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RESEARCH ARTICLE

Supplementation of Progesterone in Ovsynch to Improve Fertility in Post-Partum Anestrus Buffaloes

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Abstract

This study was undertaken to evaluate the efficiency of supplementation of progesterone in Ovsynch protocol to improve fertility in post-partum anestrus buffaloes. Twelve healthy lactating anestrus buffaloes were equally divided in group-I and group-II. Group-I buffaloes were treated with Ovsynch protocol and group-II buffaloes were treated with Ovsynch plus CIDR protocol. Timed artificial insemination was done at 12 and 24 hours after second GnRH injection in all treated animals. The efficacy of treatment in terms of estrus induction rate was 100% in both groups, however conception rate was significantly higher ($P<0.05$) in group-II as compared to group-I animals.

Introduction

Reproduction in buffaloes is influenced by season and fertility is reduced in the period of the year of increasing daylight hours due to an environmental effect on the activity of the hypothalamo-hypophysial axis (Rensis *et al.*, 2005). During seasonal anestrus, resumption of post-partum ovarian activity is significantly delayed compared to during the breeding season and interval from parturition to first estrus is prolonged compared to rest of the year (Singh and Nanda, 1993). Several hormonal protocols that are effective at inducing ovarian activity, estrus behavior and controlling ovulation have been employed in treatment of these anestrus animals. Ovsynch potency during low breeding season is questionable. However, inclusion of progesterone for 7 days between first GnRH and $PGF_2\alpha$ increases fertility during low breeding season (Ravikumar *et al.*, 2005). Keeping this in view present study was designed to evaluate the efficacy of progesterone supplementation in Ovsynch protocol in anestrus buffaloes.

Material and Methods

Twelve healthy non-cyclic Murrah buffaloes with a post-partum interval of more than 90 days and aged between 3.5-8 years were selected from R. S. Pura and adjoining villages. The average body condition score (Edmonson *et al.*, 1989) of animals was 3.5 (1 = thin, 5 = fat) with parity 1-3. Buffaloes were gynaeco-clinically examined for confirmation of anestrus, with smooth ovaries by two per-rectal examinations 7 days apart. The selected buffaloes were assigned to two groups, each group having six animals. Animals in group I were treated with ovsynch protocol. These animals were subjected to administration of 10 µg i.m. injection of GnRH (Buserelin acetate, Receptal Vet, Intervet) on day of start of treatment (day 0), 25 mg i.m. injection of $PGF_2\alpha$ (Dinoprost tromethamine, Lutalyse, Pfizer) seven days later (day 7), another 10 µg i.m. injection of GnRH 48 hours after $PGF_2\alpha$ (day 9) and timed insemination at 12 and 24 hours after second GnRH injection (day 10). Animals in group II were treated with Ovsynch plus CIDR protocol. These animals were treated with ovsynch protocol as in group I and in addition CIDR-B device (EAZI BREED CIDR^{TM}, DEC International Ltd., Hamilton, New Zealand) was placed in vagina for a period of 7 days starting from first GnRH injection (day0) to $PGF_2\alpha$ injection (day 7). The experimental buffaloes were frequently observed for estrus signs after $PGF_2\alpha$ injection. Onset of estrus was calculated in hours from the time of

$PGF_2\alpha$ administration and/or CIDR removal to appearance of first estrus signs. The intensity of estrus was studied using behavioral changes, physiological changes and gynaecological observations and it was scored as described by Rao and Rao (1981) with slight modifications. First service conception rate was calculated as percentage of animals concieved to fixed-time insemination at induced estrus in each group. Pregnancy was confirmed by per-rectal palpation at 60 days post insemination.

Result and Discussion

Estrus induction rate, onset of estrus, intensity of estrus and first service conception rates are presented in table 1. The efficacy of treatment in terms of estrus induction rate was 100% in both treatment groups. These results are in close proximity with those of Xu and Burton (2000), Campanile *et al.*, (2005) and Prakash *et al.*, (2008) who reported an estrus induction rate of 86-93% in cows and buffaloes treated with similar protocols. However lower estrus induction response has been reported by Ravikumar *et al.* (2005) who reported estrus induction rate of 41.66% and 58.33% in Ovsynch and Ovsynch plus CIDR treated subestrus buffaloes, respectively. This variation in estrus detection rate recorded in present study as compared to earlier reports might possibly be due to breed of animal, environmental conditions, managemental factors and plane of nutrition.

Table 1: Estrus induction rate, onset of estrus, intensity of estrus and first service conception rate in anestrus buffaloes treated with Ovsynch and Ovsynch plus CIDR.

S.No.	Group	No. Of animals treated	Estrus detection rate	Time required for onset of estrus (hours)	Intensity of estrus			First service Conception rate (%)
					Intense	Intermediate	Weak	
1	Ovsynch	6	6/6 (100)	56.67 ± 3.12[a]	1/6 (16.67)	3/6 (50.00)	2/6 (33.33)	2/6 (33.00)[a]
2	Ovsynch +CIDR	6	6/6 (100)	57.25 ± 4.02[a]	2/6 (33.33)	3/6 (50.00)	1/6 (16.67)	4/6 (66.67)[b]

Values with different superscripts differ significantly (P<0.05)
Figures in parenthesis indicate percentage

The average time required for onset of estrus was 56.67 ± 3.12 and 57.25 ± 4.02 hours in Ovsynch and Ovsynch plus CIDR treated buffaloes, respectively. There was no significant difference (P>0.05) with regard to time required for onset of estrus among two treatment groups. This agrees to the previous observation of Sathiamoorty and Subramanian (2003) and Vijayarajan *et al.* (2009) who reported the time required for onset of estrus to be 45.5 ± 5.5 and 51.8 ± 2.49 hours in buffaloes treated with Ovsynch protocol. The intensity of estrus is almost same in Ovsynch and Ovsynch plus CIDR groups, which confirms the observations of Ravikumar *et al.* (2005).

The first service conception rate in Ovsynch and Ovsynch plus CIDR treated buffaloes was 33.00% and 66.67%, respectively. It was significantly higher (P<0.05) in Ovsynch plus CIDR treated than Ovsynch treated buffaloes. Neglia *et al.*(2003) and Warriach *et al.* (2008) reported first service conception rate of 36.00% and 30.40%, respectively using Ovsynch protocol, while Sakase *et al.* (2005) and Schafer *et al.* (2007) reported 67.70% and 66.00% conception rate, respectively in cows treated with Ovsynch plus CIDR hormone protocol. Ali *et al.* (2012) also reported conception rate of 60% in Ovsynch plus CIDR protocol treated post-partum anestrus buffaloes which was fairly higher as compared to 33.33% in Ovsynch treated buffaloes. This significant difference in the conception rates between the two hormone protocols indicates the role of exogenous supplementation of progesterone in Ovsynch plus CIDR hormone protocol. The beneficial effects of progesterone supplementation particularly in lutael phases is well documented. El-Zarkouny *et al*. (2004) reported positive association of pregnancy rates with higher progesterone concentration in the luteal phase of the cycle

preceding artificial insemination. It has also been proved that decrease in plasma progesterone concentration can occur in animals given their first GnRH treatment late in estrous cycle. In addition, ovulation induced by GnRH administration results in a pre-mature luteal regression in a high proportion of animals and this may be avoided by priming the animals with exogenous progesterone (Rosenberg *et al*., 1990; Kawate *et al*., 2004). In conclusion, the supplementation of exogenous progesterone to the Ovsynch protocol improves conception rate and enhances fertility in post-partum anestrus buffaloes.

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