



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2020; 8(5): 263-265

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Received: 12-07-2020

Accepted: 16-08-2020

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Effect of pregnancy on blood biochemical parameters in Assam hill goats

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Abstract

Present investigation was carried out to detect the effect of pregnancy in certain blood biochemical parameters on twenty (20) sexually matured Assam hill goats aged between 2 to 3 years. They were divided into two groups that is non-pregnant and pregnant group. Pregnant group was comprising of 15 animals with known gestational age, while 5 animals remained as cycling non pregnant. The blood was collected from the Jugular vein. The serum was separated by centrifuging at 3000 rpm for 15 min. The level of blood glucose, total protein, total cholesterol, creatinine, blood urea nitrogen along with liver specific enzymes like AST, ALT and mineral profile Calcium and Phosphorus were estimated. The mean serum glucose concentration in pregnant does was 46.54 ± 1.58 mg/dl, significantly lower ($P \leq 0.05$) than 58.78 ± 1.21 mg/dl for non-pregnant does. The mean serum cholesterol concentration in pregnant does was 80.08 ± 1.56 mg/dl, significantly higher ($P \leq 0.05$) than 64.33 ± 0.75 mg/dl for non-pregnant does. Total protein (g/dl), creatinine (mg/dl), Blood urea nitrogen (mg/dl), liver enzymes SGPT (U/L), SGOT (U/L), and mineral profile calcium (mg/dl) and phosphorus (mg/dl) remain unchanged that is there is no significant differences ($P \geq 0.05$) between the groups. The present study indicates that the pregnancy does not effect blood biochemical parameters except blood glucose and cholesterol in Assam hill goats.

Keywords: Assam hill goat, gestation, blood glucose, cholesterol, liver enzyme

Introduction

Goats are considered as ideal animals to keep due to their high ability to survive under severe conditions and due to their ability to produce high-quality meat and milk [12]. Goats are considered as one of the most important livestock. Goats are the dominant small ruminants that play a significant role in the rural economy of India. Biochemical profiles are important to be determined because they provide valuable information about the breed, age, sex, reproductive status, stress, transportation and sexual maturity [7, 12]. There is considerable information about the normal parameters of blood of the domestic animal species, but the values are expected to vary according to the breeds, different environmental factors and the different methods of management [11].

These differences have underscored the need to establish appropriate physiological baseline values for livestock which could be used in the realistic evaluation of the management practice, nutrition and diagnosis of health condition as well as in determining the physiological status of animals [1, 15].

This main objective of the present study was to observe the changes in blood biochemical parameters of pregnant and non-pregnant Assam hill goats across the gestation period.

Materials and Methods

A total of twenty (20) cyclic Assam hill goats aged between 2 to 3 years were selected for the experiment from nearby area of Khanapara, Guwahati. They were divided into two groups that is non pregnant and pregnant group. Pregnant group was comprising of 15 animals with known gestational age, while 5 animals remained as cycling non pregnant (control).

Collection of Blood

Blood samples were collected directly from jugular vein of all experimental goats under aseptic condition by using 15 gauge, 4 inches needle and transferred to 15 ml glass centrifuge tube. Then the tubes were centrifuged at 2000-3000 r.p.m. for 15 min. The serum was separated, kept in plastic vials and stored in deep freeze at -20°C for estimation of blood biochemical constituents. A fraction of blood was transferred to sterilize test tubes with

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anticoagulant NaF for blood glucose estimation. Blood glucose was estimated immediately after collection of blood.

Biochemical Analysis

The blood glucose level was estimated by Folin-Wu Method, 1920 [3]. Other blood biochemical constituents viz. Total Protein, Blood Urea Nitrogen, Creatinine, SGPT, SGOT, Cholesterol, Calcium and Phosphorus were estimated with the help of standard kit.

