

HAEMATOLOGICAL STUDIES DURING LATE PREGNANT AND EARLY LACTATION STAGE IN JAISALMERI CAMELS (*Camelus dromedarius*)

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ABSTRACT

In present study, haematological parameters were recorded during late pregnancy and early lactation in the Jaisalmeri breed of camel. Blood samples from 10 adult Jaisalmeri late pregnant and early lactating females were collected. The Complete Blood Count (CBC) was performed using automatic blood analyser. The Mean \pm SE of Erythrocyte count (RBC), Total Leukocyte count (TLC), Haemoglobin (Hb) and Haematocrit value (PCV) were $6.18 \pm 0.35 \times 10^6/\mu\text{L}$, $4.95 \pm 0.91 \times 10^3/\mu\text{L}$, 10.20 ± 0.41 g/dl and $25.69 \pm 1.16\%$, respectively in late pregnant females while $7.15 \pm 0.41 \times 10^6/\mu\text{L}$, $7.69 \pm 0.38 \times 10^3/\mu\text{L}$, 10.30 ± 0.50 g/dl and $23.38 \pm 1.24\%$, respectively in early lactating females of camel. The Differential Leukocyte Count i.e. Mean \pm SE values of Lymphocyte, Monocyte, Neutrophil, Eosinophil and Basophil percentage were $29.62 \pm 5.82\%$, $10.36 \pm 2.20\%$, $49.13 \pm 5.85\%$, $10.59 \pm 1.72\%$ and $0.30 \pm 0.04\%$, respectively in late pregnant females while $17.63 \pm 1.79\%$, $5.58 \pm 0.48\%$, $74.55 \pm 1.96\%$, $1.91 \pm 0.41\%$ and $0.33 \pm 0.03\%$, respectively in early lactating females of camel. Most of the findings of blood analysis were within the normal range except TLC and DLC. This may be due to the effect of physiological status of animal i.e. late pregnancy, early lactation and some diseased conditions. Total Leukocyte Count (WBC) was found to increase significantly ($P \leq 0.05$) during early lactation as compared to late pregnancy.

Key words: Camel, haematology, Jaisalmeri breed, lactation, pregnancy

Pregnancy and lactation are physiological periods that result in increased metabolic demands. Although, homeostatic mechanisms keep substances in the blood at relatively constant levels, some changes in the concentrations of haematological parameters occur indicative of the metabolic stress during pregnancy and early lactation. Haematological values of camels have been reported (Tornquist *et al*, 2010; Faye and Bengoumi, 2018). The haematological variations in response to stress during pregnancy and early lactation has not been studied in Jaisalmeri camels of Rajasthan. Present study was planned to assess the effect of late pregnancy and early lactation on the haematological parameters in the Jaisalmeri breed of camels.

Materials and Methods

Ten pregnant and early lactating females of Jaisalmeri breed of dromedary camel from Phalodi Tehsil of Jodhpur District, Rajasthan were selected for study. Blood samples were obtained from the Jugular vein. Blood was collected in test tubes containing K₂-EDTA and gently mixed. To avoid alterations related to diurnal variations, blood samples were collected at

the same time each day. The samples were stored in refrigerator till processing. The complete blood count (CBC) was performed using Automated Haematology Analyser i.e. (SpinCell 5 compact Vet Mode. Spinreact, Ctra. Sta. Coloma, 717176 St. Esteve de Bas GIRONA – Spain). Data was analysed statistically using t-Test.

Results and Discussion

The effects of late pregnancy and early lactation on the haematological parameters in Jaisalmeri camel were expressed as mean \pm standard error values (Table 1, Fig 1, 2 and 3). Total Leukocyte Count (WBC) was significantly increased ($P \leq 0.05$) during early lactation compared to late pregnancy.

The results showed that the neutrophils increase was highly significant ($P \leq 0.001$) during the early lactation compared to the late pregnancy. Postpartum neutrophilia observed in this study has also been reported previously (Ebissy *et al*, 2019), who attributed such finding to stress being associated with parturition and the beginning of lactation stage. Significant ($P \leq 0.05$) decrease in lymphocytes percentage was observed during early lactation

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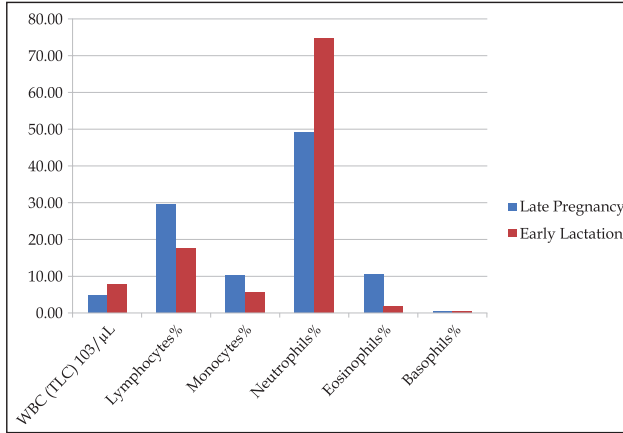


Fig 1. Leukocytes parameters of female camels during late pregnancy and early lactation (n = 10).

