مقارنة توزيع محتويات مصل الدم وبلازما السائل المنوى من الترانس أمينازيس والكوليستيرول لبعض حيوانات المزرعة فى مصر

ع. عبد المطلب ، م . النجار

أجريت دراسة مقارنة محتويات مصل الدم وبلازما السائل المنوى من الترانس أمينازيس والكوليستيرول الكلى لذكور الجمال ، الجاموس ، الأبقار الكباش.

أوضحت الدراسة أن مصل الدم وبلازما السائل المنوى للكباش يحوى أعلا قيم أنزيم GOT بينما السائل المنوى لذكور الجمال والجاموس يحوى أعلا قيم GPT . يحتوى المصل وبلازما السائل المنوى لذكور الأبقار على أعلا قيم للكوليستيرول الكلى .

Depts. of Med. and obst. Gynaec. and A.I.
Faculty of Vet. Med. Assiut University,
Heads of Depts. Prof. Dr. Prof. Dr. S. El-Amrousi

COMPARATIVE DISTRIBUTION OF TRANSAMINASES AND TOTAL CHOLESTEROL CONTIENT OF THE BLOOD SERUM AND SEMINAL PLASMA OF SOME EGYPTIAN FARM ANIMALS

(With One Table)

By

A.A. MOTTELIB, and M.A. EL-NAGGAR

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SUMMARY

A comparison was made of transaminases and total cholesterol in the seminal plasma and blood serum of male camels, buffalo bulls, native breed bulls and rams. High values of GOT were observed in the serum and seminal plasma of rams,while the highest activity of GPT was found in the seminal plasma of camel and buffalo bulls. The highest cholesterol level was in the serum and seminal plasma of the native breed bulls.

INTRODUCTION

The two clinically important transaminases are glutamic oxalacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT).They have a wide distribution in animal tissues and are present in small quantities in the serum of all animals as a result of normal tissue destruction and subsequent enzyme release (COLES, 1967). In the last twenty years, many reports have been published about the use of these enzymes in the early diagnosis of cellular injury (KNAPP et al., 1965).

In man,the male accessory secretions have been shown to be a source for transaminases in the seminal plasma (MANN, 1964).

Cholesterol, a derivative of the cyclopentanoperhydrophenanthrene ring, is a necessary step in the chain of biological synthesis of male and female sex hormones (MANN, 1964 and HALL et al., 1969).

The sites of cholesterol synthesis are almost ubiquitious in the body; thus,with the possible exception of adipose tissue and adult brain tissue (COLES,1967),almost every organ or tissue that has been carefully examined by a sensitive technique has been found capable of cholesterol synthesis (MEDWAY et al., 1969). The liver is the only organ that supplies a significant amount of cholesterol to the plasma and hence serves as the actual source of the cholesterol (MEDWAY et al., 1969). The interstitial cells of the testes as well as the cells of all segments of the male genital tract are suggested sites for cholesterol formation (HALL et al., 1969). SEAMARK and WHITE (1963) reported that the lipids of the human seminal plasma originate chiefly from the prostatic fluid.

The present study was planned to compare the normal level of transaminases activity and the total cholesterol content of the blood serum and seminal plasma in male camels, buffalo bulls, native breed bulls and rams.

MATERIALS AND METHODS

This investigation was carried out on serum and seminal plasma callected by the usual methods for giving semen samples for said male dromeadary camels, buffalo bulls, native breed balady bulls and Ossimi rams. All aminals were clinically normal. Samples were taken during the green season.Serum and seminal plasma were obtained by centrifugation of whole blood and semen respectively. All animals were mature and the age regee was not considered.

GOT and GPT activities were determined by the method of REITMAN and FRANKEL (1957) and total cholesterol by the method of PEARSON et al., (1953). The reagents used in these determinations were in the form of test kits supplied by Merck, Darmstadt, West Germany. The data were statistically analysed to obtain mean values and standard deviations (SNEDECOR and COCHRAN, 1967)

RESULTS

The results are presented in Table 1. In all the animals, it is evident that the normal activity levels of both GOT and GPT were much higher in the seminal plasma than in the blood serum. In contrast, the total serum cholesterol was higher than that in the seminal plasma of the corresponding animal. Wide variations were observed in the cholesterol content of both fluids. The highest value was in serum and seminal plasma of the native bulls and the lowest levels were in both these fluids of the rams.

