment, and prevention of diseases of the blood, bone marrow, and immunologic, haemostatic, and vascular systems. It is routinely used for the diagnosis and treatment of animal diseases (Washington and Hoosier 2012). The present study aimed to investigate the effect of different months on the levels of some hematological parameters in the one- humped camel.

MATERIALS & METHODS

This study was conducted at the Animal Farm, College of Veterinary Medicine, University of Anbar during the period from September, 2012 to January, 2013. This

experiment included 12 multiparous, non-lactating Iraqi one-humped female camels (*Camelus dromedarius*) of 7- 8 years old and average body weight of 450-500 kg. Animals were daily fed per head of 4 kg green roughages (alfalfa, barley and sorghum), 10 kg of alfalfa hay and 0.5 kg of barley grains (Farid, 1995). Water and mineral blocks were available *ad libitum*. Blood sample (10 ml) was collected via jugular vein with heparinized vacutainer tubes. The blood samples were analyzed for Packed Cell Volume (P.C.V) by microhematocrit, hemoglobin (Hb) by acid hematin (Sahli's haemoglobinometer) method, white blood cells (WBC's) and Red blood cells (RBC's) were counted in fresh blood sample using haemocytometer and counted at $\times 40$ objective of phase contrast microscope according to Hawakey and Dunnett (1989), Erythrocyte sedimentation rate (ESR) was determined by westergren sedimentation tubes, Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), and Mean Corpuscular Hemoglobin Concentration (MCHC) were calculated using the formula of Jain (1998). Differential leukocytic count (DLC) neutrophil (%), lymphocyte (%), monocyte (%), eosinophils (%), basophil (%) were determined microscopically from counts of 200 leucocytes in thin May-Grunwald-Giemsa stained blood smears (Kelly, 1984).

Statistical analysis: The data were presented as means $\pm$ S.E. and subjected to analysis by using one way of analysis (ANOVA) post hoc test was used LSD to specify the significant difference among means (Snedecor and

Cochran, 1989). The software package IBM SPSS program, version 20 was used for the analysis of data.

RESULTS

Table (1), showed the results of hematological picture of she-dromedaries camel Packed Cell Volume (P.C.V) in the female camels during different months showed no significantly difference. The effects of the different months on hemoglobin percentage (Hb) were significant ($P < 0.05$). It is higher during November, October and December as compared with September. The highest count of white blood cells (WBC's) was recorded during October, December and September and the lowest count at November month. The effects of different months of the year on RBC's of the female camels were non- significant. The highest (value of ESR was recorded during September, December and October and the lowest value at November month. Mean of Corpuscular Volume (MCV) was not differed significantly due to months of year. Mean Corpuscular Hemoglobin (MCH) showed significant different at months of year. It was increased significantly ($P < 0.05$) during December, November and October months and decreased in September. Mean Corpuscular Hemoglobin Concentration (MCHC) showed higher value in December, November and October months and lower value in September. Statistical analysis showed non-significant difference in neutrophils and lymphocytes through months of the year. The highest ($P < 0.05$) monocytes was recorded during November and October and the lowest ($P < 0.05$) during December and September month. The effects of the different months on the eosinophils were significantly ($P < 0.05$) higher during December, October and November than September month. Basophils was significant ($P < 0.05$) increased during November and decreased ($P < 0.05$) at September, October and December.

DISCUSSION

The camel's blood plays a key role in adaptive mechanisms to high heat load and dehydration (Oujad and Kamel, 2009). Blood composition and volume remains relatively constant and haemoglobin function remains normal (Wilmar *et al.*, 2006). In this study, the results were within normal limit estimates that reported by other worker (Bogin, 2000). The erythrocytes of the camel are oval shaped and non-nucleated which resist osmotic variation without rupturing; these cells can swell to duplicate their initial volume following rehydration (Oujad and Kamel, 2009; Irwin, 2010). The non-significant difference in P.C.V and RBC's count during different months is not agreed with results obtained by Babeker *et al.* (2013), but in agreement with those reported by Aichouni, *et al.* (2010). Hemoglobin percentage (Hb) was significantly ($P < 0.05$) higher during November, October and December than September month. These results disagree with those reported by Aichouni, *et al.* (2010) and Babeker *et al.* (2013). The white blood cells (WBC's) reported in the current study are similar to that results reported by Babeker *et al.* (2013), but not in agreement with those obtained by Aichouni, *et al.* (2010). The increasing of hemoglobin during non-breeding season (September, October and November) may be due to that the iron and copper are essential for hemoglobin synthesis,

since camels during the breeding season lose their appetite and body condition with diarrhea (Schalm *et al.*, 1975). The pasture quality and quantity are influenced by the seasonal changes in rainfall, which in turn could influence the nutritional status and consequently the blood constituents of camels. The high mean of ESR was recorded during September, which was differed significantly ($P < 0.05$) as compared with means in October and November. This could be attributed to dehydration, asphyxia, excitement that leads to release of erythrocytes from the spleen (Dukes, 1993). These results are consistent with those obtained by Babeker *et al.* (2013).

