أقســـــــام : الأمراض الباطنة ، الولادة ، الانتاج الحيوانى .
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دراسة على التغييرات فى نشاط انزيمات سيرم الدم وكـــذا صورة الدم فى الجاموس قبل وبعد الولادة

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تم دراسة التغييرات الانزيمية (الترانس اميزس والالكلين فوسفاتيز) وكذا الصورة الدموية (الخلايا الحمراء ـ الهيموجلوبين ـ الهيماتوكريت ـ الخلايا البيضاء ـ ليمفوسيت ـ نيتروفيـــل فى الجاموس المصرى فى الفترة قبل الولادة بشهر وبعد الولادة بشهر ونصف . وقد ثبت بالفحص أنه قد حدث زيادة فى مستوى الترانس أميزس والالكلين فوسفاتيز قبل الولادة وكان ذلك مصحوبا بنقص فى قيم صورة الدم . أما بعد الولادة فقد حدث نقص فى مستوى انزيمات الدم المشار اليها سابقا وكان ذلك مصحوبا بزيادة فى قيم صورة الدم حتى وصلت تقريبا الى مستوى القيم الخاصـــة بحيوانات المجموعة المقارنة (الخالية من الحمل وجافة من اللبن) بعد ستة أسابيع من تاريـــخ الولادة .

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ENZYMATIC AND HAEMATOLOGICAL STUDIES ON BUFFALOES AT PERIPARTURIENT PERIODS

(With One Table)

By

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(Received at 4/5/1982)

SUMMARY

The serum enzymatic activity (S-GOT, S-GPT and S-AP) and the haematological changes (RBCs, PCV, WBCs and differential leucocytic count) of 30 Buffaloes were determined from the last 4 weeks of pregnancy to the 6th week after parturition. Further 17 non lactating buffaloes were considered as a control group. The enzymatic activity were found to increase with the advance of pregnancy especially during the last week, while the haematological changes showed decreasing values. After parturition the enzymatic activity decreased while the haematological values increased till they approach the values of the control group after 6 weeks post parturition.

INTRODUCTION

Pregnancy and parturition constitute two of the main physiological events that occure in females during reporductive life. During pregnancy, the foetus depends entirely upon its dam for the supply of nutreint (ARTHUR, 1964). Furthermore, after parturition, the formation of the colostrum and the beginning of lactation, constiture a heavy load upon the bloddy constituents. Much informations are available in the literature concerning the levels of various elements in teh blood at the periparturient period of cattle, e.g. Ca, Na, K. and P (GERALD, BLOSSER and ADAMS; 1952 and THOMPSON and POMMERENKE; 1963), and Ca, Mg, P, glucose and protein (El-NAGGAR; 1975). The activity of serum transaminases and alkaline phosphatase as affected by pregnancy and parturition were studied by BOSTEDT (1974) and SALEM, MOTTELIB and ABDEL-HAFIZ (1979). The authors noticed some elevation in these enzymes before parturition which significantly decreased after parturition and during lactation. Incormation about the enzymatic and haematological changes shortly before and after parturition in our Egyptian buffaloes are still not available. The aim of the present investigation was directed to study the enzymatic and haematological changes at periparturient periods in Egyptian buffaloes.

MATERILA and METHODS

This study was conducted on 47 buffaloes belonging to the farm of the faculty fo agriculture, Assiut Univ., The age of the animals ranged from 3-7 years. Thirty animals were studied during the periparturient period i.e. 4 weeks before and 6 weeks after parturition, while the rest of the animals (17 buffaloes) were non pregnant-non lactating buffaloes which served as a control group. Rectal examination of the control animals revealed that they were normally cycling animals (5 animals were in the oestrous phase of the cycle, and the rest i.e. 12 animals were in the dioestrous phase). All the animals were free from internal parasite, tuberculosis and Brucellosis, and all were under the same environmental and nutritional conditions. The stage of pregnancy was determined from the breeding records as well as by rectal examination.

Two blood samples were collected from each animal from teh jugular vein at weekly interval in the periparturient periods (4 weeks pre and 6 weeks post parturition). An anticoagulated blood samples were used for the quantitative determination of RBCs, Hb, PCV, WBCs, lymphocytes and neutrophiles (COLES; 1980). Serum was separated from the whole blood samples and used to estimate the enzymatic activity. The serum transaminases (S-COT & S-GPT) were determined according to the method of REITMAN and FRANKEL (1057), while the alkaline phosphatase (S-AP) was determined by the method of BELFIELD and GOLDBERG (1971) which is a modification of the kind and king Procedure (1954). The obtained data were analysed after SNEDACORE and COCHRAN (1967).

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RESULTS

The results of the enzymatic and haematological analysis of buffaloes in the periparturient periods as well as in the non pregnat-non lactating control group are presented in Table 1. The data obtained during the prepartum period showed variable significant differences (levels from 1-5%) from those of non-pregant non-lactating group.

