EFFICACY OF $PGF_{2\alpha}$, CIDR AND OVSYNCH TREATMENT ON ESTRUS RESPONSE AND FERTILITY RATE IN CROSSBRED COWS

T. SATHIAMOORTHY[1] AND M. KATHIRCHELVAN

Farmers Training Centre, Tiruvarur,

Tamil Nadu Veterinary and Animal Sciences University, Chennai-51.

Received : 25.3.2010 Accepted : 8.9.2010

ABSTRACT

A total of three hundred and seventy five postpartum crossbred cows were divided into three groups viz group I, II and III. Group I animals (n=180) were treated with $PGF_{2\alpha}$ after palpation of corpus luteum. Group II animals (n=155) were treated with CIDR (Controlled Internal Drug Release Device). Group III animals (n=40) were treated with ovsynch protocol. Fixed time artificial insemination was performed in the responded animals. Percentage of induced estrus and mean onset of induced estrus were 71.11, 83.20, and 67.50 and 58.8, 44.4, 53.4 hrs in group I, II and III respectively. First service conception rate was 52.20, 42.74 and 55.55 per cent in group I, II and III respectively. From this study it may be concluded that Ovsynch treated crossbred cows gave better fertility rate compared to $PGF_{2\alpha}$ and CIDR treated cows.

Key words: Ovsynch protocol, Fertility rate, Cows

Many different protocols has been evolved for the estrus synchronization in crossbred cows with $PGF_{2\alpha}$, Progesterone and combination of $PGF_{2\alpha}$ and Progesterone but the precision of estrus and fertility rate on fixed time insemination is not optimum. Ovsynch was effective in synchronizing the time of ovulation and results in better fertility rate on fixed time insemination and eliminates the need for estrus detection. (Mialot *et al.* 2003). Hence, the present study was carried out with the objective to compare the efficacy of $PGF_{2\alpha}$, CIDR and Ovsynch treatments on estrus response and conception rate in crossbred cows.

The present study was conducted during the period from 2003 to 2005 in three hundred and seventy five healthy, non pregnant crossbred cows (parity>1), 60 days postpartum in 20 villages around Tiruvarur. Prior to the start of experiment all the selected cows were dewormed and fed with 30 g of mineral mixture for a period of twenty days. Selected cows were divided into three groups, viz Group I, II and III. Group I (n=180) animals were included based on the rectal palpation of the corpus luteum (CL) in any one of the ovary and were treated with 25 mg of $PGF_{2\alpha}$ (5 ml Lutalyse, Upjohn pharma) intramuscularly. Group II (n=155) animals were selected on the basis of absence of palpable CL in any of the ovaries at the time of rectal palpation and they were treated with CIDR (EAZI BREED CIDR TM, Inter Ag, Hamiltion, New Zealand) intravaginally which was removed after 9 days. Group III (n=40) animals were selected at random and treated with 8ug of GnRH analogue (2.0 ml Receptal, Unichem) intramuscularly. Six days later, 25 mg of $PGF_{2\alpha}$ was administered intramuscularly. A second injection of 8ug GnRH analogue was administered after 48 hrs of $PGF_{2\alpha}$ treatment. All the treated cows were observed for estrus signs. Rectal palpation was done at every 12 hrs to confirm estrus. Duration of estrus was observed and recorded in all the responded cows. The blood samples were collected on day 0 and 3, day 0, 9 and 11 and day 0, 6 9 in Group I, II and III animals, respectively. The progesterone concentration in the serum was estimated using progesterone Radio Immuno Assay Kit (Coat a count, Diagnostic Products Corporation, USA) employing solid phase Radio Immuno Assay Technique. The animals that responded for estrus induction were inseminated at 72 and 96, 48 and 72 hours after $PGF_{2\alpha}$ injection/CIDR removal in group I and II, respectively and at 72 hours after $PGF_{2\alpha}$ injection in group III animals. Non-responded cows were not inseminated. Cows did not conceive and exhibited estrus symptoms after 18 to 21 days of insemination were rebred by artificial insemination at observed estrus. Pregnancy diagnosis was performed by rectal examination after 60 days after the last insemination. Statistical data were analysed by using test of significance.

1. Associate Professor, Dept. of Clinics, Madras Veterinary College, Chennai-7
E mail- sathiaog@yahoo.co.in

Analysis of results (Table) revealed that group II animals had significantly higher percentage (83.20%) of induced estrus than group I (71.11%) and III (67.50%). The percentage of induced estrus in ovsynch treated animals in the present study was lower than those reported by Sathiamoorthy (1997) and Kawate *et al.* (2004) in a similar study. The percentage of estrus response obtained in the present study was similar to the earlier reports of Pursley *et al.* (1995) and Shanmugavel (2005). Among the three groups, comparatively lower rate of estrus induction in ovsynch treated animals (group III) might be due to the fact that the effect of GnRH in animals with inactive ovaries depended on the stage when the follicular wave was arrested. Cows with static ovaries bearing follicles smaller than 8.5 mm may not respond to GnRH (Wiltbank *et al.*, 2002).

