

Research Article

CONCEPTION RATE IN POSTPARTUM COW USING CIDR ALONG WITH UTERINE ECBOLICS

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ABSTRACT: A rapid postpartum uterine involution process followed by the early onset of cyclic ovarian activity is of paramount importance for achieving a continuous intensive reproduction in cows. Thirty six (36) normally calved pluriparous Holstein Friesian crossbred cows were equally divided into 4 experimental groups viz. groups I, II, III and IV (control). On day 2 postpartum, the animals of the group I were treated with an intramuscular injection of 25 mg PGF₂ α, group II with 50 IU oxytocin, group III with 5 mg methyl ergometrine maleate and group IV with 5 ml normal saline. All the cows of four groups were inserted with Controlled Internal Drug Release device on day 45-55 postpartum intra-vaginally and left in situ for 9 days along with an intramuscular injection of 25 mg of PGF₂ α 24 hours before the withdrawal of CIDR. At 48 and 72 hours of CIDR withdrawal, timed artificial insemination (TAI) using frozen thawed semen was performed to all the cows. The first service, second service and overall first and second service conception rates were 44.44, 22.22 and 66.66 in group I; 11.11, 33.33 and 44.44 in group II; 22.22, 33.33 and 55.55 in group III and 11.11, 22.22 and 33.33 in group IV, respectively. Among the treatment groups, quicker uterine involution and higher overall conception rate were noticed in group I cows.

Key words: Crossbred cows, Ecbolics, CIDR, Postpartum, Conception rate.

INTRODUCTION

Uterotonic drugs are administered during the puerperal phase in cows to evacuate the uterine contents by increasing its contractility with an aim to accelerate the process of involution. Natural prostaglandin F_{2α} or its synthetic analogues (Nakao *et al.* 1997), oxytocin (Magata *et al.* 2013), oxytocin analogue - carbetocin (Bajcsy *et al.* 2006), methyl ergometrine maleate (Drost 1987) and various herbal uterine cleanser preparations (Thakur *et al.* 2013) are used for promoting uterine involution in cows.

Injection of prostaglandin at the first, second and fourth weeks postpartum had an ecbolic effect that reduced the time of uterine involution in cows (Young *et al.* 1984, Steffan and Hegde 1986). Repeated administrations of PGF₂ α twice daily from days 3 to 13 after calving in cows shortened the time needed for uterine involution by 6 days (Lindell and Kindahl 1983). Khatri *et al.* (2013) concluded that administration of PGF₂ α and oxytocin in postpartum buffaloes accelerated the process of uterine involution, reduced the time period of first postpartum

oestrus and induced early expulsion of fetal membranes in Kundhi buffaloes.

Frequent exposure to oxytocin has been probably associated with hastened uterine involution in lactating cows, because suckling increased the rate of uterine involution (Bar-Peled *et al.* 1995) and administration of oxytocin had induced contractions of smooth muscles in the uterus (Cooper and Foote 1986).

Roberts (1986) opined that postpartum administration of 1-3 mg of ergonovine or other ergot products produced more prolonged rate of uterine contractions than oxytocin in cows. In buffaloes, methyl ergometrine maleate produced firm prolonged contraction of the endometrium that lasts for 3-4 hours followed by gradual relaxation over a period of 1.5 hours (Drost 1987).

MATERIALS AND METHODS

Thirty six (36) normally calved healthy Holstein Friesian crossbred cows aged between 2nd and 5th lactations were selected. Day of parturition was

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considered as day 0 of the experiment. On day 2 postpartum, cows of group I animals were treated with intramuscular injection of 25 mg PGF₂α (Dinoprost Tromethamine 5ml, Lutalyse®, Pfizer Animal Health India Ltd, India), group II were treated with 50 IU oxytocin (10 ml, Syntophar®, Interphar Healthcare Pvt. Ltd., Chandigarh, India), group III were treated with 5 mg methyl ergometrine maleate (5 ml, Utrasafe®, Vet Mankind, New Delhi, India) and group IV were treated with 5 ml normal saline (Parental drugs (India) limited, Indore, Madhya Pradesh, India). On day 45-55 postpartum, all the experiment and control cows of four groups were inserted with Controlled Internal Drug Release device (CIDR, EAZI – BREED, Pfizer Animal Health Ltd, India).

RESULTS AND DISCUSSION

The various percentages of conception rate obtained following the treatment of uterotonics and CIDR in cows are presented in Fig. 1. The first service, second service and overall first and second service conception rates were 44.44, 22.22 and 66.66 in group I; 11.11, 33.33 and 44.44 in group II; 22.22, 33.33 and 55.55 in group III and 11.11, 22.22 and 33.33 in group IV, respectively. The first service conception rate was higher in group I (44.44 per cent) than other three groups. The lowest first service conception rate of 11.11 per cent was recorded in groups II and IV. The second service conception rates were higher and equal in groups II and III (33.33 per cent). The overall first and second service conception rate was highest in group I (66.66) followed by group III (55.55), group II (44.44) and group IV (33.33 per cent). It indicated all the uterine ecbolic drugs caused rapid uterine involution which leadsto improvement in conception rates in treatment groups than control. Among the treatment groups, quicker uterine involution and higher overall conception rate were noticed in group I cows.

