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A Study of Some Physiological AspectsParameters in Late Gestation, and Early Lactationin Awassi Ewes.

Mohamed K. Hamed AL-AbsawiI andMohammed A.AL-safi
College of Veterinary Medicine- University of Al-Muthanna-Iraq,
Veterinary hospital in AL-Muthanna governorate/Iraq

Abstract

The present study was carried out in animals fieldFrom 30ewes(4.5-5.5) years oldat different physiological conditions were selected for this study.Theeweswere divided into three equal groups depending on their physiological conditions as follows: First group(10 ewes Non-pregnant)(control), Second group(10 ewes in 5th month of pregnancy) and third group(10 ewes in first month of lactation).The blood samples (10ml) were collected from Jugular vein at 2 week interval during pregnancy, first month of lactation.Five ml of collected blood in EDTA anticoagulant test tube for hematological studies, while other portion deposited into that without anticoagulant plastic tube to obtaining the serum samples for biochemical analysis

The study revealed the following results:

A significant decrease ($p \leq 0.05$) in the total (RBC) count, (Hb) and(PCV) in advanced gestationand the first month lactating animalscompared with control.

A significant increase ($p \leq 0.05$) in the serum total protein, albumin and globulins in late gestation groups compared with other studied groups.

INTRODUCTION

Physiological equilibrium is maintained mainly by the blood in the body (Geneser,1986), but many physiological conditions may alter this equilibrium .Hence , the haematological values during different physiological situations should be known for the diagnosis of various pathological and metabolic disorders which can adversely affect the productive and reproductive performance of cows leading to heavy economic losses (Pyne and Maria , 1981 ; Dutta, et al. 1988).

Sheep are an important animal in many countries because they can be successfully raised under harsh conditions and cost relatively little to maintain, Awassi breed is the most numerous and widespread breed of sheep and has admirably adapted to the rigorous conditions in Iraq, Awassi also resistant to diseases and parasites as well has growth abilities (Galal*et al*., 2008).

Metabolic disturbances, caused by inappropriate feeding without manifestation of clinical symptoms are significant in animal husbandry and may cause insufficiently developed breeding cattle (Radostits*et al*, 2003). Therefore the determination of normal values of hematological and blood biochemical value are important for the clinical interpretation of laboratory data. These indices may vary depending on factors such as sex, age, weather, stress, season and physical exercise (Sherman & Mary, 1994; Kaneko, *et al.* 1999; Nazifi, *et al.* 2003; Yokus*et al*. 2006.The level of biochemical parameters of the blood is important in

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determining the health and illness status of animals and in making clinical evaluation. So it should be understood how normal values turn into abnormal values due to many factors, such as management, feeding and illness (Utlu*et al*., 2004).

MATERIALS AND METHODS:

1- Experimental animals

Thirty ewes of ages (4.5-5.5) years and different physiological conditions were selected from animals farm for this study.These ewes were under the control of the condition health by veterinarians working at the farms.Pregnancy were diagnosed based on the records of the farm and to confirm the pregnancy and determine the age of the fetus, rectal palpation was used.All animals were maintained and housed under similar conditions of feeding and management. The animals were fed twice a day with green fodder and concentration mixture, and water was supplied ad libitum.

1-1-Experimental design:

Thirty ewes, (4.5-5.5)years old were divided into 3 groups, 10 animals in each group. The grouping was done depending on their physiological conditions as follows:

A. Group 1: non-pregnant heifers (control),B.Group 2: pregnant ewes (in the 5th month of pregnancy) C .Group 3: postpartum ewes in first month of lactation.

.2.Collection of Blood Samples.

All blood samples were collected between 9-10 am in order to standardize the time of collection which may affect certain blood parameters. Blood samples (8-10) ml were collected from jugular vein puncture at 2 weeks interval and at lactation during the experimental period from all animals .The (5ml) of blood collected form each animal were stored in plastic sample test tube containing ethylene diamine tetra a acetic acid (EDTA) anticoagulant for hematological studies , while another portion was deposited into tube without anticoagulant and allowed to clot at room temperature. Then the tubes were centrifuged at 3,000 rpm for 15 minute and the serum samples were stored at -18 ºc until used for biochemical analysis.

3.Hematological Analysis.

