PROGESTERONE PROFILE IN TWO DIFFERENT PROTOCOLS OF ESTRUS SYNCHRONIZATION IN POST PARTUM RED KANDHARI COWS

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ABSTRACT

Thirty six post-partum Red Kandhari cows were selected and randomly divided into two groups i.e. protocol group I (Select synch) and Protocol Group-II (Ovsynch) comprising twelve animals each and control Groups III and IV comprising six animals each. Protocol group animals were administered with injection GnRH 100µg intramuscularly on day 1st followed by injection PGF2 526µg intramuscularly on day 7th. Second injection of GnRH 100µg was administered intramuscularly only in protocol group II on day 9th and after 16-22 hrs of second GnRH injection, fixed time inseminations were carried out whereas in protocol group I, animals confirmed in estrus were bred by AI at appropriate times. The mean serum progesterone level of cows on day 1st, 7th, 9th and 19th of the trial in protocol group I was 01.80, 02.90, 01.10, 04.20 and in protocol group II the same was 01.90, 03.60, 01.10 and 06.84 ng/ml on day 1st, 7th, 9th and 19th whereas in control groups iii and IV, the level was 2.5, 2.4, 2.3, 2.4 and 2.5, 2.4, 2.3, 2.5 ng/ml respectively. The difference in the level of progesterone was non-significant throughout the experiment in control group animals. Selectsynch protocol in Red Kandhari cows was effective to induce estrus with 66.67 per cent efficacy and 87.50 per cent conception rate and 58.33 per cent pregnancy rate, whereas ovsynch protocol was successful to induce estrus with 66.67 per cent efficacy with 50.00 per cent conception rate and pregnancy rate.

Key words: Estrus synchronization, Red Kandhari, Cows.

New strategies for ovulation synchronization have been developed which allow the use of fixed-time AI (FTAI) with or without the need of estrus detection. Protocol for synchronized ovulation and timed AI (TAI) in lactating dairy cows known as OvSynch allows AI submission rates close to 100.00 per cent (Pursley *et al.,* 1995; and Jobst *et al.,* 2000). Use of GnRH and Prostaglandins with 7 days interval and AI after heat detection is attempted in selectsynch protocol. Since progesterone level is the key compartment of estrus cycle which predicts the chances of conceptions, study was carried out to record progesterone profile in post partum Red kandhari cows treated for estrus induction with two different protocols.

Thirty six post-partum Red Kandhari cows were selected from the institute's organized cattle farm and were divided in two protocols. Protocol (Select synch) Group -I was attempted in 12 cows by administration of GnRH 100µg (inj. Receptal, containing 0.0042 mg/ml buserelin acetate equivalent to 0.004 mg buserelin,) im on day 1st followed by injection $PGF_{2\alpha}$ 526µg (inj. Cyclix, containing 263 µg/ml cloprostinol sodium.) im on day 7th. All the treated animals were closely observed for heat detection and animals confirmed in estrus were bred by AI at appropriate time.

Protocol (Ovsynch) Group-II was undertaken in 12 cows similar to select synch group with second injection of GnRH 100µg i/m on day 9th and after 16-22 hrs fixed time inseminations were carried out in the animals. Control Groups III and IV were maintained with six cows each. Blood samples from animals under trial were collected from jugular vein aseptically on following days. GnRH treatment day (day 1st), $PGF_{2\alpha}$ treatment day (day 7th), Day of insemination (day 9th) and ten days after AI (day 19th) and serum samples were stored at -20°C. Progesterone was estimated by using DEMEDITEC progesterone ELISA kit. The data was analyzed by using Completely Randomised Design test (Panse and Sukhatme, 1986).

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The clinical observations regarding response to both protocol treatments in post partum Red kandhari cows are shown in Table. The animals from protocol group I and II showed 66.67 per cent of estrus induction and 58.33 per cent pregnancy rate for Group I whereas the same was 50.00 per cent for Group -II. Studies have shown that most of the progestogen-based estrus synchronization programs for cattle are associated with a reduction in conception rate at the synchronized estrus which has been attributed to the development of persistent dominant follicles and subsequently the ovulation of aged oocytes that, if fertilized, result in a poor quality embryos with reduced developmental capacity (Mihm *et al.* 1994 and Wishart, 1977). Present findings regarding pregnancy rate are in close agreement with Kojima *et al.* (2000) who reported 53.00 and 64.00 per cent in pregnancy rate in anestrus and cyclic beef cows respectively. Britt and Gaska (1998) reported 47.00 per cent conception rate whereas the same was reported as 46.66 per cent by Raut *et al.* (2008) with the same protocol.

It was observed that mean progesterone level in noncyclic postpartum Red Kandhari cows (anestrus phase) were 1.8 ± 0.1 ng/ml and 1.9 ± 0.2 ng/ml in Group I and II respectively. GnRH treatment on day 7th of the both protocol causes subsequent formation of corpora lutea and hence the progesterone level was significantly increased to 2.9 ± 0.2 ng/ml and 3.6 ± 0.4 ng/ml in Group I and II respectively.

On injecting $PGF_{2\alpha}$ on day 7th of both protocols, progesterone levels dropped significantly in all the responded animals whereas non-responded animals continued irregular fluctuations in the level of progesterone. However, lowest level of progesterone was recorded on day 9th of the protocol with mean value as 1.1 ± 0.1 ng/ml and 1.1 ± 0.2 ng/ml respectively in select synch and ovu synch protocols. All the responded animals showed progesterone levels less than 1ng/ml on day 9th i.e. day of estrus in both the protocol groups.

