

قسم : الولادة والتلقيح الصناعي .
كلية : الطب البيطرى - جامعة أسيوط .
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دراسات على حمى اللبن في الجاموس المصرى

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تم في هذا البحث دراسة التغيرات الكيميائية لسيرم الدم في الجاموس المصرى المصاب بحمى اللبن - وقد ثبت بالفحص حدوث نقص معنوى فى الكالسيوم والفوسفور وكذا البروتين ، وصاحب ذلك حدوث زيادة ملحوظة فى كل من الصوديوم والبوتاسيوم والترانس أمينيزس والفوسفاتيز القاعدى ، وكذا الكلسترول وكان ذلك بالمقارنة لقيم مجموعة الكنترول من الجاموس بعد الولادة الطبيعية .

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**SOME SERUM BIOCHEMICAL ASPECTS ASSOCIATED
WITH PARTURIENT PARESIS IN BUFFALO COWS IN UPPER EGYPT**
(With one table)

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(Received at 6/9/1982)

SUMMARY

The serum samples of 19 paretic buffaloes and 21 of normal delivery buffaloes were chemically analysed. The sera of the affected buffaloes revealed a significant decrease in the calcium, inorganic phosphorus and the total protein ($P/0.01$). These were accompanied by a significant increase of sod., pot., S-GOT, S-GPT, S-AP, cholesterol and Glucose ($P/0.01$).

INTRODUCTION

One of the major problems in the dairy cattle practice is the parturient paresis in which the animal characterised by changes in neuromuscular tone ranging from fine muscle tremors to paresis recumbency and coma (FENWICK, 1969 and JOHNSON, 1963). The disease in dairy cows has been and is still the subject of intensive research. Investigations were mainly concerned with the serum biochemical changes (BLUM; RAMBERG; JOHNSON and KRONFELD, 1972; EL-AMROUSI and HOFFMANN, 1972; HOFFMANN and EL-AMROUSI, 1970; NILSON, 1960 and GERALD, BLOSSER and ADAMS, 1952) as well as the pathogenesis and the aetiology of the disease (PAYNE, 1967 and STOTT and VEARL, 1957). In fact the diagnosis of parturient paresis which based entirely on the clinical signs and hypocalcaemia is used to distinguish parturient paresis from some other disorders occurring after parturition in cows (ROSENBERGER, 1958). In the available literature there is no informations about parturient paresis in buffaloes. The present paper gives informations about some serum biochemical changes that associate parturient paresis in buffalo cows.

MATERIAL and METHODS

This investigation was carried out on 19 buffaloes which manifested the clinical picture of post partum recumbency. For comparison a second group of 21 normal postpartum Egyptian buffalo cows were also included. Animals were chosen from El-Hawatka dairy farm at winter of 1981-1982. In both groups blood samples were obtained 6-12 hours, after clinical signs of paresis and before treatment in the diseased group and after normal parturition in the control group. Sera were separated from the whole blood samples and were used to estimate sod. & pot. by means of flame photometer, inorganic phosphorus and calcium (ANTONOVA and PLENOVA, 1971), total protein (HENERY, 1964), cholesterol (WATSON, 1960) and Glucose (WERNER, RAY and WIELINGER, 1970). The serum transaminases (S-GOT & S-GPT) were determined according to the

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method of REITMAN and FRANKEL (1959), while the alkaline phosphatase (S-AP) was determined by the method of BELFIELD & GOLDBERG (1971), a modification of the KIND & KING procedure (1954). The reagents used in these estimations were in the form of test-kits supplied by Merck-Darmstadt, West Germany. The obtained data were analysed on the basis of SNEDACOR and COCHRAN (1967).

RESULTS

Table (1) shows the average and standard error of the chemical analysis of the sera of the buffaloes suffering from parturient paresis as well as those of the control group after normal parturition.

DISCUSSION

The biochemical results as seen in Table (1) showed significant decrease in the level of both calcium (5.3 ± 0.43 mg/100 ml) and phosphorus (1.9 ± 0.32 mg/100 ml) in paretic buffaloes group ($P/0.01$). These findings agreed with those reported by KRAFT and HOFFMAN (1967), JONSSON and PEHRSON (1969) and HOFFMANN and EL-AMROUSI (1970) in dairy cows. The recorded decreasing in the level of calcium and phosphorus may be attributed to different factors. It may be due to excessive secretion of colostrum which is rich in both elements (BLOOD and HANDERSON, 1974), or the influence of post partum estrogen on gut motility and absorption of calcium (LITTLE-DIKE, *et al.* 1969), or the effect of parturition on adrenal corticoid activities which tend to be hypocalcaemic owing to their effects on the gut and their antagonism to the action of Vitamin D and parathyroid hormone (STOOT, 1957). Moreover, MAYER, *et al.* (1966) suggested that both gut stasis and the inappetence which are associated with parturition would markedly decrease the absorption of calcium from the gut.

