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بعض مستويات الأنزيمات فى مصل الأبقار والجاموس وعلاقتها بنشاط المبيض

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استخدم فى هذا البحث عدد ٤٩١ عينة سيرم جمعت من السلخانة ومن الجاموس الحـــــى (عجلات وأبقار) وكذلك من العجلات البقرى البلدية سواءا كانت ذات نشاط مبيضى طبيعـــــى أو تعانى من خمول المبايض . وقد تم تعيين مستوى كل من أنزيم الجلوتاميك اوكسال ترانس أمينيز والا وكسال بيرفوك أمينيز وكذلك أنزيم الفوسفتيز القاعدى . وقد اتضح أن هناك زيادة معنوية فى فى مستوى الأنزيم الأول والثانى فى مصل الحيوانات التى تعانى من خمول المبايض عن الحيوانات طبيعية نشاط المبايض والعكس صحيح بالنسبة لانزيم الفوسفتيز القاعدى كذلك لم توجد أى فروق معنوية فى مستوى الأنزيمات التى درست أثناء مراحل الشبق المختلفة .

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SOM SERUM ENZYMATIC LEVELS IN RELATION TO OVARIAN FUNCTION IN COWS AND BUFFALOES

(With 5 Tables)

By

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SUMMARY

A total of 370 blood samples were collected from slaughtered and living fertile and infertile buffalo-cows, buffalo heifers and native cattle heifers. SGOT, SGPT and SAP were determined in each sample.

The obtained results showed that animals with completely inactive ovaries possessed a significantly (P / 0.05) higher SGOT and SGPT values than those with questionable activity or normally active ovaries (Estrus or Diestrus). In regard to SAP, the reverse was true. However, non of the studied enzymes showed significant deviation during the phases of the oestrus cycle.

INTRODUCTION

Blood analysis generally reflects the animal health and the state of metabolism. The activity of serum transaminases and alkaline phosphatase was found to be affected by the reproductive cycle, growth and fattening (SMARNOV, 1974 and GRAF, 1977). The two clinically imported transaminases are glutamic oxalacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT), have a wide distribution in the 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).

However, a number of reports have been published about the use of these enzyme tests on animals. These are important in the early diagnosis of cellular injury, whether the damage is caused by disease or acute poisoning (WROBLESKI and LA DUE, 1955; KING and WOOTON, 1959; KAMALYAN, ABRAMYAN, MNATSARYAN and BUNIATRYAN, 1969 and HOFMANN and EL-AMROUSI, 1974).

No author, has ever engaged himself in the study of the cyclic changes in the enzymatic activity of the blood serum in relation to ovarian function in cows or buffaloes. This was a great stimulus to the authors to study the variation of the blood serum level of some enzymes during the estrus cycle as well as in cases of inactive ovaries in our native breed cows and buffaloes.

MATERIAL and METHODS

The material used in this investigation includes:

A- Slaughter-house material:

A total of 192 non-pregnant genitalia of buffalo-cows (ranging in age from 6 to 12 years) were collected from EL-MOTEA slaughter-house, Assiut, Egypt. A blood sample from each animal was taken before slaughter. All included animals were healthy.

B- A total of 167 fertile and infertile buffalo heifers and buffalo cows were studied in this part. Before blood sampling, rectal examination was performed twicely at 7-10 days interval to give accurate diagnosis for the incidence of ovarian inactivity.

C- Eleven native cattle heifers ranged in age from 1.5-2 years were used. These animals were kept as a group stationary clinic of the Faculty of Veterinary Medicine, under the same environmental condition of nutrition and management. From each animal, blood sample was collected, six times during the green season and six times during the dry season.

We have adopted the classification reported by EL-SAWAF and SCHMIDT (1962) with regard to the activity of the ovaries.

Clear serum was obtained by centrifugation of the blood. GOT and GPT were determined according to the method of REITMANN and FRANKEL (1957).Alkaline phosphatase was determined by the method of BELFIELD & GOLDBERG (1971), modification of KING and KING procedure (1954).

The reagents used in these determinations were in the form of test kits supplied by Merk, Darmstadt, West Germany.

The data were statistically analysed according to SNEDECOR (1967).

RESULTS

Results of the SGOT, SGPT and SAP are presented in Tables (1-5).

In all studied material, SGOT, SGPT values obtained for animals with complete ovarian inactivity were significantly (P / 0.05) higher than those with questionable ovarian activity and (P / 0.01) significantly more higher than those with cyclic ovarian changes (Estrus or Diestrus).

On the other hand, the values obtained for SAP in normal cycling animals were significantly (P / 0.05) higher than those obtained for animals with questionable activity or complete ovarian inactivity.

Values obtained for the three enzymes in buffalo heifer, were higher than those obtained for the buffalo-cows (Tables 2 & 3). In native cattle heifers (Tables 4 & 5), the SGOT and SGPT are decreased, while SAP is increased during the green season than during the dry season.

Non of the studied serum enzymes showed significant deviation during estrus cycle.

