

A STUDY ON PUERPERAL EVENTS AND POSTPARTUM REPRODUCTIVE PERFORMANCE IN KANKREJ COWS

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ABSTRACT

A study was carried out on 42 normal parturient Kankrej cows of 2nd to 4th parity on an organized farm during the period from 2010-12 to evaluate the puerperal events and postpartum fertility with and without use of oestrus induction / synchronization protocols (viz., Ovsynch, CIDR, Ovsynch+CIDR, Cosynch and PGF₂ α) around day 90-95 postpartum in anoestrus/suboestrus cows. Palpation per rectum was carried out at five days interval from day 10 to 40 postpartum, to monitor ovarian changes and uterine involution, and around day 70-90 at 10 days intervals to confirm anoestrus/suboestrus condition. The plasma progesterone levels were estimated by RIA at 10 days interval from calving till 140 days postpartum. The birth weight of calf, time required for expulsion of fetal membranes and weight of expelled fetal membranes were 24.29 ± 1.54 kg, 5.04 ± 2.01 hrs and 2.84 ± 0.76 kg, respectively. Complete uterine involution was noted in Kankrej cows by mean interval of 36.80 ± 1.21 (range 32-45) days postpartum. The interval for occurrence of first oestrus postpartum clinically and through plasma progesterone profile was 105.49 ± 1.66 (range 86-106) and 56.42 ± 3.88 (range 30-80) days, respectively ($P < 0.05$). The first service and overall conception rates of three consecutive cycles obtained were 30.95 (13/42) and 40.47 (17/42) per cent, respectively, within 150 days postpartum. The fertility response to all the five oestrus synchronization treatments used in anoestrus/suboestrus cows was at par with that of the normal cyclic cows in the same herd. However, the animals of the mega mineral bolus group showed significantly lower fertility response in stipulated time as compared to the control group.

KEY WORDS: Kankrej cows, Puerperal events, Plasma progesterone, Oestrus synchronization, Fertility.

INTRODUCTION

Fertility of the cow in the months following calving depends on satisfactory involution of uterus and re-establishment of cyclical ovarian activity. Prolonged interval between calving and onset of ovarian function is regarded as one of the most important gynaecological problems responsible for failure to maintain optimum reproductive efficiency, which in turn causes economic loss to the dairy farmers (Shamsuddin et al., 2006; Kamal, 2010). The Kankrej animals have a majestic look. It is a dual purpose zebu cattle breed with known prolonged postpartum suboestrus and anoestrus problems. Malnutrition, mismanagement, poor health care, suckling and hot-humid climate of tropical countries like India have increased the postpartum suboestrus, anoestrus and other infertility problems in dairy animals. Researchers have made remarkable strides in developing oestrus induction/synchronization protocols such as Ovsynch, Cosynch, CIDR etc. for such animals (Khade et al, 2011; Bhoraniya et al., 2012). The available literature on the puerperal events and postpartum fertility without and with oestrus synchronization regimens is skimpy in Kankrej cows even under their native agro-climatic conditions of middle Gujarat, and hence this study was attempted to explore these aspects in Kankrej cows of an organized farm in Anand.

MATERIALS AND METHODS

The present investigation was carried out on 42 normal parturient Kankrej cows of 2nd to 4th parity at Livestock Research Station, AAU, Anand (middle Gujarat) during the year 2010-12 to evaluate puerperal events and postpartum fertility without and with use of oestrus synchronization protocols (viz., Ovsynch, CIDR, Ovsynch + CIDR, Cosynch and PGF₂α) initiated around day 90-95 postpartum according to anoestrus or suboestrus status. The sex and birth weight of calves as well as the time required for expulsion of placenta and placental weight were recorded. Uterine involution and initiation of ovarian activity was assessed initially by palpation per rectum of each animal at five days interval from day 10 to 40 postpartum. Subsequently, the reproductive/ovarian status was assessed by palpation per rectum of the genitalia on three occasions, each at 10 days interval beginning at day 70 postpartum in cows not expressing behavioural oestrus. Cows were inseminated only after 60 days of calving, if found in oestrus. The oestrus synchronization treatments, viz., Ovsynch, CIDR, Ovsynch + CIDR, Cosynch and PGF₂α were initiated at random around day 90-95 postpartum in anoestrus and suboestrus cows, with fixed time AI using good quality frozen-thawed semen. The findings on gynaeco-clinical examinations as well as oestrus and fertility response to various treatments were recorded till day 150 postpartum.