DISCUSSION

The activities of GOT and GPT in the seminal plasma of the native breed bulls were slightly lower than those reported by FLIPSE (1960) and HANKIEWICZ et al., (1964). FLIPSE (1960) found that the GPT level in the seminal plasma of bulls was the same as in blood serum. A high level of GOT has been reported in the semen of man and rabbit; in human seminal plasma the concentration of the enzyme was approximately 10-20 times greater than that of serum (ELIASSON, 1966). The highest level of GOT activity was found in seminal plasma of the rams. On the other hand, the seminal plasma of the camel and buffalo bulls had higher values of GPT. The activity of this latter in the seminal plasma of the buffalo bulls is very similar to that found by CHAUHAN and SRIVASTAVA (1973), while their values for GOT were very variable.

For the native Balady bulls, the transaminases activites (GOT and GPT) of the seminal plasma were in accord with those quoted by GLUHOVSCHI et al., (1967). HANKIEWICZ et al., (1964), were of the opinion that the transaminases in bulls had no association with age, race, potency or physical properties of the semen. There is some evidence that the high transaminase activity of the seminal plasma may enable the carrying out of alanine pyruvate conversion. FLIPSE and BENSON (1957) demonstrated a significant uptake and utilization of glycine by bull spermatozoa.

The level of total cholesterol in both fluids agrees with the findings of MORRIS and COURTICE (1955) in rams, of GLUHOVSCHI, et al., (1965) and EL-GHANNAM (1972) in bulls; and of EL-GHANNAM and EL-AMROUSI (1972) in buffalo bulls.

Although PRABHU et al., (1973) reported rather similar figures for the total cholesterol content in the seminal plasma of Kankrej bulls, their findings for Surti buffalo bulls were markedly lower than our results.

Higher values for the total cholesterol content of the serum of the one-humped camel were observed by BARAKAT and ABDEL-FATTAH (1970). FurTHERMORE, BARAKAT and ABDEL-FATTAH (1971) found a wide variation in the total cholesterol content of the male camel serum, from 96.38mg% in the dry season to 119.20 mg% in the green season; these findings do not agree with our results which were much lower. Very similar findings to our own were given by KHAN (1971) for the total cholesterol content of the blood serum of the male camel in India during the rutting season (average, 65.58% mg%, range 49.8 to 85.3 mg%). He also mentioned that a highly significant increase in serum cholesterol was observed during rutting. Publications on the level of cholesterol in the seminal plasma of the camel are lacking. The differences in cholesterol content might be due to differences in age, breed, ration and genetic constitution and also to the season of semen collection (COLES, 1967). In the latter connection, MASAKI and TOMIZUKA (1966), observed seasonal variations in the content of sperm phospholipids and glycerylphosphorylcholine in bull semen.

In the present study, although the cholesterol level of both the serum and seminal plasma of the camel was nearly the same as that of the ram, it was much less than that in the native Balady bulls or in buffalo bulls. EL-GHANNAM (1972) showed that the cholesterol level was significantly higher in the seminal gland secretion than in the ampullar secretion of the mature native bulls. He further concluded that the vesicula

seminalis plays the main role in the activity of cholesterol biosynthesis in the male qenital tract. In the camel, however, the satuation varied where the ampulla, prostate or testes must be considered as possible sources of cholesterol biosynthesis, since the seminal glands are absent in the camel (TAYEB, 1946).

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Table (1): Transaminase and Cholesterol Comtent of Seminal Plasma and Blood Serum of Camels, Buffalo Bulls, Mative Breed Bulls Rams.

Parameters	Camels		Buffalo bulls		Native breed bulls		Rams	
	Sem. Pl.	Bl. Serum	Sem. Pl.	Bl. Serum	Sem. Pl.	Bl. Serum	Sem. Pl.	Bl. Serum
GOT	51.2±11.5	47.9±7.8	61.9± 6.9	39.1± 3.1	66.9± 2.6	48.7± 3.4	67.3± 6.6	57.6± 7.6
(mU/ml)	25.0-73.0	39.7-65.0	47.0-65.0	32.0-45.0	62.0-73.0	45.0-60.0	48.0-77.0	47.0-80.0
GPT	18.5± 7.2	17.0± 3.7	31.6± 4.1	3.13± 1.2	13.9± 2.1	5.5±0.82	8.1±0.63	6.7± 2.7
(mU/ml)	00.0-43.0	6.0-39.0	23.0-45.0	4.0 -10.0	10.0-22.0	4.0-8.0	2.0-16.0	3.0-10.5
Total	46.1±11.7	72.1±12.5	115.5±19.2	123.14±16.7	127.2±15.4	140.28±14.6	32.3±9.8	62.9± 6.8
Cholesterol mg%	30.0-88.0	43.0-110.0	34.0-215.0	124.0-254.0	73.0-162.0	90. 0-192.0	15.0-66.0	44.0-87.0
Number of	35	28	30	26	27	35	44	40

± = Standard Deviation.