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Values of Prostaglandin During Pre- and Post-Partum and at Parturition in Buffaloes

[1]S.G. Hassan, [1]K.A. El-Battawy, [2]A.A. El-Menoufy, [3]M. Younis and [4]R.M. Khattab

[1]Department of Animal Reproduction &AI, National Research Center, Dokki, Giza, Egypt
[2]Department of Theriogenology, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt
[3]Department of Animal Physiology, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt
[4]Animal Production Institute, Ministry of Agriculture, Giza, Egypt

Abstract: The study was carried out at Mehalet Moussa, Animal Production Research Station, Animal Production Research Institute, Ministry of Agriclture, Egypt. This work was carried out on 10 late pregnant buffalo-cows for studying prostaglandin (PGF2α) during the pre- and post- partum periods. Blood samples were collected 5 days prepartum and 1 week postpartum. PGF2αconcentration was determined by enzyme-linked immunosorbant assay(ELISA). Results showed that, plasma PGF2αconcentration on day 3,2 and 1 prepartum was higher than on day 5 prepartum. On the day of delivery (day 0), a sudden sharp increase in PGF2αconcentration occurred (180.83±4.23pg ml^{-1}) followed by a gradual decrease in the plasma concentration on day 4,5 and 7 postpartum. It was concluded that PGF2 concentration is higher during delivery in buffaloes to terminate the action of parturition and to initiate the post partum uterine involution.

Key words: Buffaloes · postpartum · prepartum · calving · PGF2α

INTRODUCTION

Prostaglandin F2αis a luteolytic agent in non pregnant and pregnant ruminants[1]. PGF2α is released in a pulsitile fashion towards the end of the estrous cycle, while, near calving, it is released in more massive quantity [2]. In buffaloes,[3], reported that, the mean plasma PGF2α level remained low (0.75 ng ml^{-1}) from the day 30 tell the day 2 prepartum and increased substantially on day 1 prepartum (1.86 ng ml^{-1}). [4] recorded that PGF2α level at the beginning of the second day prepartum was low (22.2 ng ml^{-1}) then increased gradually to 83.6 pg ml^{-1} on the same day and its level fluctuated between 58.9 to 105 pg ml^{-1} on the subsequent days. On the day of calving PGF2αconcentration showed continuous increase reaching a level of 213.5 pg ml^{-1} and declined to low level of 52.8 pg ml^{-1} by the end of that day. On the firest day post partum, PGF2α level varied between 45.0 and 77.2 pg ml^{-1}.

Several studies concluded that the luteolytic release of PGF2αwill terminate the life span of corpus luteum(CL) during the short cycle post partum [5]. They recorded that in cows, intramuscular (im) injection of 25 mg PGF2α twice daily for 10 days starting on day 3postpartum achieved complete uterine involution at 7-10 days earlier than in the control group.

In buffaloes, [6] used 3 groups of buffaloes to investigate the effect of PGF2α and oxytocin on their reproductive performance. The control group receive a vehicle only, whereas, the second group received 25 mg PGF2α (Lutylase®) as a single dose intramuscular and the third group received 25 mg PGF2α and 25 international unites (IU) oxytocin (Syntocinon®) as a single dose from each drug i.m. results indicated that the intervals to the first estrus were 91.6, 31.53 and 33.0 days for the control, second and third groups, respectively, while the incidence of conception rate was 00, 26.6 and 40.0% for the three groups at 60 days postpartum and it was 10,73.3 and 93.3 % at 85 days postpartum., respectively.

The aim of the present work was to know the values of PGF2α during pre- and post partum periods in buffalo-cows as well as on the day of deliver to be to be used as a guide for treatment of reproductive disorders associated with calving.

MATERIALS AND METHODS

This study was carried out at Mehalet Moussa, Animal Production Research Station, Animal Production

Corresponding Author: Dr. Sayed G. Hassan, Department of Animal Reproduction &AI, National Research Center, Dokki, Giza, Egypt

Research Institute-Ministry of Agriclture, Egypt. This work was carried out on 10 buffalo-cows at the late stage of pregnancy for studying PGF2α concentration during the pre- and post- partum periods.

Management and nutrition of these animals were those routinely practiced by governmental farms. These animals were naturally mated and conception was confirmed by rectal palpation 2 months later. Late pregnant animals were dried and separated in special barn 3 months before the expected time of calving and were daily observed for the occurrence of physical changes associated with the approach of calving including the enlargement of udder and relaxation of the pelvic ligaments.

Blood samples were daily collected by jugular venipuncture using heparinized test tubes during days 5 prepartum as well as during the firest week post partum. Plasma samples were separated and kept at -20°C. PGF2α concentration was determined by ELISA. Using commercial kits. Statistical analysis was done according to[7].

