Indian J. Anim. Res., **44** (3) : 201 - 204, 2010

AGRICULTURAL RESEARCH COMMUNICATION CENTRE
www.arccjournals.com / indianjournals.com

EFFECT OF GNRH, PMSG AND PLACENTREX ON REPRODUCTIVE PERFORMANCE OF POSTPARTUM TRUE ANESTRUS MURRAH BUFFALOES*

Puranik Prahalad, K. Sadasiva Rao[1] and K.G. Solmon Raju

College of Veterinary Science,
Rajendranagar, Hyderabad – 500 030, India

ABSTRACT

The efficacy of GnRH, PMSG and Placentrex therapeutic protocols in inducing estrus and enhancing conception rate in true anestrum buffaloes was studied. The experimental buffaloes were randomly divided in to 4 groups each consisting of 20 each. Among 80 buffaloes treated with various protocol (60 affected with postpartum anoestrum + 20 healthy cyclic buffaloes), the estrus response was found to be 70, 90, 80 and 50 percent, respectively in GnRH, PMSG, Placentrex and control group. The days taken for the onset of estrus in PMSG (74.46±12.78days) were found to be lower than GnRH (85.11±18.92 days), Placentrex (78.52±13.92 days) and control (93.55±21.84 days) groups. The intensity of estrus was observed to be better in PMSG and Placentrex groups than in GnRH and control groups. The duration of estrus was found to be significantly longer in PMSG (16.37±3.62 hrs) treated buffaloes. Similarly the interval between treatment and onset of estrus was observed to be significantly earlier in PMSG group (7.22±0.49 days) than in GnRH (10.5±0.63), Placentrex (11.25±0.54 days) and control (53±1.13days), groups, respectively. The overall conception rate was better in PMSG (77.78 per cent) group than GnRH (64.29 per cent), Placentrex (68.75 per cent) and Control (40 per cent) groups. The mean number of services required per conception in true anoestrus postpartum buffaloes treated with GnRH, PMSG, placentrex and control groups were recorded as 1.55±0.24, 1.71±0.22, 1.81±0.26 and 2.25±0.48, respectively

Key words : Postpartum true anoestrum, Murrah buffaloes, GnRH, PMSG, Placentrex.

INTRODUCTION

The buffalo population of India has 53 per cent of world buffalo population contributing 67 per cent of world buffalo milk production and buffaloes contribute 75 per cent of total milk production in Andhra Pradesh. The success of dairy buffalo economics lies in ensuring proportional and optimal reproductive rhythm of each individual female in the herd with normal physiological limits. Any deviation or prolongation in the breeding rhythm results in a progressive economic loss due to widening of dry period, reduced calvings and lactations during the lifetime of the animal.

True anoestrus condition may be a result of suppression of follicular stimulating hormone release through the effect of lactation, nutrition and systemic diseases. The present study of true anoestrum in post-partum buffalo was under taken to study the efficacy of different hormonal therapies in post-partum true anoestrum in buffaloes.

*M.V.Sc. Thesis submitted to Sri Venkateswara Veterinary University, Hyderabad.

[1] Corresponding author

MATERIAL AND METHODS

The present investigation was taken up in dairy experimental station, Rajendranagar, Hyderabad and dairy farms in and around Rangareddy district to study the efficacy of GnRH, PMSG, and Placentrex therapeutic protocols in inducing estrus and enhancing conception rate. The Murrah buffaloes with good physical condition were gynaecologically examined. The buffaloes having smooth and inactive ovaries without palpable follicles or corpora lutea on either of ovaries and without pathological condition in the reproductive tract were randomly selected for the study. Repeated rectal examinations were made at 10-12 days interval until a definite conclusion could be drawn for cause (s) of anestrum. A total number of 60 buffaloes affected with true anestrus and 20 healthy cyclic buffaloes were selected for the study. The anestrus buffaloes were randomly distributed into three groups so that each group consisted of 20 buffaloes.

The buffaloes were treated with synthetic GnRH analogue, (buserelin acetate, receptal) at the rate of 20ìg intramuscularly on day 0. The second group of buffaloes was treated with 1500 IU of pregnant mare serum gonadotrophin (Folligon) injection intramuscularly. The third group of buffaloes was treated with human placental extract (Placentrex) at a dose rate of 15 ml intravenously for three consecutive days. The fourth group of buffaloes served as control and these were injected with 5 ml of normal saline subcutaneously.