Blood samples were collected from the jugular veins at 10 days intervals from calving till 140 days postpartum with two additional samples on day of initiation of treatment (day 90-95), day 7 of treatment (day 97-102) and on day of induced oestrus & AI (day 100-105 postpartum) for estimation of plasma progesterone concentrations by RIA technique. The data generated were analyzed statistically using CRD and 't' test (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

Placental Expulsion Time, Placental Weight and Birth Weight of Calf

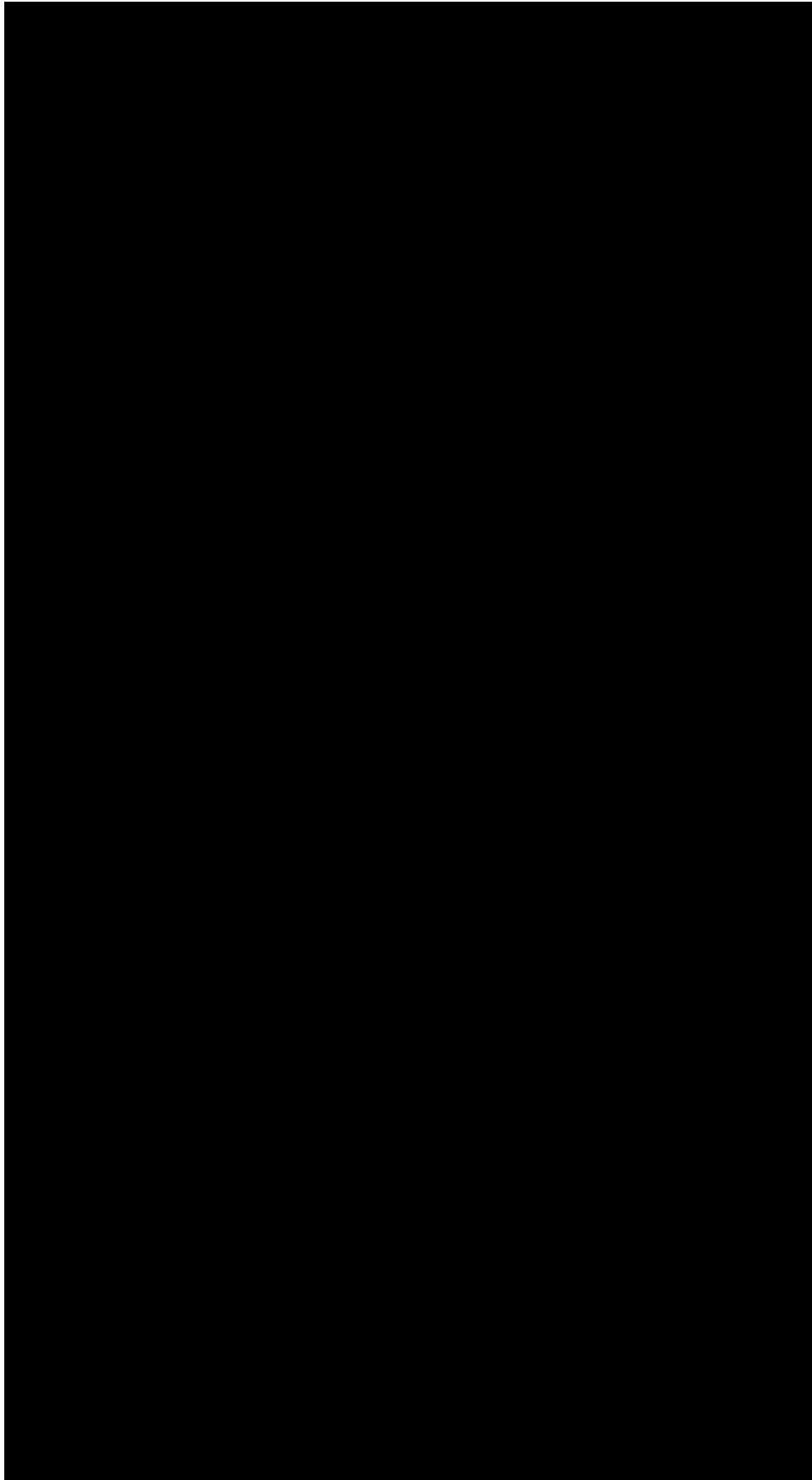
The average birth weight of calf (Kankrej plus K x HF), time required for expulsion of fetal membranes and the weight of expelled fetal membranes in Kankrej cows were 24.29 ± 1.54 kg, 5.04 ± 2.01 hrs and 2.84 ± 0.76 kg, respectively. There was no significant effect of sex of calf on these traits, although males were little heavier with slightly higher placental weight but shorter expulsion time. The sex ratio of male to female birth was at par. The three traits studied with respect to mean values and effects of sex of calf were in accordance with the values and trend documented in literature for the zebu cattle (Anonymous, 2010; Ammu and Dharni, 2012).