DISCUSSION

The obtained results showed that animals with completely inactive ovaries possesed serum GOT and GPT which is significantly (P / 0.05) higher than those with questionable activity and normally active ovaries. This agrees to a large extent with the statement of COLES (1967), that the serum activity of the two enzymes are increased in cases of starvation. This will lead to mobilization of fat from its depots as a source of energy and consequently, the release of the two enzymes. The probable cause for such high value of SGOT and SGPT activity in these animals is the malfunctioning of the liver (MOLANER, WROBLEWSKI and LA DUE, 1960; WROBLEWSKI and LA DUE, 1965; COLES, 1967; LOTTHAMMER, BENTEN and EL-NAHAS, 1971 and WETTKE and JOSN, 1971).

SOMMER, 1975, concluded that nutritive differneces such as imbalance in proteins and carbohydrates or insufficient crude fiber content, results in upsetting the proper function of the rumen, which will cause more or less harmfull energetic deficiency and damage of the liver. He further added that most of the quantitative nutritive deficiencies can easily lead to liver affections which can be measured by means of GOT analysis.

However, the serum alkaline phosphatase activity (SAP) were found to be higher (P / 0.05) in animals with normally active ovaries than those with questionable activity or complete inactivity. This agrees with the finding of KANEKO and CORNELIUS (1967). This is confirmed with the statement of HIGNETT, 1941,1960; LAING,1970; ROBERTS, 1971 and FARRAG, 1978, that undernutrition plays an extremely important role in bovine infertility.

In all studied material, non of the three enzymes showed significant deviation during oestrus cycle. Unfourtunatelly, the available literature lacks any data concerning the serum enzyme activity during oestrus cycle, thus we are not in a state for comparing our results.

Moreover, in native cattle heifers, the SAP activity increase, while SGOT and SGPT activity are decreased during green season and the reverse is true during the dry season. This comes in agreement with COLES, 1967 and KANEKO and CORNELIUS, 1967. Such results must be expected since Barseem is available and provided to animals in large quantaties, with subsequent improve the general health condition of animals the green season.

Table (1): Serum enzyme activity and ovarian function in buffaloes (Slaughterhouse material)

Cond. fo the ovaries	No. of animals	SGOT	SGPT	SAP
Estrus	39	40.75±2.18 (34-62)	9.44±2.3 (7-18)	29.42±0.8 (25-32)
Diestrus	73	39.44±1.91 (23-40)	9.06±1.5 (7-14)	30.1 ±2.1 (26-35)
Average	112	40.1 ±3.12 (23-62)	9.25±1.61 (7-18)	29.76±1.9 (25-35)
Questionable	27	42.88±1.95 (40-23)	11.01±1.9 (9-16)	29.2 ±0.8 (26-32)
Static Ovaries	53	45.25±3.56 (38-80)	12.6 ±2.1 (9-17)	26.82±1.1 (32-29)

Table (2): Serum enzyme activity and ovarian function in buffalo cows.

Cond. of the ovaries	No. of animals	SGOT	SGPT	SAP
Estrus	16	42.52±6.21 (24-56)	11.0±1.4 (8-16)	34.6 ±1.3 (29-37)
Diestrus	21	41.13±7.13 (24-58)	9.6±2.6 (7-18)	33.29±0.07 . (29-35)
Average total	37	41.82±5.40 (24-58)	10.3±1.00 (7-18)	33.95±2.2 (29-37)
Static Ovaries	50	44.04±5.03 (22-52)	13.9±1.22 (9-16)	29.00±1.8 (25-34)

Table (3)

Serum enzyme activity and ovarian function in bufalo-heifers

Cond. of the ovaries	No. of animals	SGOT	SGPT	SAP
Estrus	17	45.21±3.01 (34-50)	10.4 ±1.6 (8-17)	32.9 ±3.1 (26-38)
Diestrus	28	43.29±9.37 (28-54)	12.01±1.01 (10-15)	33.5 ±2.6 (26-40)
Average Total	45	44.25±3.28 (28-54)	11.21±0.91 (8-17)	33.2 ±2.9 (26-40)
Static	35	46.15±4.61 (36-52)	13.89±0.09 (12-15)	30.22±2.3 (26-35)

Table (4): Serum enzymes activity and ovarian function in native cattle heifers (dry season).

Cond. of the ovaries	No. of animals	SGOT	SGPT	SAP
Estrus	13	42.76±5.64 (36-60)	14.0 ±0.6 (13-16)	28.01±0.9 (25-32)
Diestrus	32	39.21±2.19 (30-48)	13.5 ±1.3 (11-17)	33.01±3.2 (26-40)
Average	36	40.99±6.13 (30-60)	13.75±1.2 (11-17)	30.51±2.8 (25-40)
Static Ovaries	6	43.11±3.17 (35-46)	15.2 ±1.9 (9 -17)	27.14±1.5 (23-30)

Table (5): Serum enzymes activity and ovarian function in native cattle heifers (Green season)

Cond. of the ovaries	No. of animals	SGOT	SGPT	SAP
Estrus	18	38.48±4.89 (24-58)	11.55±2.1 (19-22)	34.9 ±1.6 (25-37)
Diestrus	20	37.51±6.21 (22-52)	10.21±1.1 (8-16)	33.1 ±2.4 (25-42)
Average	38	38.00±6.96 (22-58)	10.88±0.87 (8-22)	34.00±1.68 (25-42)
Static Ovaries	6	42.01±3.19 (29-48)	14.2 ±1.8 (12-19)	30.01±2.2 (25-42)

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