Results and Discussion

The result for some biochemical parameters of the non-

pregnant and pregnant Assam hill goats (does) at 4, 8, 12, 16 and 20 weeks are given in Table 1. The mean blood glucose concentration in pregnant does was 46.54 ± 1.58 mg/dl which was significantly lower ($P \leq 0.05$) than 62.78 ± 1.21 mg/dl for non-pregnant does. The mean serum cholesterol concentration in pregnant does was 80.08 ± 1.56 mg/dl, significantly higher ($P \leq 0.05$) than 64.33 ± 0.75 mg/dl for non-pregnant does. Other biochemical parameters like total protein (g/dl), creatinine (mg/dl), Blood urea nitrogen (mg/dl), liver enzymes SGPT (U/L), SGOT (U/L), and mineral profile calcium (mg/dl) and phosphorus (mg/dl) remain unchanged that means there is no significant differences ($P \geq 0.05$) between the groups.

Table 1: Values of Biochemical parameters (Mean \pm SEM) of non-pregnant and pregnant does at 4, 8, 12, 16 and 20 weeks of gestation

Parameters	Non Pregnant	4 Weeks	8 weeks	12 weeks	16 weeks	20 weeks
Glucose(mg/dl)	$62.78^a \pm 1.21$	$59.33^a \pm 1.19$	$59.21^a \pm 1.11$	$52.78^b \pm 1.02$	$49.33^c \pm 1.68$	$46.54^d \pm 1.58$
Total protein(g/dl)	6.38 ± 0.21	6.33 ± 0.19	6.42 ± 0.12	6.56 ± 0.43	6.49 ± 0.65	6.40 ± 0.76
Creatinine(mg/dl)	0.91 ± 0.43	0.85 ± 0.32	0.94 ± 0.33	1.01 ± 0.47	0.98 ± 0.92	0.95 ± 0.62
BUN(mg/dl)	16.57 ± 0.21	17.03 ± 0.86	16.45 ± 0.37	16.65 ± 0.76	16.72 ± 0.65	16.23 ± 0.87
ALT(U/L)	28.10 ± 1.56	28.90 ± 1.40	29.01 ± 0.76	29.31 ± 1.78	28.69 ± 1.43	28.73 ± 1.73
AST(U/L)	65.37 ± 2.74	66.23 ± 2.32	65.89 ± 1.01	65.98 ± 1.09	66.27 ± 1.11	65.33 ± 0.77
Cholesterol(mg/dl)	$64.33^a \pm 0.75$	$63.32^a \pm 1.59$	$64.53^a \pm 1.06$	$70.09^b \pm 0.90$	$76.71^c \pm 1.04$	$80.08^d \pm 1.56$
Calcium(mg/dl)	8.01 ± 0.34	9.07 ± 0.32	8.53 ± 0.27	10.24 ± 0.06	9.46 ± 0.46	10.96 ± 0.55
Phosphorus(mg/dl)	4.18 ± 0.56	4.65 ± 0.23	4.53 ± 0.41	4.34 ± 0.47	4.81 ± 0.67	4.70 ± 0.33

(Means bearing similar superscript do not differ significantly)

Discussion

In the present study, there is significant differences were noticed in glucose concentration between the pregnant and non-pregnant groups. Higher ($P \leq 0.05$) concentrations were observed in non-pregnant does than the pregnant does. The blood glucose can be used as indices of nutritional status during pregnancy in goats [6]. Highest in glucose immobilized by the use of adrenergic alpha-2 anesthetics, which inhibit the release of insulin and increase glucose output from the liver [13]. Insulin responsiveness was reduced during late pregnancy. During the pregnancy the output of adrenocorticotrophic hormones, glucocorticoids and adrenaline for breakdown of liver glycogen is increased [1]. The cholesterol levels of Assam hill goats were comparable to other breeds of goats [5]. The significant increase in the cholesterol level observed between 12 and 20 weeks of gestation is consistent with the previous reports of Sandabe and Starh [10, 14]. Cholesterol plays an important metabolic role as precursor of steroid hormones, bile acids, and some vitamins. Cholesterol has long been known to be regulatory in both female and male reproductive physiology, especially at the gonad level, also has an effect on gametogenesis [9]. The effects of pregnancy on SGPT and SGOT of the Assam hill goats were non significant ($P \geq 0.05$). It was almost similar in both non-pregnant and pregnant group. Serum SGPT has been recognized as a marker of hepatocellular injury. Numerous studies using carbon tetrachloride have clearly shown the value of serum ALT as an indicator of hepatocellular necrosis, especially in dogs and cats but to a much lesser extent in horses, cattle, swine, sheep and goats [2, 8]. The diagnostic sensitivity of serum SGOT activity in animals has been reported as 72% for hepatic necrosis and 100% for hepatic lipidosis [16]. Other biochemical parameters total protein, creatinine and blood urea nitrogen did not significantly differ between pregnant and non-pregnant does (Table 1). Mineral profile calcium and phosphorus concentrations were non significant between pregnant and non pregnant group. The requirements of Ca for pregnancy and lactation are higher than those for maintenance, foetus for skeletal formation and