Postpartum Reproductive Performance of Kankrej Cows

The Kankrej cows under study revealed complete uterine involution by mean interval of 36.80 ± 1.21 (range 32-45) days postpartum. There was no significant difference between seven groups for this trait. The mean interval for occurrence of first oestrus postpartum clinically and through plasma progesterone (P4) profile was 105.49 ± 1.66 (range 86-106) and 56.42 ± 3.88 (range 30-80) days, respectively (P<0.05) (Table 1; Fig. 1). Coincidentally the lowest values of plasma P4 seen around day 100 in most of the animals were attributed to induced oestrus, where both plasma P4 profile and behavioural signs of oestrus coincided. Significantly longer interval for first oestrus postpartum noted clinically was due to the fact that many of the animals (18/42) were anoestrus beyond day 40/50 postpartum and almost same (18/42) cows were suboestrus which ovulated silently at least once, before being taken up for treatment or AI, and that most of the treated cows exhibited induced synchronized oestrus almost at the same time on day 99 to 106 postpartum.

The onset of ovarian activity during postpartum period is a complex phenomenon, which constitutes the uterine involution, regression of pregnancy CL and resumption of ovarian follicular activity. A delay in the resumption of ovarian activity postpartum is one of the important factors contributing to prolonged calving to conception interval in dairy animals. In the present study, the time taken

Table 1. Reproductive performance of Kankrej cows within 150 days postpartum following use of different oestrus induction/synchronization treatments at day 90 postpartum (Mean \pm SE)



for uterine involution and resumption of ovarian activity were in agreement with the values recorded in cows by Sheshappa et al. (2002), Patel et al. (2005) and Ammu and Dhama (2012). In contrast, a slightly shorter uterine involution time of 31.12 ± 0.93 days in Surti buffaloes was reported by Khasatiya et al. (2006). Delayed uterine involution is usually coupled with abnormal calving, clinical and subclinical genital infections and or inflammations, leading to failure of timely regression of pregnancy corpus luteum, thus, hampering resumption of ovarian activity postpartum.

