TREATMENT OF POSTPARTUM ANESTRUS BUFFALOES WITH CONTROLLED INTERNAL DRUG RELEASING (CIDR) DEVICE AND ITS COMBINATIONS

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ABSTRACT

The present study was conducted to know the effect of CIDR and it's combinations with prostaglandin $F_2\alpha$ ($PGF_2\alpha$) and gonadotrophin releasing hormone (GnRH) in postpartum anestrous buffaloes in terms of estrus signs, estrus induction rate and pregnancy rate. Thirty two healthy Graded Murrah buffaloes were selected after clinical, gynaecological and ultrasonographic examination and divided in to 4 groups comprising of 8 animals in each group viz. Group 1 (Control, not received any treatment), Group 2 (CIDR inserted intravaginally for 10 days), Group 3 (CIDR insert for 10 days plus 500 µg cloprostenol i/m on 9th day) and Group 4 (CIDR insert for 10 days, 500 µg cloprostenol i/m on 9th day and 10 µg of Busereline 24 hours after CIDR removal). The animals detected in estrus were bred through AI. The group 4 buffaloes exhibited estrus in 67.10 ± 12.5 hrs after CIDR removal with higher estrus induction (87.5%) and pregnancy rate (87.5%) than other groups.

KEYWORDS: Buffalo, Postpartum anestrous, CIDR, $PGF_2\alpha$.

INTRODUCTION

Postpartum anestrus is the period after parturition during which the buffalo do not exhibit behavioral signs of estrus and is a major cause for economic loss to the buffalo industry (Azawi *et al.,* 2012). Longer inter calving period in buffaloes are mainly due to postpartum anestrum which is mainly due to ovarian inactivity (Zaabel *et al.,* 2009). Several studies have been conducted to treat the postpartum anestrum in buffaloes by using hormones like gonadotrophin releasing hormone (GnRH), estrogen (E_2) and prostaglandin $F_2\alpha$ ($PGF_2\alpha$) and progesterone (P_4) (Singh, 2003; Zaabel *et al.,* 2009; Azawi *et al.,* 2012). The present study was undertaken to test the efficacy of CIDR alone or in combination with other hormones on pregnancy rate of anestrus graded Murrah buffaloes.

MATERIALS AND METHODS

The study was conducted on a private dairy farm of Thottiam Taluka of Trichy District. Thirty two healthy Graded Murrah buffaloes between 2nd to 4th lactation that had not exhibited estrus signs since 8 months of postpartum were selected for this study. The animals were healthy, regularly dewormed and vaccinated. The buffaloes were examined per rectum and by ultrasonography at 10 days interval for identifying ovarian inactivity for the absence of follicle and corpus luteum on both the ovaries (Ramoun and Darwish, 2006; Zaabel *et al.,* 2009). Ultrasonographic examination was carried out according to Dahiya *et al.* (2003) and Terazano (2005) using real time B-mode ultrasound scanner equipped with 5 MHz trans rectal linear array transducer. The selected animals were divided into 4 groups Group 1 (not received any treatment, control, n=8), Group 2 (treated with progesterone in the form of CIDR (CIDR® cattle insert, Pfizer New Zealand Ltd., 1.38 g) intravaginally for 10 days, n=8), Group 3 treated with CIDR for 10 days intravaginally and

intramuscular injection of cloprostenol (Pragma®, Intas Pharma, 500 µg) on 9th day of CIDR insertion, n=8), Group 4 (treated with CIDR for 10 days intravaginally and intramuscular injection of cloprostenol on 9th day of CIDR insertion and 10 µg of Busereline, Receptal® VET, Intervet international, 2.5 ml, intramuscular, 24 hrs after CIDR removal, n=8)

The animals detected in estrus were bred by artificial insemination with semen of proven bull. Pregnancy diagnosis was carried out after 60 days by rectal examination. The estrus induction rate (EIR), treatment estrus interval (TEI) and overall pregnancy rate (OPR) were calculated with the collected data.

RESULTS AND DISCUSSION

None of the CIDR devices were lost during the experiment. In control animals none has exhibited heat signs. In group 2, five out of eight anestrus buffaloes (62.5 %) exhibited estrus within 78.40 ± 19.0 hrs after CIDR removal. Out of eight, three buffaloes conceived with the OPR of 37.5%.

The available reports suggested that dysfunction of the hypothalamic (GnRH) and pituitary gonadotrophins (FSH and LH) were the contributing factors of inactive ovaries (Aboul-Ela *et al.,* 1985; Gordon, 1996). CIDR has been effectively used for estrus synchronization, increased conception rates and the treatment of postpartum anestrus. The estrus exhibition and subsequent ovulation after CIDR removal in group 2 suggests that progesterone had been released from the CIDR and was absorbed through vaginal wall into circulation. This increased circulatory concentration of progesterone exerted negative feedback on hypothalamus and anterior pituitary and favored GnRH, FSH and LH storage. Following CIDR removal, sudden release of GnRH and gonadotrophins might cause the resumption of ovarian activity. Further the increased progesterone concentration has sensitized the hypothalmo-pituitary axis. At the same time progesterone increased the hypothalamus sensitivity to estrogen with subsequent increase in the intensity to heat (Singh, 2003).

7 out of 8 anoestrus buffaloes in group 3 exhibited estrus signs. The estrus expression was earlier (72.06 ± 10.0 hrs) than group 2 buffaloes (78.40 ± 19.0 hrs) with a higher EIR (87.5 vs 62.5%), which concurred with the results of Singh (2003) and Zaabel *et al.* (2009). The pregnancy rate obtained in group 3 (5/8, 62.5%) differed significantly ($P<0.05$) with group 2 buffaloes (3/8, 37.5%). Caesar *et al.* (2011) exhibited estrus within 65.14 ± 11.39 hours with 85.7 % conception rate in anestrus buffalos. Hence it was ascertained that CIDR + $PGF_2\alpha$ combination was effective than inserting CIDR alone. It might be due to that the $PGF_2\alpha$ increases pituitary responsiveness in postpartum buffaloes (Randel *et al.,* 1996) and hence the released GnRH after CIDR removal effectively stimulates the pituitary gonadotrophins with subsequent estrus induction (Zaabel *et al.,* 2009).

The group 4 (CIDR + $PGF_2\alpha$ + GnRH) produced encouraging results than group 3 (CIDR + $PGF_2\alpha$). Seven out of 8 anestrus buffaloes exhibited induced estrus within 67.10 ± 12.5 hrs, and all 7 conceived. Thus, both the EIR (7/8, 87.5%) and conception rate (7/8, 87.5%) obtained in group 4 concurred with the results of Herbert and Trigg (2005) and Peters (2005) and these results were higher than those obtained by Azawi *et al.* (2012) and Rameez Ali *et al.* (2012). This might be due to fact that the supplemental GnRH after 24 hrs of CIDR removal might induce ovulation at appropriate time relative to breeding time and to stimulate leutinization, thereby improving the chances of successful fertilization and embryo survival.

From these results it was concluded that the estrus induction in anestrus buffaloes can be done by either CIDR+ $PGF_2\alpha$ or CIDR + $PGF_2\alpha$ + GnRH treatment, but the conception rate was higher in CIDR + $PGF_2\alpha$ + GnRH protocol, because it not only helps in resumption of ovarian cyclicity but also causes synchronization of ovulation.

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