for milk formation which increases the quantity of Ca required at tissue level and thereby increase Ca absorption from the gastro-intestinal tract [4].

Conclusion: The present study has indicated that the pregnancy does not effect blood biochemical parameters except blood glucose and cholesterol in Assam hill goats. Liver profile and mineral deficiency have not clinically affected during pregnancy of Assam hill goats when properly managed.

References

- Beitz DC. Protein and amino acid metabolism. In: Reece W. O. (ed.), Duke's physiology of domestic animals. Cornell University Press, Ithaca, 2004, 535-553.
- Everett RM, Duncan JR, Prasse KW. Alkaline phosphatase, leucine aminopeptidase, and alanine aminotransferase activities with obstructive and toxic disease in cats. American Journal of Veterinary Research. 1977; 38:963-966.
- Folin O, Wu H. A system of blood analysis. Supplement IA simplified and improved method for determination of sugar. Journal of Biological Chemistry. 1920; 41:367-374.
- Kadzere CT, Llewelyn CA, Chivandi E. Plasma progesterone, calcium, magnesium and zinc concentrations from oestrus synchronization to weaning in indigenous goats in Zimbabwe. Small Ruminant Reserach. 1996; 24:21-26.
- Kamalu TN, Shetty SN, Nair SG. Biochemistry of blood of West African Dwarf goats. Tropical Veterinarian. 1988; 6:2-5.
- Khan JR, Ludri RS. Changes in blood glucose, plasma non-esterified fatty acids and insulin in pregnant and non-pregnant goats. Trop Animal Health Production. 2002; 34(1):81-90.
- Madan J, Sindhu S, Gupta M, Kumar S. Hematobiochemical profile and mineral status in growing beetal goat kids. Journal of Cell Tissue Research. 2016; 16:5517-5522.

8. Noonan NE. Variation of plasma enzymes in the pony and the dogs after carbon tetrachloride administration. *American Journal of Veterinary Research*. 1981; 42:674-678
9. Saez F, Ouvrier A, Drevet JR. Epididymis cholesterol homeostasis and sperm fertilizing ability. *Asian Journal of Andrology*. 2011. 13:11-17.
10. Sandabe UK, Mustapha AR, Sambo EY. Effect of pregnancy on some biochemical parameters in Sahel goats in semi-arid zones. *Veterinary Research Communication*. 2014; 28:279-285.
11. Sharma AK, Kataria N. Influence of season on some serum metabolites of Marwari goats. *Indian Journal of Small Ruminants*. 2012; 18:52-55.
12. Silanikove N. The physiological basis of adaptation in goats to harsh environments. *Small Ruminant Research*; 2010; 35:181-193
13. Soveri T, Sankari S, Salonen JS, Nieminen M. Effects of immobilization with medetomidine and reversal with atipamezole on blood chemistry of semi-domesticated reindeer (*Rangifer tarandus tarandus* L.) in autumn and late winter. *Acta Veterinaria Scandinavica*., 1999; 40:335-349.
14. Starh HM. *Analytical Toxicology Methods Manual*, 1st ed. Iowa State University Press, Iowa, 1977, 249-265.
15. Waziri MA, Ribadu AY, Sivachelvan N. Changes in the serum proteins, hematological and some serum biochemical profiles in the gestation period in the Sahel goats. *Vet Archives*, 2010. 80:215-224.
16. West HJ. Evolution of total plasma bile acid concentrations for the diagnosis of hepatobiliary diseases in horses. *Research in Veterinary Science*. 1989; 46:264-270