The experimental buffaloes were observed for the signs of estrus twice daily and subsequently confirmed the estrus by rectal palpation. The estrus buffaloes were bred by A.I during mid estrus and again inseminated 8 hours after first insemination in the same estrus except in PMSG group where the buffaloes were inseminated during the subsequent natural estrus. The inseminated buffaloes were watched for estrus signs up to 45 days. The buffaloes, which repeated the cycle, were inseminated again and those that did not exhibit the estrus were examined for pregnancy after 45 days by rectal examination.

The efficacy of treatments was expressed in terms of time taken for onset of estrus, duration of estrus and number of services per conception and conception rate.

RESULTS AND DISCUSSION

The estrus response was found to be 70(14/20), 90(18/20), 80(16/20) and 50(10/20) percent in GnRH, PMSG, Placentrex and control groups, respectively. The estrus response was observed to be lower (50 per cent) in control group. The estrus response was in close agreement with the findings of Narasimha Rao (1997), Shiva Prasad and Maurya (2002), Khasatiya *et al*. (2004), Markandeya and Bharkad (2004), Khasatiya *et al*. (2005).

The days taken for onset of estrus were found to be 85.11±18.9, 74.46±12.78, 78.52±13.92 and 93.55±21.84 in GnRH, PMSG, placentrex and control groups, respectively. The time taken for onset of estrus was observed to be lower in PMSG group than the other groups. The mean number of days from cessation of the treatment to the onset of induced estrus in GnRH, PMSG, Placentrex and control was found to be 10.50±0.63days, 7.22±0.49days, 11.25±0.54days and 53.00±1.13days, respectively. It was found that treatment groups had taken significantly ($P< 0.05$) less number of days for onset of estrus than control group. Similar studies were conducted by Chowdary (2003) and Khasatiya *et al*. (2004) with varied periods.

The duration of estrus was found to be 13.67±2.80 hours in GnRH group, 16.37±3.62 hours in PMSG group, 15.08±3.80 hours in placentrex group and 13.16±3.16 hours in control group. The mean duration of estrus in PMSG was significantly ($P<0.05$) longer than that of GnRH, Placentrex and control groups.

The first service conception rate among induced estrus was 55.5, 50, 45.4 and 25 per cent

and the second service conception rate was recorded as 33.33, 28.57, 27.27 and 25 per cent and the conception rate after third service was observed as 11.1, 21.42, 27.27 and 50 per cent in GnRH, PMSG, Placentrex and control groups, respectively. The overall conception rate among estrus induced buffaloes was recorded as higher in PMSG (77.78%) than in Placentrex (68.75%), in GnRH (64.29%) and in control (40.00%) groups. The mean number of services required per conception in true anoestrus postpartum buffaloes treated with GnRH, PMSG, Placentrex and control groups were recorded as 1.55±0.24, 1.71±0.22, 1.81±0.26 and 2.25±0.48, respectively and found to be somewhat lower service per conception in GnRH treated buffaloes than in other groups.

Similar studies with GnRH were conducted by Shiva Prasad and Maurya (2002), Khasatiya *et al.* (2004), Markandeya and Bharkad (2004) and Khasatiya *et al.* (2005). Chowdary (2003) Khasatiya *et al.* (2004) and Markandeya and Bharkad (2004) reported longer mean interval between treatment and onset of estrus. Efficacy of GnRH hormonal treatment depends upon availability of recruited follicles in ovarian cortex and hence the treatment response interval varies considerably. Variation in the interval between treatments to induced estrus among different treated animals could be attributed to a possible variation in their inherent endocrine status resulting in differing dose response in terms of time taken for maturation of graffian follicles The variation in the duration of estrus might be due to season, climate, nutrition status and management practices. (Rao and Kodagali, 1983). Similar services conception rate with GnRH was also reported by Khasatiya *et al.* (2004) and Markandeya and Bharkad (2004).