DISCUSSION

Our study in the non pregnant-non lactating buffaloes, revealed that, the erythrocytic count, haemoglobin content and haematocrit values, were in average of $6.6 \pm 0.43 \times 10^6/mm^3$, 13.1 ± 1.3 gm/100 ml and $40 \pm 1.70\%$ respectively. During the four weeks before parturition, there were flactuations decreasing towards parturition. One week before parturition, the level dropped to a minimum mean values of $5.1 \pm 0.63 \times 10^6$ RBCs/mm^3, 10.1 + 0.81 gm/100 ml for Hb and $37.0 \pm 0.32\%$ for haematocrit. After parturition these values start to increase gradually untill they reach at 6th week post parturition nearly to the levels obtained in non pregnant-non lactating buffaloes. Our findings agree, in general, with those reported by MORRIS (1944) in cows. Moreover, the picture obtained in this study is typical to that of mild response to stress reported by SHALM (1961).

As regards to the count of leucocyte and the persantages of lymphocytes and neutrophyles (Table 1), the obtained data indicated the occurance of a mild leucopenia with lymphopenia and neutropenia before parturition. After parturition these changes starting to return again to the levels obtained from the non pregnant-non lactating group. These changes can be explained by the excessive production of ACTH before parturition (WALKER, 1964). However, such hormone is also responsible for lympholysis and hinder the lymphopiosis (SHALM, 1961).

The serum transaminases S-GOT and S-GPT in the non pregnant-non lacating buffaloes, were found to average 28.9 ± 3.90 mu/ml and 16.33 ± 4.20 mu/ml, respectively. In the pre parturition period, these enzymes and a tendency for incressing towards parturition reaching their maximum reaching their maximum at the last week before parturition (58.3 ± 3.9 mu/ml for S-GOT and 24.2 ± 2.2 mu/ml for S-GPT). Our findings agreed with the data of SALEM, et al. (1979) and BOSTEDT (1974). The increase of both enzyme activities (S-GOT & S-GPT) during the last period of gestation is the result of increasing the foetus requirements to synthesis new tissues where both enzymes are necessary for accelerating the rate of metabolism and perotein biosynthesis needed for foetal frowth (SALEM et al. 1979 and BOSTEDT, 1974).

The serum AP activity was found to average 14.90 ± 1.30 mu/ml in the non pregnant-non lactating buffaloes. The pre parturition period (4 weeks before parturition) revealed an increased serum AP activity towards parturition, then the activity decreased gradually after parturition. Similar findings were obtained by SALEM, et al. (1979) in buffaloe, BOSTEDT (1974) and WALKER (1964) in cattle. The increase of serum AP activity during the pre partum period can be considered as a function of the osification process in the foetus (BOSTEDT, 1974).

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Table (1)

Enzymatic and haematological picture during the periparturient periods in buffaloes

Criterium	Prepartum period (in weeks)				Post partum period (in weeks)						Non pregnant non lactating animals (control)
No. of the week	4	3	2	1	1	2	3	4	5	6	
RBCs ($x10^6/mm^3$)	642.	5.8	5.5*	5.1*	5.3	5.9	6.1	6.2	5.9	6.3	6.60
	±0.53	0.32	0.35	0.63	0.52	0.33	0.35	0.42	0.33	0.22	0.43
Hb (gm/100 ml)	12.9	12.0	11.1*	10.1*	10.3*	11.1	11.9	11.8	12.0	12.9	13.10
	±0.71	0.37	0.54	0.81	0.43	0.32	0.35	0.39	0.24	0.93	1.30
PCV (%)	39.0	38.0	39.0	37.0*	37.8	38.1	38.1	39.0	39.4	39.3	40.00
	±1.33	0.42	0.33	0.32	0.37	0.99	0.33	1.10	1.39	1.3	1.70
WBCs ($x10^3/mm^3$)	8.1	7.3*	7.2*	7,1*	8.1	7.9	10.1	9.9	9.1	9.5	9.24
	±1.2	1.30	0.90	1.20	1.88	0.93	1.99	1.10	1.88	1.10	1.3
Lymphocytes %	50.33*	52.33*	47.2*	48.3*	55.22	55.2	58.9	58.3	60.9	61.1	60.30
	±3.2	3.2	3.5	4.4	3.2	3.1	2.2	2.1	3.9	2.3	3.3
Neutrophiles %	39.1*	39.1*	41.3*	41.2*	36.1	36.2	33.2	33.1	30.9	29.9	31.20
	±2.2	4.1	2.3	1.3	3.2	4.1	2.1	3.1	3.4	2.9	3.2
S-GOT (mu/ml)	55.9*	48.9*	59.3**	58.3**	35.3*	27.3	27.2	28.3	20.3	22.3	28.90
	±3.2	2.2	4.2	3.9	2.1	2.1	3.3	3.2	1.2	2.3	3.90
S-GPT (mu/ml)	19.3*	18.3*	23.3*	24.2**	17.3	15.3	16.3	17.2	13.9	12.3	16.33
	±2.2	1.9	1.3	2.2	1.3	1.0	1.1	2.1	1.9	1.1	4.20
S-AP (mu/ml)	17.3*	27.9*	27.3*	28.3**	16.3	12.9	18.3	17.1	17.33	16.3	14.90
	±1.2	1.1	3.1	1.1	1.2	3.1	0.99	1.2	2.2	1.1	1.30

Mean ± Standard Error

* Significant at 5% level

** Signicicant at 1% level