

THE INFLUENCE OF PREGNANCY STRESS ON
MATERNAL BODY
WEIGHT, RECTAL AND VAGINAL TEMPERATURE OF
ARABI EWES

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SUMMARY

A study was carried on 14 Arabi ewes. These animals were placed under observation during the period laps between mid of January to the end of July of the year 2008, at Animal Farm-Collage of Agriculture- Basra university. The study was aimed to find out the effect of stress caused by pregnancy on maternal weight, rectal and vaginal temperature, changes in white blood cells and neutrophiles / lymphocyte ratio were used as stress indicator.

The results revealed that gestation body weight increased significantly ($p < 0.05$) in comparison to non pregnant animals. Maximal increases were observed during the last month of pregnancy. Rectal and vaginal temperature showed a significant ($p < 0.05$) elevation during 2nd and 3rd months of gestational period. A significant ($p < 0.01$) increase in white blood cell count was noticed during the late stage of pregnancy. These were accompanied with neutrophilia, and gradual decrease in lymphocytes. Results of neutrophiles / lymphocytes ratio revealed a significant increase ($p < 0.05$) during different months of pregnancy, which may indicate the effect of stress during late pregnancy, which is accompanied with summer season.

Kay word:- Pregnancy, stress, temperature, Arabi ewe

Introduction

Highly environmental temperature during the breeding season of Arabi sheep in southern Iraq may create a big challenge to females, leading to lower fertilizing rate and increasing the embryonic mortality (4), however, pregnant ewes exposed to heat for lengthy period often produce small lambs (8) and retard fetal growth. It was also reported that heat stress during gestation also reduce placental weight (10). The reduction in the placental mass or functions may have a significant effect on uterine flow and hormone secretion by the placenta to mammary growth or postpartum milk yield (16).

Physiological changes occurring in the mother during pregnancy can determine the out come of pregnancy in the terms of maternal body weight haematological changes, body temperature and lamb birth weight

Body temperature is an important process both as convenient and reliable marker of the operation of the biological clock (18) and as an indicator of the general health of an animal and of its energy metabolism (6), besides, studying the body temperature in farm animals is important not only from the an economic perspective as a greater knowledge of this process can lead to improvement in the live stock production practices (13). However, changes in rectal temperature have been used as indicator of physiological changes due to heat stress (26). Stress is an immune – suppressive factor (11). It also reported that lymphocytes and neutrophils were affected by different stressor, including ambient temperature (20). These studies showed that total number of lymphocyte decreases, and neutrophils increases, due to these stressor. the neutrophil lymphocytes ratio (N/L) has been widely used as indicator to heat stress in poultry (1) and to winter and summer seasonal stress and criterion for selection for stress resistance in sheep (2).

The information gained from this ratio could be used to determine the nature of the stress and the response of the defense mechanism of the animal (2). Apparently no investigation in the effect of breeding season. on some physiological parameters have been reported in Arabi ewes, Thus the objective of this study was to exam the effect of heat stress during the different period of gestation on maternal body weight, rectal and vaginal temperature, white blood cell (WBC) and their differential count, and lambing weight.

Materials and methods

The present study was conducted at Animal Breeding Farm, Collage of Agriculture – Basra university . Fourteen Arabi ewes were placed under observation before and during the gestation period .To synchronize estrus in ewes, an intravaginal sponges impregnated with medroxy-progestrone acetate (35 mg) were administrated. All ewes were kept under the usual feeding and were given 0.5 kg / day barely. Green alfalfa was supplemented every day and feed block supplementation was offered during all the studied period, which laps between mid of January to the end of July of the year 2008.

Measurements of rectal and vaginal temperature, dam body weight, and blood values were determined on the second day of the last week of each month of pregnancy till parturition. The parturition was diagnosed according to (3) . White blood cell counts (WBC) and differential counts were determined by the improved Neubauer heamocytometer according to (22,23) . Hundreds cell were differentially counted for individual , and out of these , the neutrophils / lymphocytes ratio was estimated (2) .Lamb birth weight was recorded at parturition. Statistical analysis was done according to Spss program (one way ANOVA 1998)

Results and Discussion

The effects of stage of pregnancy on body weight, vaginal and rectal temperature , white blood cell counts (WBC), differential count (neutrophils , lymphocyte ,and monocytes)and neutrophils/lymphocytes ratio are presented in Table -1-.

A significant increase($p<0.05$) are noticed in dams body weight during the last months of pregnancy (38.534, 40.440 kg) in comparison with non pregnant ewes (36.396 kg).The increase in maternal body weight may be related to fetus , placenta and amniotic fluid weight , which are accounted for less half of total amount of maternal weight gain (7).