PMSG stimulate follicular growth in the ovaries producing endogenous estrogen, which exert positive feedback on the anterior pituitary function in turn the ovarian cyclicity in early postpartum period. Latter it shows both LH and FSH properties. Similar observations with PMSG were also reported by Shiva Prasad and Maurya (2002), Singh *et al.* (2003). Pant (2000), Yadav *et al.* (2001) Khasatiya *et al.* (2005). Markandeya and Bharkad (2004), Kasthuri (2006) and Ansari (2007).The duration of estrus in PMSG group was longer because of longer half life of PMSG.

Human placental extract contains biologically potent GnRH. Khodr and Siler-Khoder (1980) found that human placental extract contain Immunoactive PLRF (Placental Luteinizing hormone releasing factor) by radioimmunoassay and immunoflorescence microscopy. PLRF is present in cytotrophoblast of placental villi. It acts on pituitary gland to stimulate the synthesis and release of LH and FSH. The enormous quantities of PLRF in the placenta may be an extra hypothalamic source of this factor. Tamuli *et al.* (2002), Srivastava (2002) and Diwakar (2003) observed higher fertility rates in bovines by using placentrex. The varied results with placentrex might be because the dose rate of placentrex is directly proportional to the body weight. This suggests that the placentrex acted in the dose dependent manner based on body weight (Tamuli *et al.* 2002). It is also believed that placentrex which is prepared from the human placenta contains Gn-RH (Gibbons *et al.* 1975; Khodr and Siler- Khodr, 1980) and needed in higher concentration in the circulating blood to stimulate the release of LH and later FSH for follicular growth depending on the body weight. Results of present study indicate that placentrex is beneficial in alleviating anoestrus condition. Moreover, placentrex prepared from the extract of fresh human placenta contains releasing hormones, which are very low molecular proteins, provides least antigenicity with very short half-life, and can be used for repeated occasion (Kesler and Garverick, 1982; Chauhan *et al.* 1984).

ACKNOWLEDGEMENTS

The first author is thankful to the Director of Animal Husbandry, Government of Andhra Pradesh for deputation to prosecute higher studies and SVVU, Tirupati for the facilities provided to undertake the research work.

REFERENCES

Ansari, S. M. A. (2007). M.V.Sc Thesis Sri Venkateshwara Veterinary University, Tirupathi, A.P.

Chauhan, F. S, *et. al.* (1984). *Veterinary Bulletin.*, **54**: 991-1009.

Chowdary, S. (2003). *Intas Polivet.*, **4**: 134-137.

Diwakar, M. S. A. (2003). M.V.Sc Thesis Sri Venkateshwara Veterinary University. Tirupathi, India

Gibbons, J. M, *et al.* (1975). Ameri J. Obstetrics and Gynaec., **121**:127-131.

Kesler, D. J and Garverick, H. A. (1982). J. Anim. Sci., **55**:1147-1159.

Khodr, G. S and Siler-khodr, T. M. (1980). Science., **207**:315-317.

Kasthuri, K. (2006). M.V.Sc Thesis Sri Venkateshwara Veterinary University. Tirupathi, A.P.

Khasatiya, C. T, *et al.* (2004). Indian J. Dairy Sci., **57**: 324-328.

Khasatiya, C. T, *et al.* (2005). Indian J. Anim. Sci., **75** : 1153 –1158.

Markandeya, N. M and Bharkad, G. P. (2004). Indian Vet. J., **81**:461-462.

Narasimha Rao, A. V. (1997). *Indian Vet. J.*, **74**: 938-939.

Pant, M. K. R. (2000). M.V.Sc Thesis Acharya N.G.Ranga Agricultural University, Hyderabad, A.P.

Rao, N. M and Kodagali, S. B. (1983). *Indian J. Anim .Sci.*, **53**: 553-555.

Shiva Prasad and Maurya, S. N. (2002). *Indian Vet. Med. J.*, **26**: 205-207.

Singh, S, Wani, N. A and Maurya, S. N. (2003). *Indian J. Anim .Sci.*,**73**: 894-896.

Srivastava, P. K. (2002). XVIII Annual convention of ISSAR and National symposium at IVRI, Izatnagar November 14-16 pp.103-104.

Tamuli, M. K, Das, K. K and Sinha, C. K. (2002). *Indian Vet. J.*, **79**:680-683.

Yadav, K. V. S, *et al.* (2001). *Indian J. Anim .Reprod.*,**22** :113-115.