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PHYSIOLOGICAL STUDY ON THE LEVEL OF PROLACTIN IN FEMALE EGYPTIAN BUFFALOES

EL-MASRY, F.A.; ABASS, H.I.; ATTIA, M.Z.;
NAHED EL-TOUKHY and M.K. SOLIMAN

Department of Physiology and Biochemistry,
Faculty of Veterinary Medicine, Cairo University

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INTRODUCTION

It has been found that prolactin contributes in regulation of several reproductive activites. Its role in lactation has been confirmed; however, its effect on gonadotrophins and ovarian activities is still not clear in buffaloes. Prolactin variation during estrous cycle was given by Ahmed (1980) in buffaloes and Madej et al. ,(1986) in cows.

Records showed a gradual rise in prolactin with advanced pregnancy (Garacia et al. ,1986 and Chung and Lee, 1986). Goland et al. (1981) and Batra et al. (1982) indicated that stress, like pregnancy, increases B-endorphin which has a stimulatory effect on prolactin.

The adverse effect of prolactin on ovarian activities has been reported by Mc-Neilly et al. (1978) and Younis et al. (1984).

The present investigation aimed to clarify the relation between prlactin levels with different reproductive states, like estrous cycle, pregnancy and post-partum period in Egyptian buffaloes.

MATERIAL AND METHODS

One hundred and thirteen blood samples were collected from Egyptian female buffaloes (5-10 years age);

representing six normal cycling buffaloes during estrous phase, nine buffaloes after ovulation, seven buffaloes with inactive ovaries, seven buffaloes were tested every month of pregnancy, 2 days, 5-13 days and 15-23 days post partum. Serum prolactin levels were measured by radioimmunoassay technique according to Maxon and Hammond (1982).

Statistical analysis was done according to Snedecor and Cochran (1967) using "t" test.

RESULTS

Restults from table (1) revealed that serum PRL level during estrus phase in buffaloes was 1.66 ± 0.10 ng/ml, while its concentration in post-ovulatory phase was 7.41 ± 0.70 ng/ml.

Buffaloes suffering from inactive ovaries had higher serum PRL (21.01 ± 1.02 ng/ml). A gradual increase of serum PRL levels in the first three months of pregnancy was observed, which were 6.51 ± 0.75; 6.90 ± 0.58 and 7.78 ± 1.21 ng/ml respectively. Maximal serum PRL levels were observed in mid-stage (4th, 5th & 6th month) of pregnancy being 10.88 ± 1.46; 10.92 ± 1.43 and 13.55 ± 1.26 ng/ml respectively. At the late stage (7th, 8th, 9th and 10th) of pregnancy the serum PRL levels were reduced to 8.68 ± 0.58; 9.90 ± 0.81; 8.50± 0.56 and 8.36 ± 0.40 ng/ml respectively (Table 2).

Serum PRL level at 2 days post-partum in buffaloes was 10.08 ± 1.07 ng/ml, which was significantly higher than those of both periods extending from 5-13 days and from 15-25 days post partum at $P < 0.05$ (Table 3).

DISCUSSION

The present results agree with Ahmed (1980) in buffaloes and Edgerton and Hafs (1973) in cows. Contrary,

Table (1): Serum prolactin levels in different reproductive states in Egyptian buffaloes .

Reproductive state	Serum prolactin level (ng/ml)
Estrus phase	$1.66 \pm 0.10^{a,b}$
Post-ovulatory phase	$7.41 \pm 0.70^{a,c}$
Inactive ovaries	$21.01 \pm 1.02^{b,c}$

± Standard error

Values having the same letters are significantly different from each other at $P < 0.01$

Swanson and Hafs (1971) and Pahwa and Pandey (1984) reported higher values in serum prolactin during estrus phase in cows. The rise of prolactin at one day after ovulation could be attributed to the decreased level of estrogen just after ovulation which triggers prolactin release essential for luteotrophic activity (Quigley and Yen, 1980).

The significant higher serum PRL level associated with inactive ovaries is similar to results obtained by William and Robert (1970) in cows and Walton et al. (1980) in ewes. Bartke et al. (1977) and Scharson et al. (1977) suggested that prolactin decreases the sensitivity of the pituitary gonadotrophins to the feed back mechanism. Clark et al. (1978) found that PRL antagonizes the action of gonadotrophins rather than proventing their synthesis or release.

Regarding prolactin level during pregnancy, similar results were obtained by Ismail et al. (1984) and

Table (2): Prolactin levels in the serum of Egyptian buffaloes during different months of pregnancy .

Duration of pregnancy/months	Serum prolactin level(ng/ml)
1st	6.51 ± 0.75 a,k
2nd	6.90 ± 0.58 b
3rd	7.78 ± 1.21 c
4th	10.88 ± 1.46
5th	10.92 ± 1.43
6th	13.55 ± 1.26 (a,b,c,d,e,&f)
7th	8.68 ± 0.58 d
8th	9.90 ± 0.81 k
9th	8.50 ± 0.56 e
10th	8.36 ± 0.40 f

± Standard error.

Values having the same letters are significantly different from each other at $P < 0.01$.

Table (3): Prolactin level in the serum of Egyptian buffaloes during the first 25 days post-partum .

Post-partum days	Serum prolactin level(ng/ml)
2 days	10.08 ± 1.07 a,b
5-13 days	6.97 ± 0.60 a
15-25 days	6.53 ± 1.05 b

± Standard error.

Values having the same letters are significantly different from each other at $P < 0.05$.

Wickramatilake, et al. (1989) who showed increased level in blood prolactin with advance of pregnancy in she-camel and cows respectively. Kalra and Kalra (1984) suggested that B-endorphin associated with stresses stimulate prolactin release.

Rise in prolactin 1-2 days post-partum was recorded by Arije et al. (1974) and Chung and Lee (1986) which confirm our results, while Batra et al. (1982) reported decline in prolactin during this period. Prolactin is necassory for initiation of milk secretion just after parturition. The PRL gradual decrease in the next stages (3-25 days) might be enough for maintaining milk yield and may facilitate the release of FSH and LH, a factor which to resumes ovarian activity.

SUMMARY

1. Serum prolactin (PRL) level in Egyptian buffaloes during estrus was (1.66 ± 0.10 ng/ml), while PRL level in the post-ovulatory phase (one day after ovulation) was high (7.41 ± 0.70 ng/ml). Buffaloes suffering from inactive ovaries had higher serum PRL (21.01 ± 1.02 ng/ml) at $P < 0.01$.

2. A gradual increase of serum PRL levels in the first three months of pregnancy which were 6.51 ± 0.75; 6.90 ± 0.58 and 7.78 ± 1.21 ng/ml respectively.

. Maximal serum PRL levels were observed in the mid-stage (4th, 5th & 6th month) of pregnancy which were 10.88 ± 1.46; 10.92 ± 1.43 & 13.55 ± 1.26 ng/ml respectively.

. At the late stage (7th, 8th, 9th and 10th month) of pregnancy; serum PRL levels were reduced being 8.68 ± 0.58; 9.90 ± 0.81; 8.50 ± 0.56 and 8.36 ± 0.40 ng/ml respectively.

3. Serum PRL level at 2 days post-partum in Egyptian buffaloes (10.08 ± 1.07 ng/ml) was significantly higher than those of both periods extending from 5-13 days (6.97 ± 0.60 ng/ml) and from 15-25 days (6.53 ± 1.05 ng/ml) postpartum at $P < 0.05$.

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