Maternal body temperature (BT) and vaginal temperature (VT) were significantly ($p<0.05$) elevated in pregnant ewes . maximal BT and VT elevation occurred during second (39.873 and 39.886 C) and third month (39.856 and 39.859) of pregnancy respectively. The BT and VT remained significantly high ($p<0.05$) during the entire period of pregnancy in comparison to non pregnant (39.413 and 39.450 C) for BT and VT confirmed previous study (21)

The increase in BT and VT during the 2nd and 3rd months of pregnancy (Table 1) may be related to the increase of progesterone level which can increase the metabolic enzyme activity (9) same results were observed by (21). Changes in vaginal temperature could be used as useful tool for predicting parturition (19).

Table -1- contains the means of WBC and differential count during different period of pregnancy . WBC increased significantly ($p<0.05$) and registered its maximal values (14.262 and 14.406) in 4th and 5th months of pregnancy respectively . These results were closely in agreement with reports of (5,25) . The observed increased in WBC was accompanied with significant ($p<0.05$) increase of neutrophils and significant ($p<0.05$) decrease in lymphocytes on the last months of pregnancy . similar result was observed by (17) in both sheep and goat and (5) in gout during gestation period .Monocytes significantly decreased compared to values of non pregnant (25) also reported a marked decrease in monocytes count in gout during pregnancy.

N/L ratio as quickly diagnosed marks for stress (2) was used in this study to find out the effect of breeding season stress on some physiological parameters of pregnant ewes.

Table -1- revealed that N/L ratio was significantly ($p<0.05$) increased during pregnancy , these results could be due to the physiological increase of neutrophils count and decrease in lymphocytic count at late stage of pregnancy which was in agreement with results obtained in camels (14). Philosophy of this ratio is built on the fact that neutrophiles increases on stress while lymphocyte decreases (2).

Table(1) The effects of stage of pregnancy on body weight, vaginal and rectal temperature and some blood parameter

NL	Mono	Lymph	Neutro	WBC	VT	RT	Wht Pg	No
±1.2353 00.9373 ^{BC}	±4.6818 0.5679 ^B	±40.090 1.269 ^{AB}	±49.45 3.051 ^B	±11.522 2.01164 ^D	±39.759 0.141 ^B	±39.764 0.162 ^B	±36.829 3.509 ^B	1
±1.2110 00.8510 ^C	±4.5909 0.590 ^B	±40.772 1.445 ^A	±49.27 2.164 ^B	±12.669 1.44457 ^C	±39.886 0.143 ^A	±39.873 00.9847 ^A	±36.881 3.676 ^B	2
±1.2385 00.6394 ^C	±4.8182 0.39 ^{AB}	±39.909 1.151 ^{AB}	±49.36 1.465 ^B	±13.439 0.93458 ^B	±39.859 0.105 ^{AB}	±39.850 0.130 ^A	±37.157 3.676 ^B	3
±1.2701 00.5915 ^B	±4.7727 0.42 ^{ABC}	±39.681 0.839 ^B	±50.36 1.67 ^{BA}	±14.262 0.60575 ^A	±39.627 0.108 ^C	±39.636 00.9021 ^C	±38.534 3.650 ^A	4
±1.3421 00.4266 ^A	±4.9091 0.294 ^A	±38.454 0.739 ^C	±51.59 1.297 ^A	±14.406 0.47284 ^A	±39.709 0.243 ^B	±39.759 0.105 ^B	±40.440 ^A 3.781	5
±0.9895 0.15030 ^D	±5.0000 0.10 ^A	±39.733 2.243 ^{AB}	±39.74 4.692 ^C	±8.766 0.40067 ^E	±39.450 0.146 ^D	±39.413 0.168 ^D	±36.396 3.291 ^B	C

Correlation coefficient between the studied parameters (Table 2) showed a significant ($p<0.05$) correlation (0.187) between BT and maternal body weight while a highly significant correlation ($p<0.01$) was obtained between BT and VT (0.792), WBC (0.527) neutrophiles (0.583) and N/L

ratio (0.402). These results indicated that , the BT may represent the cause - and - effect relationship during the period of pregnancy and was explained by plasma hormone concentrations of maternal and fetal origin were altered by environment and heat stress altered endocrine dynamics during pregnancy (10).

Moreover, the significant correlation of rectal temperature may indicate the possible relation between peripheral levels of ovarian steroids and the degree of maternal hyperthermia (15). Thus it can be concluded that during pregnancy , Arabi ewes can adapt to marked variation in some parameters during breeding season.

Table (2) Correlation coefficient between the weight of pregnant ewes during pregnant period , blood parameter and weight of lambs

NL	Lymph	Neutro	WBC	VT	RT	Wht Pg	
-	-	-	-	-	-	0.187*	RT
-	-	-	-	-	0.792**	0.087	VT
-	-	-	-	0.395**	0.527**	0.301**	WBC
-	-	-	0.751**	0.419**	0.538**	0.138	Neutro
-	-	0.309-**	0.257-**	0.030	0.003-	0.077-	Lymph
-	0.566-**	0.957**	0.736**	0.353**	0.462**	0.160	NL
0.310	0.254	0.487	0.108-	0.264	0.041	0.709*	Wht lamb

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