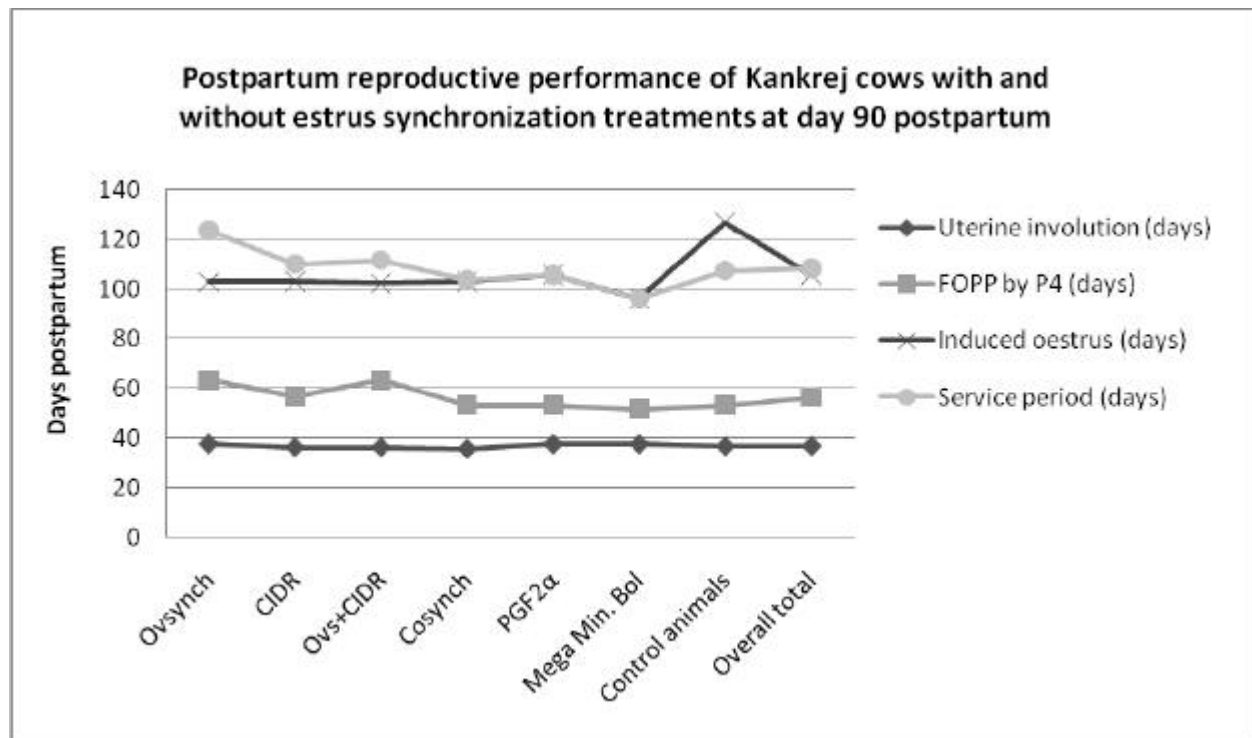


Fig. 1. Observations of uterine involution, first oestrus postpartum by P4 & clinically, and service period within 150 days of calving in individual Kankrej cows under different treatment groups and cyclic control group

The calving to conception interval (service period) and overall conception rate are the most useful overall measures of reproductive performance. In the present study, few animals ovulated silently, while others remained anoestrus till day 90 postpartum. This could be possibly due to suckling effect or mothering instinct, as the calves could not be weaned in Kankrej cows under study, and it is also a well known fact that zebu cattle are slow breeders with delayed and poor oestrus expression postpartum compared to exotic and crossbred cows (Anonymous, 2010; Ammu and Dhama, 2012). In this study, untreated control group of cows had significantly shorter first oestrus postpartum compared to treated groups, as evident through clinical manifestation of oestrus signs and plasma progesterone profile (Table 1). However, almost similar values observed for postpartum interval to first oestrus, both by P4 assay and clinically were due to better oestrus synchronization induced by hormonal therapies around day 90-95 postpartum in all five hormonal treatment groups. Because of this fact only, the service period and number of inseminations required per conception were less and almost similar in these 5 groups. However, Mega mineral bolus insertion intra-ruminal on the day of calving did not reveal any beneficial effect on reproduction till 150 days post partum (Table 1).