RESULTS

Values of PGF2α in the peripheral plasma of buffalo-cows during the pre- and post-partum periods were recorded in Table 1 and depictured in Fig. 1.

The level of PGF2α in the blood plasma of buffalo-cows on day 3, 2 and 1 prepartum was higher than on day 5 prepartum.

Table 1: Levels of $PGF_{2}\alpha$ (pm/ml) around parturition in buffaloes (M±SE)

Days	Levels of $PGF_{2\alpha}$
-5	81.45±4.316
-4	85.73±3.723
-3	91.30±2.520
-2	96.85±1.583
-1	101.10±0.990
0 (Days of delivery	180.83±4.229
+1	86.11±2.062
+2	78.71±4.270
+3	73.77±4.373
+4	67.93±4.280
+5	62.61±2.862
+6	50.10±3.066
+7	41.30±2.168

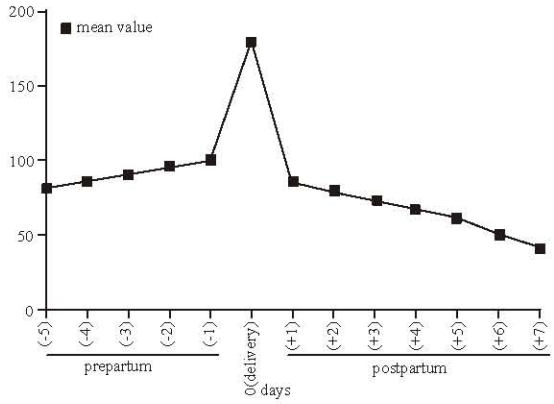

Fig. 1: Levels of $PGF_{2}\alpha$ around parturition

On the day of calving, a sudden sharp increase in the PGF2α concentration occurred (180.83± 4.23 pg ml^{-1}) followed by a gradual decrease in the plasma concentration on days 4, 5, 6 and 7 postpartum (Fig. 1 and Table 1).

DISCUSSION

This work was designed to investigate the variation in PGF2α concentration in the peripheral blood of late pregnant buffaloes for studying the pre- and post- partum changes. Results showed that, plasma PGF2α concentration increases with the approach of the time of calving, whereas concentration on day 3, 2 and 1 prepartum was higher than on day 5 prepartum. This profile was nearly similar to that recorded by [4]. The increases in PGF2α concentration is a normal physiological pattern for the termination of the life span of the corpus luteum, which is essential for the maintenance of pregnancy in bovines [7]. Such increases of PGF2α is attributed to the positive feedback effect of estrogen as well as to the high level of oxytocin [6, 7].

In the present study, it was found that on the day of delivery (day 0), a sudden sharp increase in PGF2α concentration occurred followed by a gradual decrease in the plasma concentration on days 4, 5 and 7 postpartum. This sharp increase is essential for the expulsion of the fetus and its membranes [8] as well as the regain of the genital tract to the normal size.

In conclusion, PGF2α could be used as a luteolytic agent that can hasten uterine involution and resumption of ovarian activity in buffaloes. Moreover, these values can be used as a guide for treatment of reproductive disorders associated with calving.

REFERENCES

1. Lindell, T.O. and H. Kindahl, 1983. Exogenous PGF2α promotes uterine involution in the cow. Acta Veterinaria scandenavia, 24: 269-274.
2. Edqvist, L.E., 1986. Prostgalndins in animal reproduction, notes for I.A.E.A. Training Course in Animal Reproduction, Nairobi, Kenya
3. Prakask, B.S. and M.L. Madan, 1988. Plasma prostaglandins F2αlevels at normal and induced parturition in Egyptian buffaloes. Proceeding of the second World Buffalo Congress, India.
4. Abd El Gawad, A.H.A., 1989. Profiles of some hormones of pregnancy and parturition in Egyptian buffaloes. Master of Veterinary Science Thesis, Cairo University, Egypt.
5. El-Ekhnawy, K.I., 1989. The role of PGF2α in monitoring pureperium in buffaloes in Egypt. Master of Veterinary Science Thesis, Cairo University, Egypt.
6. Sendecor, G.W. and W.G. Cochran, 1980. Statistical Method, 7ed, Ames, Iowa, University Press, USA
7. Cunningham, J.G., 1997. Textbook of Veterinary Physiology. 2nd ed., W.B. Sounders Co., Philadelphia, USA.
8. Youngquist, R.S., (Ed.) "Current Therapy in Large Animals Theriogenology".W.B. Sounders Co., USA.

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