The non-significant effect of month on the MCV in the present study confirmed the results obtained by Aichouni, *et al.* (2010). Results revealed that the MCH increased significantly ($P < 0.05$) in October, November and December as compared with September. Similar result reported by Aichouni *et al.* (2010). The increasing of MCH could be due to hypotonic and hypertonic of RBCs to absorb water and hemolyze before their RBCs membrane can accommodate the change (Shimizu, *et al.*, 1979; Ogawa *et al.*, 1989).

The RBC count was inversely proportional to MCV which is the indicator of red cell size. This is in line with the belief that the smaller the size of red cells the greater their number per unit volume of blood (Kerr, 1989).

The MCHC in camels is generally over 40%, which is considerably in excess of the range of 30 to 36% common to animals with discoid erythrocytes. The variation in various erythrocytic indices may be attributed to differences in RBC size, its oxygen carrying capacity in connection with age and physiologic state. The difference might be due to the differences in technique applied for their measurements (Aichouni *et al.*, 2010 and Farooq *et al.*, 2011).

Increasing WBC counts with a tendency for neutrophilia observed in this study suggests that this problem is originally an inflammatory process. Neutrophils are usually considered the first line of cellular defense mechanism against pathogens (Feldman *et al.*, 2000). Leukocytes usually increase following exposure to infection, and camels included in these studies might have had subclinical infection (Salman and Afzal, 2004). The non- significant difference in neutrophils and lymphocytes during different months of year is disagree with those obtained by Aichouni *et al.* (2010). Significant difference of each of the monocytes, eosinophils and basophils during different months of year that are recorded in this study are not in agreement with the results Aichouni *et al.* (2010). It was concluded that, there are few variations between the present findings and those from previous workers that may be attributed to the differences in breeds, nutrition, husbandry or assay methodology, diseases or metabolic changes reflect the different physiology, genetics and environmental conditions.

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TABLE 1: Mean $\pm$ S.E of the hematological parameters in the one- humped camel on different months of the year

Month	P.C.V (%)	Hb (g/dl)	WBC's (cell/mm)	RBC's ($\times 10^6/\text{mm}^3$)	ESR (mm/1hr)	MCV (fl)	MCH (pg)	MCHC (%)	N (%)	L (%)	M (%)	E (%)	Ba (%)
September	29.25 $\pm$ 0.84 A	12.23 $\pm$ 0.37 B	9.45 $\pm$ 0.32 AB	7.38 $\pm$ 0.22 A	7.00 $\pm$ 0.50 A	39.61 $\pm$ 0.12 A	16.56 $\pm$ 0.03 B	41.81 $\pm$ 0.17 B	54.33 $\pm$ 1.93 A	39.08 $\pm$ 1.73 A	1.58 $\pm$ 0.14 B	4.83 $\pm$ 0.29 B	0.16 $\pm$ 0.11 B
October	30.75 $\pm$ 0.35 A	13.64 $\pm$ 0.35 A	10.33 $\pm$ 0.96 A	7.83 $\pm$ 0.16 A	6.33 $\pm$ 0.54 AB	39.34 $\pm$ 0.46 A	17.46 $\pm$ 0.19 A	44.36 $\pm$ 0.15 A	55.75 $\pm$ 1.87 A	34.91 $\pm$ 2.00 A	2.00 $\pm$ 0.21 A	7.16 $\pm$ 0.90 A	0.16 $\pm$ 0.11 B
November	30.58 $\pm$ 0.72 A	13.59 $\pm$ 0.72 A	8.33 $\pm$ 0.31 B	7.73 $\pm$ 0.17 A	5.41 $\pm$ 0.37 B	39.51 $\pm$ 0.22 A	17.56 $\pm$ 0.15 A	44.45 $\pm$ 0.28 A	52.41 $\pm$ 1.97 A	38.41 $\pm$ 1.91 A	2.08 $\pm$ 0.22 A	6.83 $\pm$ 0.36 A	0.25 $\pm$ 0.13 A
December	29.08 $\pm$ 0.86 A	13.00 $\pm$ 0.86 AB	10.26 $\pm$ 0.53 A	7.32 $\pm$ 0.22 A	6.50 $\pm$ 0.64 AB	39.70 $\pm$ 0.17 A	17.74 $\pm$ 0.08 A	44.70 $\pm$ 0.15 A	53.08 $\pm$ 1.09 A	37.58 $\pm$ 1.18 A	1.83 $\pm$ 0.11 B	7.50 $\pm$ 0.39 A	0.16 $\pm$ 0.11 B

Different superscripts within each column showed significantly difference (p <0.05).