The overall first service conception rate obtained at spontaneous/induced oestrus was 30.95 per cent among 42 Kankrej cows under study, and 3 and 1 more cows conceived with 2nd and 3rd oestrus/AI, respectively, giving overall conception rate of 40.47 (17/42) per cent within 150 days

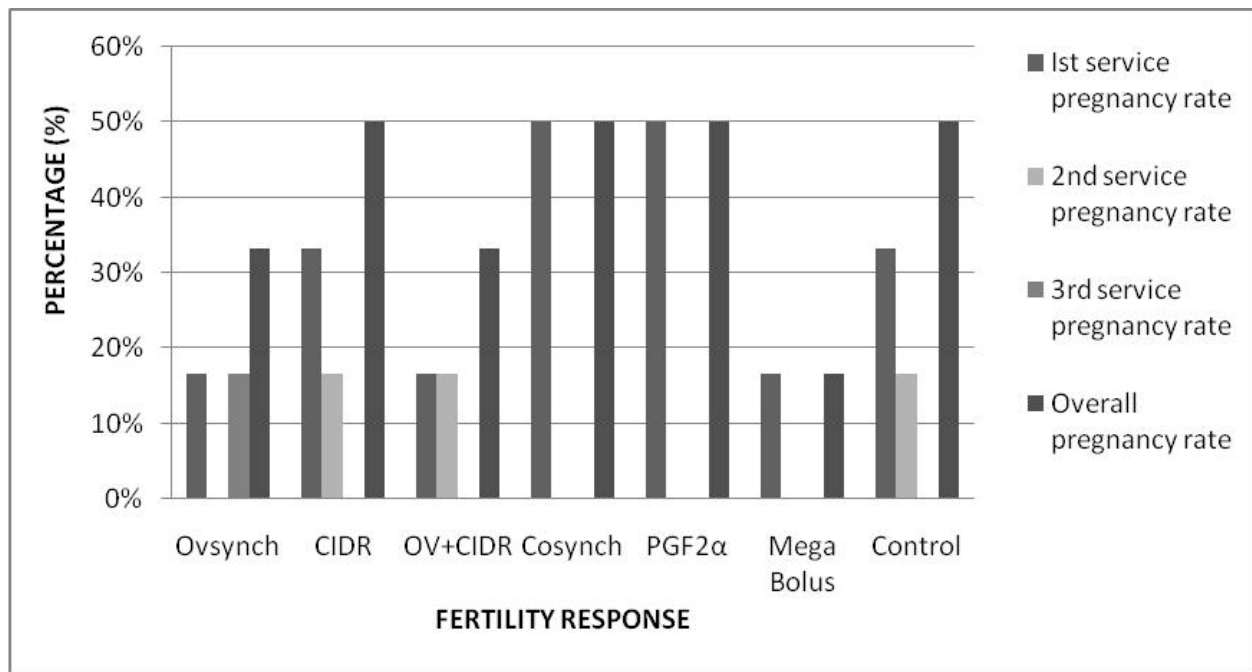


Fig. 2. Conception rate in postpartum anoestrus and suboestrus Kankrej cows following use of estrus induction/synchronization protocols, mineral supplement (Mega bolus) and in cyclic control group

postpartum. The first service or overall conception rates were apparently not much different between control and six treatment groups (Tables 1; Fig. 2). Similar results were reported by some workers with same oestrus induction protocols in cows (Khade et al., 2011; Ammu and Dhimi, 2012; Bhoraniya et al., 2012) and buffaloes (Awasthi et al., 2009; Naikoo et al., 2010). Further, Khasatiya et al. (2006) and Patel et al. (2007) noted significantly early onset of first oestrus postpartum with better first service conception rate in Surti buffaloes and HF cows, respectively, after administration of GnRH or PGF₂α on day 40-49 postpartum as compared to untreated groups.

Moreover, all the cows under study were hefty and physically sound with body condition score of 3 to 3.5 weighing 400 to 450 kg at parturition, but lost lot of weight amounting to 40-60 kg within a fortnight and further continued to loose weight inspite of routine feeding till 2 months postpartum, where majority of them were reduced to leanness with body condition score around 2 to 2.5 only due to onset of lactation and negative energy balance. Many of these cows had expressed 1 or 2 cycles by this time, but then suffered from anoestrous/suboestrus condition almost throughout the lactation, unless induced to oestrus. However, the cows that conceived either early or late showed improvement in body condition of their own due to known anabolic effect of continued secretion of progesterone from the corpus luteum during pregnancy.

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