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Research Paper

COMPARATIVE EFFICACY OF OVSYNCH AND CIDR PROTOCOL ON ESTRUS RESPONSE AND CONCEPTION RATE IN ANESTRUS BUFFALOES

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The aim of the present study was to compare the effect of two estrus synchronization treatments, i.e., Ovsynch alone and Controlled Internal Drug Release (CIDR), on the occurrence of estrus and conception rate in local anestrus murrah buffalo during non breeding season in Ranchi Veterinary College. Eighteen buffaloes were randomly selected and were divided into three groups; The buffaloes of Group I (n = 6; CIDR) received 2 mL GnRH on day 0 along with implantation of CIDR. On day 7, the CIDR was removed, and 5 mL PGF2 α analogue was injected through i/m route. Group II (n = 6; Ovsynch) received 2 mL GnRH intramuscularly (i/m) on day 0 and 9. On day 7, 5 mL prostaglandin F2 α (PGF2 α analogue) was administered through i/m route. Group III (n=6; control) received 5 mL normal saline through i/m route on day 0 and 9. The buffaloes of all three groups were artificially inseminated twice using frozen-thawed semen. Estrus response differed significantly (P<0.05) among the groups. The animals of Group I (83.33%) showed superior estrus response as compared to others. Higher conception rate (50.00%) was observed in the animals of Group I; however, the difference was not significant. In conclusion, CIDR causes to occur better estrus response and conception rate as compared to Ovsynch alone in buffaloes.

Keywords: Synchronization treatments, Ovsynch, CIDR

INTRODUCTION

Low reproduction potential of buffalo has been a major concern for decades (Kumar *et al.*, 2014). This is thought to be because of late maturity, poor expression of estrus, variable estrus duration, and prolonged intercalving interval. Several methods of estrus synchronization have been developed in bovine (Yusuf *et al.*, 2010; and

Ahmad *et al.*, 2011). Most commonly used estrus/ovulation synchronization protocols include progesterone, prostaglandin F2 α (or PGF2 α analogs), and estrogens alone or in assorted combinations (Stevenson *et al.*, 2012; and Paul *et al.*, 2015). Use of GnRH in synchronization of estrus causes ovulation or luteinization of large follicles present in the ovary, and subsequently

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synchronizes the recruitment of new follicular wave (Mehmood *et al.*, 2012). Administering the first GnRH in absence of a dominant follicle leads no Corpus Luteum (CL) at the day of PGF2 α inj., which may cause estrus around the day of PGF2 α inj (Islam, 2011; and Ghosh *et al.*, 2012). Therefore, administration of exogenous progesterone during the period between GnRH and PGF2 α is suggested by Cerri *et al.* (2009). Involving CIDR in the protocol prevented the onset of premature estrus (Khumran *et al.*, 2012), and a CL with normal life-span was formed following CIDR removal. Inclusion of CIDR in a protocol to synchronize ovulation suppressed estrus during CIDR insertion, thereby allowing a 100% submission rate for TAI without affecting fertility (Rivera *et al.*, 2005). Therefore, this study was designed to investigate the estrus response and FTAI pregnancy rate in anestrus Murrah buffaloes using different estrus synchronization protocols.

MATERIALS AND METHODS

The study was conducted on Eighteen Indian buffaloes (age: 3-6 years) reared at Instructional dairy farm, Ranchi Veterinary College, Kanke and local khatals near Kanke, Ranchi. Animals with smooth and quiescent ovaries were identified. The selected animals were allotted to 3 groups consisting of 6 animals in each group and subjected to the therapeutic management as per the following protocol. Group I: CIDR Protocol (n = 6) An Intravaginal device (0.96 g hydroxyprogesterone in elastic rubber molded over a nylon spine) was inserted into vagina with the help of the applicator and was kept in situ for 7 days. The CIDR device was removed on 7th day and 2 ml of PGF2 α (Cloprostenol I.P 263 mcg) was injected I.M on the 7th day after removal of CIDR device. Fixed Time Artificial Insemination (FTAI) was done with frozen thawed semen 48

hrs. after the withdrawal of the device. Group II: Ovsynch Protocol (n = 6) The animals of this group was treated under Ovsynch protocol where 5 ml GnRH analogue (Buserelin IP – 0.004 mg) was injected I.M to each animal on day 0 followed by 2 ml PGF2 α analogue (Cloprostenol IP 263 mcg) on day 7th. Again, on day 9th 5 ml of GnRH analogue was injected and all the animals were inseminated with frozen semen after 24 hrs (FTAI) on 10th day. Group III: Anestrus Control (n = 6) Six normal but acyclic buffaloes each were injected with normal saline; 5 ml, i/m, on days 0 and 9. They were followed for onset of natural estrus and insemination. All animals of this group were fed 50 gr. of mineral mixture daily for 15 days.

Heat detection and artificial insemination: The animals of all the three groups were observed closely from the day of treatment for behavioral changes to confirm the heat. The animals were artificially inseminated in all groups using frozen-thawed semen. The pregnancy was confirmed per rectum after 60 days of AI.

The estrus induction response and conception rates of animals of different groups were compared by t-test and Chi Square test.