The concentration of both sodium and potassium was significantly increased in paretic buffaloes group (301.0 ± 3.0 mg/100 ml. for sod. & 9.3 ± 0.13 mg/100 ml. for pot.) in comparison with the control group (283.9 ± 7.2 mg/100 ml. for sod. & 6.7 ± 0.31 mg/100 ml. for pot.). Our findings are similar to those reported by NILSON (1960) in dairy cows. Such elevation in both sodium and potassium could be expected as a result of adrenal inefficiency (GERALD *et al.* 1952).

The increased significant level of serum glucose (63.1 ± 2.1 mg/100 ml) of the paretic buffalo group in the present investigation could be explained on the basis that hypocalcaemia inhibits insulin release (NILSON, 1960).

Screening the data of serum cholesterol and total protein (Table 1) revealed significant increase in the level of cholesterol (170.9 ± 4.9 mg/100 ml) and decrease in the level of total protein (5.1 ± 0.22 g/100 ml) in the paretic group. The changes in both parameters in the view of LUTTMAN and PERSON (1975) were due to slight hepatic cell damage.

The activity of both serum transaminase enzymes S-GOT (37.3 ± 1.1 mu/ml) and S-GPT (8.2 ± 0.39 mu/ml) were greatly increased in paretic buffaloes ($P/0.01$) similar findings were recorded by EL-AMROUSI and HOFFMANN (1972) in parturient cows. The increased values of both S-GOT and S-GPT in the diseased group may be greatly attributed as a result to the excessive muscle and liver cell damage associated with milk fever (PEARSON, 1964).

The average values of S-AP activity was significantly higher in the paretic buffaloes group (12.1 ± 0.38 mu/ml) than in the control group of normal parturition (2.2 ± 0.92 mu/ml). These findings agree with the investigation of EL-AMROUSI and HOFFMANN (1972) in cows. The high serum

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alkaline phosphatase activity in the diseased group may be attributed to the liver dysfunction associated with parturient paresis (ROSENBERGER, 1958). Accordingly, the recorded serum activity of this enzyme in some paretic cases of our work makes its diagnostic value in cases of suspected disorders of calcium and phosphorus metabolism to be of importance.

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Table (1): Chemical analysis of the sera of buffaloes suffering from milk fever and of the control group after normal parturition

	Postpartum paretic buffaloes (n = 19)	Postpartum normal buffaloes (n = 21)
Calcium	$5.3 \pm 0.43^{**}$	9.9 ± 0.33
(mg/100 ml)	(3.0 \pm 6.0)	(7.0 \pm 11.0)
Phosphorus	$1.9 \pm 0.32^{**}$	3.1 ± 0.95
(mg/100 ml)	(1.7 - 2.8)	(3.0 - 5)
Sodium	$301.0 \pm 3.9^{**}$	283.9 ± 7.2
(mg/100 ml)	(315 - 340)	(260 - 300)
Potassium	$9.3 \pm 0.13^{**}$	6.7 ± 0.31
(mg/100 ml)	(8.2 - 10.2)	(5 - 8)
Glucose	$63.1 \pm 2.1^{**}$	43.1 ± 2.2
(mg/100 ml)	(60 - 73)	(47 - 55)
Cholesterol	$170.9 \pm 4.9^{**}$	139.0 ± 3.9
(mg/100 ml)	(165 - 181)	(131 - 150)
Total Protein	$5.1 \pm 0.22^{**}$	8.1 ± 0.98
(g/100 ml)	(4.1 - 6.5)	7.3 - 9.2
S-GOT	$37.3 \pm 1.1^{**}$	20.1 ± 2.1
(mu/ml)	(31.1 - 43.2)	(18.2 - 26)
S-GPT	$8.2 \pm 1.39^{**}$	5.1 ± 1.1
(mu/ml)	(7.1 - 13.4)	(3.1 - 6.2)
S-AP	$12.1 \pm 0.38^{**}$	2.2 ± 0.92
(mu/ml)	(10 - 16)	(1.9 - 4.1)

Mean \pm Standard Error

** P/ 0.01