Progesterone levels were significantly increased and reached to highest levels during the experimental period on day 19th of the protocol group II. The progesterone levels were higher than10 ng/ml in responded animals whereas in non-responded animals, levels were less than 4.5 ng/ml. The progesterone levels were higher than 4ng/ml in responded animals whereas in non-responded animal, levels were less than 4ng/ml. The animals from protocol group II i.e. Ovsynch protocol, received luteotropic dose of GnRH on day of estrus and hence the level of progesterone was numerically higher in protocol group II as compared to protocol group I on day 19th as per the expectation.

In control group animals, Progesterone level on day 1st, 7th, 9th and 19th was 2.5 ± 0.2, 2.4 ± 0.2, 2.3 ± 0.2 and 2.4 ± 0.1 ng/ml and 2.5 ± 0.2, 2.4 ± 0.2, 2.3 ± 0.1 and 2.5 ± 0.1 ng/ml for Group I and Group II respectively, The difference in the level of progesterone was non-significant throughout the experiment in control group animals.

The present findings of both the protocols regarding level of progesterone on day of estrus are in close agreement with Hashizume and Owikawa (1983) who reported the level as 0.63 ± 0.13 ng/ml. Similarly, the present findings are in consonance with O'Farell (1983) who observed the level of progesterone less than 1 ng/ml on day of estrus. Dixit and Khan (1982) and Judek (1983) also reported the level of progesterone less than 1 ng/ml on day of estrus which is also in consonance with the present findings.

Selectsynch protocol in Red Kandhari cows could be used to induce estrus in post-partum phase with 66.67 per cent efficacy with 87.50 per cent conception rate and 58.33 per cent pregnancy rate. Ovsynch protocol in Red Kandhari cows could be used to induce estrus in post-partum phase with 66.67 per cent efficacy with 50.00 per cent conception rate and pregnancy rate. Assessment of progesterone profile during experimentation of induction of estrus is helpful in getting maximum number of animals pregnant.

Table : Gynaeco-clinical observations of protocol group I and control group I in Red Kandhari cows.

Particulars		Protocol group I	Protocol group II	Control group I	Control group II
Total number of animals under trial		12	12	06	06
Responded animals		08 (66.67%)	08 (66.67%)	Nil	Nil
Animals ovulated		08 (66.67%)	08 (66.67%)	Nil	Nil
Treatment response interval (Days)		_	FTI	---	---
Conception	1st oestrus	05	4	---	---
	2nd oestrus	01	2	---	---
	3rd oestrus	01	—	---	---
	Overall	07	6	---	---
Services / conception		1.43	1.33	Nil	Nil
Conception rate (%)		58.33	50.00	Nil	Nil
Pregnancy rate (%)		58.33	50.00	Nil	Nil
Establishment of cyclicity (%)		66.67	66.67	Nil	Nil

Superscripts are to be read column wise for mean comparison (P > 0.05), CD = 1.51

REFERENCES

Britt, J.S., and J. Gaska. (1998) Comparison of two estrus synchronization programs in a large confinement-housed dairy herd, *J. Am. Vet. Med. Assoc.*, **212**: 210-212.

Dixit, V.P. and Khan, S.K. (1982) Estradiol and progesterone level in cows during oestrus cycle and early pregnancy. *Anim. Breed. Abstr.*, **50**: 7093.

Hashizume, T. and Owikawa, E. (1983) Changes in progesterone concentrations in blood plasma and milk after administration of $PGF_{2\alpha}$ analogues in Japanese shorthorn. *Anim. Breed. Abstr.*, **51** : 1551.

Jobst, S.M., R.L. Nebel, M.L., MeGilliard and K.D. Pelzer. (1999) Evaluation of reproductive performance in lactating dairy cows using three systematic breeding protocols: 14-d PGF, timed AI, and GnRH-PGF. *J.Dairy Sci.*, **82** (Suppl. 1): 57 (Abstr.).

Judek, J. (1983) Progesterone in the blood of cows at oestrus and during early pregnancy. *Anim. Breed. Abstr.*, **51**:6992

Kojima F.N., B.E. Salfen, J.F. Badar, W.A. Ricke, M.C. Lucy, M.F. Smith and D.J. Patterson (2000). Development of an estrus synchronizaiton protocol for beef cattle with short-term feeding of melengestrol acetate : 7-11 Synch. *J.Anim. Sci.*, **78**:2186-2191.

Mihm,M., A. Baguisi,M. P. Boland, and J. F. Roche (1994). Association between the duration of dominance of the ovulatory follicle and pregnancy rate in beef heifers. *J.Reprod. Fertil.*, **102**:123-130.

O'Farell, K.J. (1983) Accuracy of rectal palpation based on plasma progesterone levels. *Anim. Breed. Abstr.*, **51**: 2787.

Panse V.G. and P.V. Sukhatme (1986) Statistical methods for Agricultural workers. Published by ICAR, New Delhi.

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

Raut, B. M., Raghuwanshi, D. S., chinchkar, S. R., Sahatpure, S. K., Raut, J. D. and Raghorte, Y. M. (2008) Synchronization of estrus by Ovsynch protocol. CRO abstract : 51.

Wishart, D. F. (1977). Synchronisation of oestrus in heifers using steroid (SC5914, SC9880 and SC21009) treatment for 21 days. 2. The effect of treatment on the ovum collection and fertilization rate and the development of the early embryo. *Theriogenology,* **8**:249-269