RESULT AND DISCUSSION

The estrual induction response in CIDR group was higher (83.33%) compared to Ovsynch group (66.66%) and Control group (0%). The oestrus induction response of 66.66% achieved with Ovsynch protocol in the present study is in harmony with the result of Shivajibhai (2016) where in induction rate recorded 75%. However, some researchers reported 100% oestrus response with Ovsynch protocol in anoestrous buffaloes. Ali and Fahmy (2007) and Vikas *et al.* (2016), while other documented considerably lower oestrus induction response of 50% (Ali

et al., 2012a) and 35% (Azawi *et al.*, 2012a). The oestrus induction response of 83.33% achieved with CIDR application in anoestrus buffaloes in the present study was comparable with Lakra *et al.* (2003) (83.33%), Azawi *et al.* (2012a) (75-100%), Kajaysri (2015) (90%) and Shivajibhai (2016) (83.33%). However, the oestrus induction rate was lower than the findings of Singh (2003) (100%).

The mean oestrus induction interval from last injection of PGF2 α /GnRH were 55.88 \pm 2.18 and 57.80 \pm 2.01 hours respectively with CIDR and Ovsynch protocol which are almost similar with the earlier reports of Salvalia *et al.* (2013) and Buhecha *et al.* (2016a) in anoestrus buffaloes, while relatively shorter oestrus induction interval of 39.60 \pm 2.35, 44.00 \pm 2.92 and 48.29 \pm 3.85 hour were observed in buffaloes by Ali *et al.* (2012a), Kundalkar *et al.* (2014) and Kajaysri *et al.* (2105) respectively using CIDR protocol. However, the longer oestrus induction interval of 77.8 \pm 5.6 hrs. and 93.4 \pm 8.4 hrs. have also been documented in anoestrus buffaloes by Azawi *et al.* (2012a) than the present finding with CIDR protocol. Escalante *et al.* (2013) reported that early initiation of estrus

in CIDR implant have resulted decrease in threshold value of circulating progesterone when exogenous source was removed. During progesterone dominance, dominant follicle persists and after removal of the implant more oestrogen is released with exhibition of oestrus followed by ovulation as it stimulates the hypothalamus pituitary gonadal axis. Overt oestrus behaviour and longer duration of oestrus in CIDR group is suggestive of optimum oestrogen and progesterone balance which positively stimulates hypothalamus for initiating cyclic oestrus. Oestrogen is the principle hormone for cyclic oestrus behaviour and the effect is more pronounced if reproductive system is earlier primed with progesterone (Roberts, 1971; and Hafez and Hafez, 2000).

CONCEPTION RATE

During the present study first insemination conception rate was recorded to be 50% and 33.33% in CIDR and Ovsynch protocol where 5 and 4 buffaloes were served by frozen semen respectively. Earlier workers reported higher conception rate following intravaginal CIDR

Table 1: Estrus Induction Response and Estrus Induction Interval in Anestrus Buffaloes Under Different Treatment Protocol


| Oestrus Characteristics \bar{E} | No of Buffaloes | Oestrus Induction Responses | Last Injection to Oestrus Induction Interval (hrs.) |
|-----------------------------------|-----------------|-----------------------------|---|
| Experimental Groups \bar{E} | | | |
| Group 1 (CIDR) | 6 | 5/6 | 55.88 \pm 2.18 |
| | | 83.33% | |
| Group 2 (Ovsynch) | 6 | 4/6 | 57.80 \pm 2.01 |
| | | 66.66% | |
| Group 3 (Control) | 6 | 1/6 | - |
| | | 16.66% | |
| t value | - | - | NS (0.649) |

Note: NS non-significant.

Table 2: Effect of CIDR and Ovsynch Protocols on Conception Rate

| Conception Rate \bar{E} | No. of Buffaloes | No. of Animal in Heat and Inseminated | No. of Animal Conceived | Conception Rate | Chi Square Value |
|---------------------------|------------------|---------------------------------------|-------------------------|-----------------|------------------|
| Treatment Group \bar{E} | | | | | |
| Group 1 (CIDR) | 6 | 5 | 3 | 50% | NS (3.877) |
| Group 2 (Ovsynch) | 6 | 4 | 2 | 33.33% | |
| Group 3 (Control) | 6 | 1 | 0 | 0% | |

compared to other synch therapies in anoestrus animals. Sakase *et al.* (2005) (70.8 vs. 48.6), Nash *et al.* (2014) (40.0 vs. 23.0), Ergene (2012) (60.0 vs. 47.05) and Azeveda *et al.* (2014) (40.03 vs. 33.33) observed higher conception rate in CIDR+PGF_{2 α} treated animals compared to other form of oestrus induction therapies and the higher conception rate observed in the CIDR group during the present study engrossed the finding of above workers. However, slightly lower conception rate was also reported in CIDR treatment group against synch protocol by Bisinotto *et al.* (2015) (39.7 vs. 36.6). Reports on conception rate in anoestrous buffaloes during low breeding (summer) and peak breeding season (winter) with different synch protocols are variable. Baruselli *et al.* (2002) and Tiwari *et al.* (2005) documented 28.2 to 35-29% conception rate in low breeding season. Karena and Darwish (2010), Azawi *et al.* (2012a) and Baruselli *et al.* (2012) recorded further low conception rate (0-7%) in anoestrus buffaloes. Furthermore, conception rate in peak breeding season has been reported ranging from 30.0 to 37.5% by earlier researcher Paul and Prakash (2005), Ali and Fahmy (2007), Savalia *et al.* (2013) and Buhecha *et al.* (2016).

The findings of this study indicate that CIDR protocol of estrus synchronization produces better results and improves the conception rate in anoestrus Murrah buffaloes in comparison with Ovsynch alone. 

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