3.1. Red Blood Cell Count (RBCs) (Cell/mm^3)

The RBC count was obtained by the use of haemocytometer (improved Neubauer double) and (Hayme's solution) and special pipette for dilution (Sood 1996).The blood was suckled by the haemocytometer RBC count specified pipette to the mark 0.5, then was diluted by (Hayme's solution)by sucking to the mark 101, and the pipette was stirred horizontally to mix the solution, then some of the liquid drops were split to elevate the non diluted solution after that the special slide of the appliance was filled and covered then left for few minutes to permit the cells to settle over the counting squares area. The cells were counted in five centre squares of 25 squares (4 squares in the 4 angles and one square in the center) by the use of high microscopic amplification, and then the following equation of corpuscles counting (Cell/mm^3) was applied (Schalm, *et al* 1975).

No. of RBCs (Cell/mm^3) = No. of cells counted in five squares × 10000

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3.2. Hemoglobin Concentration (Hb) (g/dl).

The concentration of Hb was measured by the use of (Sahli appliance). Where 10 ml of HCl of 0.1 normally was poured in Sahli tube and 10µl of blood specimen was add and mixed together, and then the mixture was let for 10 minutes, and later on distilled water was add gradually till the colours of the blood tend to be similar to that of the standard tube colour. (Coles, 1986).

3.3. Packed Cell Volume (PCV) (%).

The microhematocrit method was used to calculate the percentage of PCV by the use of capillary tubes which contain heparin, where one end of which was closed by artificial clay after being filled to 3/4 of its length with blood, and it was put in microcenterfuge on velocity 1200 rotation/minute for five minutes, then the hematocrit value was obtain by Service device (Schalm*et al*., 1975).

3.4. Biochemical Tests.

using Chemistry auto analyzer made in Germany by human star company serial no. 20628 (picture 3), the machine has 54 wells which are numbered from 1 to 54, the samples deposited in each specific wells. The reagent was put in special container beside the wells. The serum biochemical parameters estimated by this instrument wereTotal protein , Albumin.
Test Procedure

Auto analyzer linked to a computer when opening its window is selected. Examination is meant by the icon method shows the information needed by the device such as the number of samples and a wavelength of kit, and then close the icon and open plan icon which will put the device the plan in order samples and quantities of drilling, according to figures requested by it and put Stander in the figures with other quantities. The reagent is placed in its own container quantities required by the device. The device wills remember the time for ending the test.

3.5. Statistical analysis:

Analysis was done using analysis of variance (one way ANOVA) through SPSS computer package version 11. The differences are considered to be significant at ($p<0.05$), and the differences between means were done by LSD, (Steel&Tornie, 1984). All data expressed throughout as mean ±SD.

4-RESULTS AND DISCUSSION:

4-1- Hematological parameters

4-1-1-Red blood cell (RBC) count.

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Table (1) the total RBCs count. (cell x 10^6) in Awassiewes during late gestationand early lactation. (Mean±SD)(n=10). .

Physical. State / Animals	non-pregnant (Control)	5th Month of gestation G2	1st month of lactation G3
Ewes	5.21±0.35A	4.50±0.57C	4.88±0.25B

The different large letters refer to significant differences at (p≤0.05) between groups inhorizontal row.

Table (1) show that the mean values of RBCs count were significantly low (p≤0.05)during 5th months of pregnancy and first month of lactation compared with non-pregnancy Awassiewes (control group).

Table (2) the hemoglobin concentrations Hb (gm/dl)inAwassi ewes during late gestation and early lactation. (Mean±SD).

Physical. State / Animals	non-pregnant (Control)	5th Month of gestation G2	1st month of lactation G3
Ewes	9.95±0.65 A	8.53±0.51 C	9.40±0.65 B

The different large letters refer to significant differences at (p≤0.05) between groups in horizontal row.

Table (2) show that the mean values of the highest Hb concentration was recorded non-pregnant ewes while the lowest values were observed in 5th month pregnant cows, the difference was statistically significant (p≤0.05).

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Table (3) the PCV (%)in Awassi ewes during late gestation and early lactation. (Mean±SD).

The different large letters refer to significant differences at (p≤0.05) between groups in horizontal row.

Physical. State / Animals	non-pregnant (Control)	5th Month of gestation G2	1st month of lactation G3
Ewes	28.83 ±1.70A	25.50 ±0.52C	27.50±1.70B

Table (3) show that the values recorded in non-pregnant Awassiewes were comparable however, those groups differed significant (p≤0.05) with the mean values recorded in the 5th month of pregnancyand early lactation groups. The lowest PCV value was recorded in 5th month pregnant group.

The results observed in the present study as represented in the Table (1) are accordance with findings of Mir, *et al*. (2008) who found that the total RBC count were significantly low (p≤0.05) during late pregnancy in comparison to non-pregnant where higher values were recorded in Awassi ewes. The reduction in the erythrocyte count in pregnant animals may be related to the physiological anemia occurring to hemodilution (Ozegbe, *et al*. 2001; Nuwayhid. 1979).