There was a significant difference (P<0.01) in the mean time taken for the onset of estrus between groups I and II and the estrus onset was spread over for longer periods in both the groups. This finding was similar to report of Mialot *et al.* (2003). However, the reduced variability in the onset of estrus (24 to 72 hrs) in Ovsynch treated animals (Group III) might be due to the presence of matured follicle in most of the cows at the time of $PGF_{2\alpha}$ administration which resulted in the synchronous onset of oestrus (Twagiramungu *et al.*, 1995). This result substantiate the fact that administration of GnRH 6 days prior to $PGF_{2\alpha}$ treatment improves the precision of estrus as reported by Pursley *et al.* (1995). Most cows in the present study showed intermediate signs of estrus except those of CIDR treated group in which most cows showed intense estrus.

Conception rate obtained (52.20%) in $PGF_{2\alpha}$ treated cows in this study is higher than the earlier report of Shanmugavel (2005) in a similar study in non-descript cows at field conditions. Similarly a conception rate of 42.74% was obtained in CIDR treated cows, which is higher than the report of Kawate *et al.* (2004). Conception rate of 55.55% obtained in this study in ovsynch treated cows was higher than the earlier report of Mialot *et al.* (2003) and Kawate *et al.* (2004). Comparatively higher conception rate in ovsynch treated cows might be due to the synchronized onset of estrus in most cows which resulted in better conception rate on fixed time insemination when compared to $PGF_{2\alpha}$ alone and CIDR treated cows in which the distribution of estrus onset ocurred for longer period of time. Progesterone assay revealed that the mean progesterone levels showed an increasing trend from the day of treatment in group II and III. This might be due to the formation of accessory corpus luteum by GnRH administration in group III animals. Hence it may be concluded from this study that Ovsynch treated crossbred cows gave lower estrus response but better fertility rate compared to $PGF_{2\alpha}$ and CIDR treated cows at field conditions.

Table : Distribution, duration of induced estrus and conception rate in different groups

Groups	Percentage of Induced estrus	Mean onset of Induced estrus	Distribution of onset of estrus (No. of animals) Hrs after $PGF_{2\alpha}$ inj/CIDR removal				Duration of estrus (Hrs)	Conception Rate
			0-24	24-48	48-72	72-96		
Group I	71.11[b]	58.8[b] ± 4.1	9	32	62	25	26.4±4.4[a]	52.20[a]
Group II	83.20[a]	44.4[a] ± 2.5	14	48	59	8	24.6 ±5.2[a]	42.74[b]
Group III	67.50[b]	53.4[a] ± 7.0	-	8	18	1	22.4±1.6[a]	55.55[a]

Means bearing different superscript differ significantly (P<0.01)

ACKNOWLEDGEMENT

The authors acknowledge the Department of Bio-Technology, Ministry of Science and Technology, Govt. of India for the funding of Project titled "A Pilot Project on Upliftment of Economic Status of Rural Women through adoption of Estrus Synchronization and fixed-time breeding in dairy cattle" under which the present research work was under taken.

REFERENCES

Kawate,N. T.Itam, T.Choushi, T. Saitoh, T.Wada, K. Matsuoka, K. Uenaka, N. Tanaka, A. Yamanaka, M. Sakase, H. Tamada, T.Inba and T.Sawada (2004). Improved conception rate in timed- artificial insemination using a progesterone -releasing device and Ovsynch protocol in post partum suckled Japanese Black beef cows. *Theriogenology,* **61**:399-406.

Mialot,J..P. F. Constant, P.Dezaux, B. Grimard,F. Deletang and A.A. Ponter (2003). Estrus synchronization in beef cows : Comparision between GnRH + $PGF_{2\alpha}$ + GnRH and PRID+ $PGF_{2\alpha}$ + eCG. *Theriogenology,* **60**:319-330.

Pursley, J.R., M.O. Mee, and M.C. Wiltbank, (1995). Synchronization of ovulation in dairy cows using $PGF_{2\alpha}$ and GnRH. *Theriogenology,* **44**: 915 - 923.

Sathiamoorthy, T. (1997). Influence of Gonadotropin - Releasing hormone on estrus synchronization and fertility in crossbred dairy cows. M.V.Sc thesis submitted to Tamilnadu Veterinary and Animal Sciences University, Chennai - 51.

Shanmugavel,S., (2005). Fertility in non-descript cows following controlled breeding under field conditions. M.V.Sc thesis submitted to Tamilnadu Veterinary and Animal Sciences University, Chennai -51.

Twagiramungu, H. Guilbault, L.A and Dvfour, J.J. (1995). Synchronization of ovarian follicular waves with a gonadotropin releasing hormone agonist to increase the precision of estrus in cattle. A review. *J. Animal. Sci.,* **73**: 3141 - 3151.

Wiltbank, M.C., A.Gumen and R. Sartori (2002). Physilogical classification of anovulatory conditions in cattle. *Theriogenology,* **57**: 21 - 52.