The overall first and second service conception rate ranged from 33.33 to 66.66 per cent following oestrus induction with CIDR plus PGF₂α . Similar conception rates were reported by Cevik *et al.* (2010) in buffaloes. But, Andurkar and Kadu (1995) recorded 100 per cent conception rate in CIDR plus PGF₂α treated buffaloes. Higher conception rate of 81.25 per cent was obtained by Ganesh (2013) in normally calved postpartum buffaloes. However, Murugavel *et al.* (2009) reported only 27.30 per cent conception rate in buffaloes following CIDR plus Ovsynch protocol. In Gir cows, 50 per cent conception rate was reported by Ramakrishnan *et al.* (2012) with CIDR treatment. In another experiment

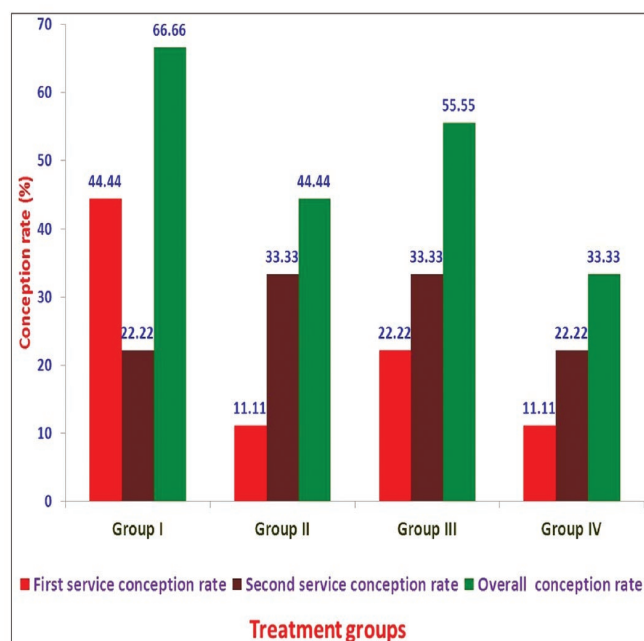


Fig. 1. Conception rates following oestrus induction with CIDR in uterine ecbolic treated cows.

conducted by Ramakrishnan *et al.* (2012) in postpartum buffaloes exhibited first service, second service and overall conception rates as 33.30, 50.00 and 66.00 per cent, respectively.

In this study, the highest percentage of first service (44.44) and overall first and second service (66.66) conception rates were recorded in group I cows treated with PGF₂α on day 2 postpartum followed by oestrus induction with CIDR plus PGF₂α. Numerous studies have reported that postpartum treatment of cows with PGF₂α enhanced the reproductive performances of dairy cows (Khatri *et al.* 2013). Pandey *et al.* (2007) opined that cloprostenol administered in early stage of postpartum life prepared the uterus well due to its myometrial activity and therefore cows could be able to resume their normal physiological secretions and this overall preparation of the uterus favored better conception rate. It was reported that exogenous PGF₂α enhanced immune functions or increased the uterine motility to help the uterus resolve infections in animals that did not have active corpora luteal (Hirsbrunner *et al.* 2003). These observations might explain the improved conception rate in group I cows of this study. Further, decreased PMNs from day 2 postpartum and increased lymphocytic infiltration, rapid involution and predominant regenerative changes of endometrium and absence of uterine infection as indicated by B and T lymphocyte markers were found to be the evidences of high degree

of uterotonic effects of PGF₂α in the present study.

In group II cows, treatment with oxytocin on day 2 postpartum followed by oestrus induction using CIDR plus PGF₂α resulted in overall first and second service conception rate of 55.55 per cent. Large number of studies reported the uterine ecobolic effect of oxytocin in postpartum cows (Bar-Peled *et al.* 1995, Qureshi and Ahmad 2008). Bajcsy *et al.* (2006) stated that intramuscular injection of oxytocin during early postpartum stimulated the PGF₂α release from endometrium which contributed indirectly to enhance the uterotonic effect of oxytocin in cows. Therefore combination of direct and indirect effects of oxytocin might be the reasons for increased conception rate in this group than group III and IV cows of this study (Fig. I).

In group III cows treated with methyl ergometrine maleate on day 2 postpartum followed by oestrus induction with CIDR plus PGF₂α yielded 44.44 per cent conception rate. In this group the conception rate was better than control, but it was lesser than group I and III in this study. Ramoun *et al.* (2006) proved the enhancement of uterine involution due to the prolonged ecobolic effect of methylergometrine maleate in the uterus of buffaloes. Methyl ergometrine maleate produced firm, prolonged contraction of uterus that lasts for 3-4 hours (Roberts 1986) by a gradual relaxation over a period of 1.5 hours (Drost 1987). Comparatively slow and less degree of uterine involution in group III than group I and II might be reason for reduced conception rate in group III cows of this investigation.

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Conception rate in postpartum cow using CIDR along with uterine ecbolics

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