The high significant Hb concentrations were recorded in control Awassi ewes. These results agree with the findings of Mir, *et al* (2008); Hagawane, *et al* (2009). Who found that the Hb concentration decreased significantly was a consequences the advance of pregnancy until parturition and first month of lactation. The decrease in the content of Hb during pregnancy could be due to the dilution of blood which occurs as consequence of increase of plasma volumes (Singh, *et al*. 1991).

4-2-The effect of late gestation and early lactation on some biochemical parameters

4-2-1-Serum total protein concentration.

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Table (4)The serum total protein concentration (g/dl) in Awassi ewes during late gestation and early lactation. (Mean±SD).

The different large letters refer to significant differences at (p≤0.05) between groups in horizontal row.

Physical. State / Anima	non-pregnant (Control)	5th Month of gestation G2	1st month of lactation G3
Ewes	3.87±3.91C	4.30±1.37A	3.99±3.47B

Table (4) show that the serum total protein (STP) inAwassi ewes was significantly low (p≤0.05) in parturient cows while significant (p≤0.05) increase of total protein were recorded in 5th month pregnant ewes compared with control group, first month lactation groups . Also no significant differences was observed between first month lactation group and control.

Table (5)the serum albumin concentration. (g/dl)in Awassi ewes during late gestation and early lactation.(Mean±SD).

The different large letters refer to significant differences at (p≤0.05) between groups in horizontal row.

Physical. State / Animals	non-pregnant (Control)	5th Month of gestation G2	1st month of lactation G3
Ewes	**7.41 ±2.55 B**	**8.37±2.32 A**	**7.47 ±6.08 B**

Table (5) show that the mean albumin concentrations In Awassi ewes the significant (p≤0.05) increase in concentration of serum albumin was observed in 5th month pregnant ewes while the low significant (p≤0.05) concentration was observed in control (non-pregnant) and first month lactation cows.

Table (6) the serum globulin concentration (g/dl)in Awassi ewes during late gestation and early lactation. (Mean±SD).

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The different large letters refer to significant differences at (p≤0.05) between groups in horizontal row.

Physical. State / Animals	non-pregnant (Control)	5th Month of gestation G2	1st month of lactation G3
Ewes	**4.95 ±2.41B**	**4.52±1.63A**	**3.08 ±3.19B**

Table (6) show that the mean serum globulin concentration (g/L) in Awassi ewes a significant (p≤0.05) increase in blood serum globulin concentration was noticed in 5th of pregnancy compared with control (non-pregnant) and first month lactating ewes.

The results of the present study are shown in Table 4, 5 and 6 respectively. The mean TP concentration in the present work are in agreement with Mir, *et al* (2008) who all found that serum TP increased in late pregnancy (5th Month of gestation)compared with other stage of pregnancy and early lactation. The decreased serum TP was observed at parturition in sheep (Vihan&Rai, 1987), similarly as recorded in the present study. These changes in serum TP might represent an adaptive response to the higher need of water mobilization by blood to mammary glands for milk production. The significant reduction of the serum TP at parturition suggest to be occurred due to rapid leave of immunoglobins from the plasma during the last month of gestation when colostrums is being found in the mammary gland (Kaneko & Cornelius, 1980). As show in the Table 5 the mean values of the albumin in present study were significantly higher during last stage of pregnancy (5th month pregnancy ewes) and the low significant (p≤0.05) values were recorded in control non pregnant groups while the albumin values were significantly (p≤0.05) low in the parturient and first month lactating groups compared with 5th months pregnant groups in Awassi ewes. These results are in agreement with Piccione, *et al* (2009) who found that the serum albumin increased significantly (p≤0.05) during the late stage of gestation compared with dioestrus, pregnancy, post-partum and early lactation in ewes. However, Abdellatif, *et al.* (2009) showed a significant (p≤0.05) increase in albumin level during early flushing period and after mating compared with the values obtained

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during mid gestation while at parturition a significant increase ($p \leq 0.05$) in albumin in level as compared with the respective values obtained during late gestation in ewes.The results of globulin obtained in the present study as represented in Table (6) which showed that the low significant ($p \leq 0.05$) of globulin levels recorded in parturient and first month lactating cows and heifers groups when compared with control and other studied groups in both multiparous and heifers. Similarly Karapehlivana, *et al.* (2007) reported that significant ($p \leq 0.05$) decreases in globulin levels were recorded 3 week after drying off and on day 30 of lactation. While the plasma globulin levels were numerically higher in the mid pregnancy as compared with early and late stages of pregnancy in crossbred cows.

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