

Summary

This study was carried out to study the changes occurring in some biochemical parameters over the gestational in ewes and one week after parturition, as well as to evaluate clinical picture of pregnancy toxemia in ewes and alterations in serum biochemical parameters in ewes affected with pregnancy toxemia.

Thirty four pregnant ewes were used in the current study. The animals were assigned to two parts:

The first part: consist of twenty five ewes and divided into three groups:

Group A: nine ewes in fifth parity

Group B: eight ewes in the third parity.

Group C: eight pregnant heifers.

The other part: the pregnant ewes were divided into two groups:

Group I: consists of nine ewes suspected to be affected with pregnancy toxemia.

Group II: used the animals in group A in the first part as a control group.

The blood sample was obtained from each ewe via jugular vein puncture at approximately constant time (9 am o'clock) beginning at 4th week of pregnancy to the first week postpartum.

The results could be summarized as following:

I- Clinical examination:

The clinical examinations of ewes of the three groups revealed no apparent clinical abnormalities throughout the experimental period, while ewes suspected to be affected with pregnancy toxemia were suffering from anorexia, dullness and disincline to move. Temperature, pulse and respiration rates were in accordance with normal physiological ranges

II- Biochemical profiles:

Serum glucose levels, there were minor fluctuation throughout the experimental period in group A, B, C. With regard to parity serum glucose levels in group B were significantly lower ($p < 0.05$) than those recorded in group A and C. Additionally, the serum glucose levels in group A were higher than those in group B along the study period. In all groups, the serum glucose levels were within the normal physiological reference ranges.

There were significant marked drop in the serum glucose levels of suspected pregnant toxemic ewes (group I) than normal physiological limits as compared with those of control group (group II).

The serum insulin levels in all groups were fluctuated over the time of the experiment. Serum insulin concentrations in the ewes suspected to be affected with pregnancy toxemia were significantly higher ($p < 0.05$) than those in the control group.

Serum cholesterol levels were gradually dropped and reached the lowest value two weeks pre-partum in group A then gradually increases after parturition. In group B and C, the lowest level of serum cholesterol was recorded just after parturition (5th sampling time) (79.85 mg/dl) and (97.80 mg/dl) four weeks after mating (1st sampling time) respectively. The serum cholesterol levels were significantly lower ($p < 0.05$) in group A comparing with those in group B and C from 16 week of pregnancy to the first week after parturition . In all groups, the serum cholesterol levels were within the normal physiological reference ranges. The serum total cholesterol level in ewes suspected with pregnancy toxemia was significantly lower ($p < 0.05$) than that of healthy ewes at the 2nd week pre-partum.

Serum triglycerides in group B were significantly higher ($p < 0.05$) than those in group A and group C while, the serum triglycerides values in group C were significantly lower ($p < 0.05$) than those in group A and group B over the same periods. In all groups, the serum triglyceride levels were within the normal physiological reference ranges.

Serum level of triglycerides were significantly lower ($p < 0.05$) in ewes with pregnancy toxemia than in healthy ewes at the 2nd week prepartum (control group). Serum level of HDL-C and LDL-C fluctuated throughout the study in group A, group B and group C. In all groups, their levels were within the normal physiological reference ranges.

There was no significant change ($p < 0.05$) in serum high density lipoprotein-cholesterol (HDL-C) levels in suspected pregnant toxemic ewes as compared with those in control group, while there was significant decrease ($p < 0.05$) in serum low density lipoprotein-cholesterol (LDL-C) levels in suspected pregnant toxemic ewes as compared with those in control group.

The serum total protein level significantly fluctuated ($p < 0.05$) over the time of the study in all groups, but generally higher postpartum than pre-partum. In all groups, the serum total protein levels were within the normal physiological reference ranges and there were no any significant changes ($p < 0.05$) in serum total protein level between ewes suspected with pregnant toxemia and healthy ewes at the 2nd week pre-partum (control group).

There was insignificant fluctuation ($p < 0.05$) in the serum albumin concentrations along the study period in all groups of ewes but generally the concentrations were the highest at the 2nd week pre-partum in all groups. In all groups, the serum albumin levels were within the normal physiological reference

ranges. While serum albumin level in ewes suspected with pregnant toxemia was significantly lower ($p < 0.05$) than in healthy ewes at the 2nd week pre-partum (control group).

The serum globulin, urea and creatinine concentrations fluctuated along the course of the study in ewes of all groups and these concentrations were within the normal physiological reference ranges. While there were no significant changes ($p < 0.05$) between pregnant toxemic ewes and healthy pregnant ewes (control group).

The activities of serum AST in group B were significantly higher ($p < 0.05$) than those recorded in group A over the time of study, and than those recorded in group C in the 2nd, 4th, 5th and 6th sample collections. The activities of serum AST were within normal physiological range in sheep. In group B, the serum ALT activities were significantly lower ($p < 0.05$) than those recorded in group C in the 3rd, 4th and 5th sample collections but in 6th sample collections, the situation was reversed. The activities of serum ALT in all groups were within normal physiological range, while there was significant increase ($p < 0.05$) in serum AST and ALT activities in suspected pregnant toxemic ewes as compared with those in healthy pregnant ewes (control group).

The serum sodium, potassium and chloride levels fluctuated throughout the study in all groups of ewes and their levels were within the normal physiological reference ranges.

There was no significant change ($p < 0.05$) in serum sodium and chloride levels in suspected pregnant toxemic ewes as compared with those in healthy pregnant ones (control group), while there was a significant decrease ($p < 0.05$) in serum potassium levels in suspected pregnant toxemic ewes as compared with those in healthy pregnant ones (control group).

Serum Ca levels were fluctuated over the experimental period in group A, B and C. while ,the serum Ca levels were slightly dropped two weeks pre-partum (4th sample collection) in all animal groups . There were insignificant changes ($p < 0.05$) among the groups over the time of study. It is worth mentioning that the levels of total serum Ca and ionized Ca were lower than the normal physiological reference range. There was no significant change ($p < 0.05$) in serum calcium levels in suspected pregnant toxemic ewes as compared with those in healthy pregnant ones (control group).

The serum inorganic phosphorus levels significantly fluctuated throughout the study in all groups of ewes and with regard to the parities, no significant differences ($p < 0.05$) were observed in the serum inorganic phosphorus levels among the three groups along the period of study except a significantly reductions ($p < 0.05$) were observed between the group B and each of the group A and C in the 1st and 2nd sample collections (in the period extended from 4th to 8th month of pregnancy) and their levels were within the normal physiological reference ranges.

While there was a significant decrease ($p < 0.05$) in serum inorganic phosphorus levels in suspected pregnant toxemic ewes as compared with those in healthy pregnant ones (control group).

Conclusion

The stages of pregnancy as well as the number of parities affect some blood serum biochemical parameters during pregnancy in ewes e.g. blood glucose, insulin and lipid profiles, which can be used as indicators for the negative energy status in pregnant ewes.

Blood glucose, insulin and lipid profiles are not affected significantly during the early stage of pregnancy toxemia in ewes, so the treatment of the pregnant toxemic ewes must be started as quickly as possible regardless of the normal levels of glucose and insulin.

Clinical signs and blood glucose levels can be considered indicators for pregnancy toxemia in ewes during late pregnancy period as well as, blood serum cholesterol, triglyceride, AST, ALT, urea and creatinine may be used for diagnosis of clinical pregnancy toxemia in ewes.