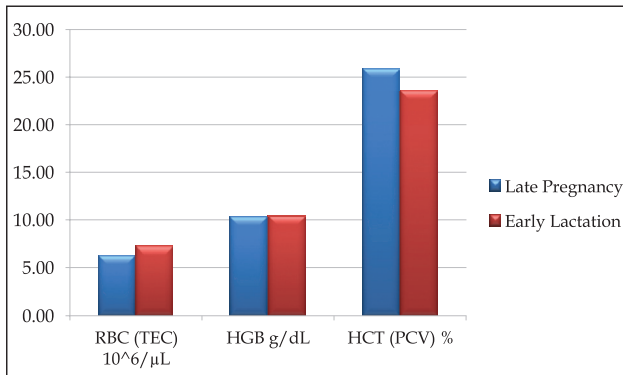


Fig 2. Erythrocytes parameters of female camels during late pregnancy and early lactation (n = 10).

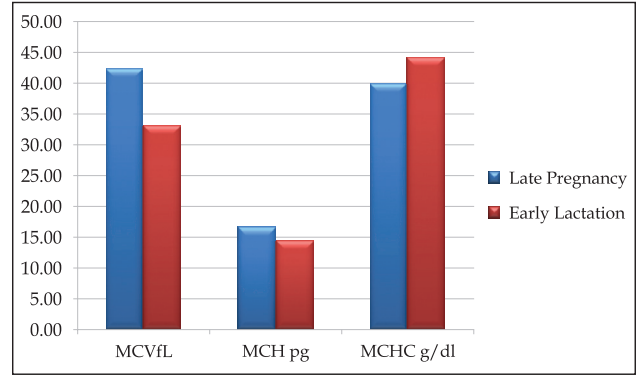


Fig 3. Erythrocytes parameters of female camels during late pregnancy and early lactation (n = 10).

compared to late pregnancy, whereas monocytes percentage increased during the late pregnancy and early lactation compared to the normal non-pregnant adult but monocytes percentage decreased significantly ($P \leq 0.05$) during early lactation compared to the late pregnancy.

Eosinophil percentage decreased significantly ($P \leq 0.001$) during the early lactation compared to the late pregnancy and increased in late pregnancy. This may be due to the effect of physiological status of animal i.e., late pregnancy.

The predominant white cells observed in the present study were neutrophils which in agreement with earlier results (Ayoub *et al*, 2003). The significant

Table 1. The effects of late pregnancy and early lactation on the haematological parameters in Jaisalmeri camel (n = 10).

S. N.	Parameter	Unit	Late Pregnancy Mean±SE	Early Lactation Mean±SE	Per cent Increase/ Decrease
1.	WBC (TLC)	10 ³ /µL	4.95 ± 0.91	7.69 ± 0.38*	+55.35
2.	LYM%	%	29.62 ± 5.82	17.63 ± 1.79*	-40.47
3.	MON%	%	10.36 ± 2.20	5.58 ± 0.48*	-46.14
4.	NEU%	%	49.13 ± 5.85	74.55 ± 1.96***	+51.74
5.	EOS%	%	10.59 ± 1.72	1.91 ± 0.41***	-81.96
6.	BASO%	%	0.30 ± 0.04	0.33 ± 0.03	-
7.	RBC (TEC)	10 ⁶ /µL	6.18 ± 0.35	7.15 ± 0.41	-
8.	HGB	g/dL	10.20 ± 0.41	10.30 ± 0.50	-
9.	HCT (PCV)	%	25.69 ± 1.16	23.38 ± 1.24	-
10.	MCV	fL	42.24 ± 1.74	32.87 ± 0.57***	-22.18
11.	MCH	pg	16.64 ± 0.60	14.39 ± 0.22**	-13.52
12.	MCHC	g/dL	39.70 ± 0.54	44.04 ± 0.27	-

NS = Non significant ($P > 0.05$)
*** = Significant ($P \leq 0.001$)

* = Significant ($P \leq 0.05$)

** = Significant ($P \leq 0.01$)

changes in neutrophils and lymphocytes and monocytes percentage could be due to cortisol and ACTH release in response to pregnancy and lactation stress.

The values changes of TEC (RBC), haemoglobin (HGB) and haematocrit (PCV) did not attain statistical significance during late pregnancy and early lactation. Such unchanged values of erythrocytes parameters during the transition period in camels can be taken as an indicator of the proper feeding and management regime. Although TEC, haemoglobin (HGB) and haematocrit (PCV) slightly increased during the late pregnancy and early lactation as compared to adult non-pregnant camels (Tornquist *et al*, 2010; Faye and Bengoumi, 2018) the MCV ($P \leq 0.001$) and MCH ($P \leq 0.05$) values decreased significantly, during the early lactation compared to the late pregnancy which may be attributed to the increased metabolic demand for oxygen consumption during late pregnancy as the animal has to fulfil the additional metabolic demands of the foetus. The effects of late pregnancy and early lactation on haematological parameters have not been studied in Jaisalmeri or any other breed of Rajasthani camels. However, a similar study in Jennies (Mariella *et al*, 2014) did not find significant differences in MCV, MCH and MCHC between late pregnancy and early lactation. It may be opined that camel females are under greater stress during late pregnancy in arid climates and hence the difference in response occurred. Most of the haematological values for Jaisalmeri camel (Mean \pm SE) used in this study were within the range as reported earlier by Tornquist *et al* (2010) except for TLC and DLC which may be due to the difference in breeds and physiological stage of camels in this experiment.

Late pregnancy and early lactation have a negative influence on the haematological parameters in camels. The observed neutrophilia could be attributed to a stress factor that being associated with the initiation of the lactation period.

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