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Research Article

EFFECT OF HORMONAL TREATMENT ON ESTRUS RESPONSE AND FERTILITY IN ANESTRUS BUFFALOES

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ABSTRACT

Two hundred and eighty non-cycling post-partum buffaloes and heifers maintained by individual farmers were used in the present study that was conducted during breeding season during the years 2002 to 2004. Treatment of buffaloes either with single or two injections of 20 ig GnRH, 1000 I.U. eCG and 25mg PGF_2á resulted in induction of estrus in 82, 55 and 66% of the treated animals with first service conception rate of 52%, 32% and 66%, respectively. Thus, it is concluded that treatment of anestrous buffalos with GnRH, eCG and PGF2a could be helpful in induction of fertile estrus in anestrous buffaloes under field conditions.

Key words: Hormonal treatment, anestrus buffaloes

Major problems of the buffaloes are silent estrus, delayed puberty, long post-partum ovarian inactivity and on the whole poor fertility (Madan, 1998, Singla *et al.*, 1996). Moreover, seasonality and factors like nutrition and suckling also result into long calving interval (Porwal *et al.*, 1981). The signs of estrus are less intense in buffaloes than cattle and are even weaker during low breeding season (Raizada and Pandey, 1981). Various hormones have been used to induce cyclicity in acyclic buffaloes but with variable results (Dabas *et al.*, 1989, Shah *et al.*, 1992, Rohilla, 2003). Moreover, most of the available information on estrus induction pertains to buffaloes maintained under farm conditions and very little is known about induction of estrus in buffaloes maintained under field conditions, where management is entirely different from farm conditions. Therefore, the present study was conducted to determine the effect of hormonal treatment on fertility response of anestrus buffaloes maintained under varied managemental conditions in rural areas.

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MATERIALS AND METHODS

The present study was conducted during October to February months of the years 2002 to 2004. A total of 280 post-partum buffaloes including heifers maintained by individual farmers at two adopted villages of Krishi Vigyan Kendra, Panipat, were selected at random. The population under study was genetically heterogeneous with Murrah and non-descript buffaloes.

All the animals were in good health and had apparently normal genitalia. The animals had a history of anestrus with no observation of vaginal discharge and mating for the last 6-9 months. Ovarian status was confirmed by rectal palpation carried out at 10 days interval, which revealed presence of either smooth ovaries or a corpus luteum (CL). Animals were fed according to their individual requirement by respective owner. Based on observations of ovarian palpation, these animals were divided into two categories. In the first category (C1), animals having smooth ovaries (n=220) were included, whereas the second category (C2) consisted animals having a CL (n=60) on either of the ovaries. Out of the total 220 animals having smooth ovaries, 100 buffaloes (C1) received 1000 I.U. eCG (Folligon, Intervet) i/m. The remaining 120 animals (C1a)

with smooth ovaries were administered 20 μg GnRH (Receptal, Intervet) i/m. Out of these 120 treated animals, 87 animals (C1b) that failed to respond to 1st GnRH injection, also received 2nd GnRH injection at 15 days interval. All the buffaloes included in the second category (C2, n=60) received 25 mg $PGF_2\alpha$ (Lutalyse, Upjohn) i/m as single injection.

Immediately following the treatment, farmers were advised to observe the signs of estrus carefully in the morning, mid-day and in the evening, daily for 15 days. After observing the signs, buffaloes were presented to fertile bull for mating. To evaluate fertility in different treatment groups, estrus response (number of total treated females exhibiting estrus), first service conception rate (no. of females conceiving at first service out of total mated), over all conception rate (no. of females conceiving, including those conceiving at 2nd and 3rd mating of total inseminated), and pregnancy rate (no. of females conceiving of total treated) were calculated for each group. Pregnancy diagnosis was made by palpation per rectum, 55-65 days after mating.

RESULTS AND DISCUSSION

Various hormonal preparations have been used to induce cyclicity in anestrus buffaloes. In the present study, three hormonal regimens viz. GnRH, eCG and PGF_2á were used for induction of estrus in acyclic buffaloes under field conditions (Table 1). After the treatment with 1000 I.U. eCG, 55% of the buffaloes exhibited estrus with 36% first service conception rate (Table 1). A highly variable fertility response has been reported in eCG treated acyclic buffaloes. Using 1500 or 3000 I.U. of eCG, Dabas *et al.* (1989) reported 100% estrus response with 60 or 40% conception rate, respectively in anestrous buffalo heifers. However, Shah *et al.* (1992) reported 37.5% conception rate in eCG treated Surti buffalo heifers. These results are comparable to that of the present findings.

Following GnRH injection, 28% of females exhibited estrus within 15 days and 48% conceived at the induced estrus (Table 1). However, following the administration of 2nd GnRH injection in animals not responding to 1st GnRH injection, 73% buffaloes exhibited estrus with first service conception rate of 54%. Over all, out of the 120 acyclic buffaloes with smooth ovaries and receiving one or two GnRH injections, 82% exhibited estrus with 52% first service conception rate following natural mating (Table 1). A 70-100% estrus response with 60-70% conception rate following treatment with single injection of 20 μg GnRH has been reported in post-partum buffaloes (Nasr *et al.*, 1983, Mohammad *et al.*, 1999). Nevertheless, using two injections of GnRH (50 μg and 100 μg) administered at an interval of 10 days, a high estrus and conception rate was reported in post-partum cattle (Humbolt and Thibier, 1980).

In the present study, 60 females were found to have CL on one of the ovaries on rectal palpation. Interestingly, these animals were never

Table 1
Reproductive parameters in different categories of anestrus buffaloes

Category/Treatment	No. of animals examined (n)	No. in estrus within 15 days (%)	First service conception rate (%)	Over all conception rate (%)**	Pregnancy rate (%)
C1: ECG, 1000 I.U.	100	55/100 (55)***	20/55 (36)	55/55 (100)	55/100 (55)
C1a: GnRH, 20 μg 1st Injection	120	33/120 (28)	16/33 (28)	33/33 (48)	33/120 (100)
C1b: GnRH,20 μg, & 2ndInjection as booster	87*	65/87 (73)	35/65 (54)	65/65 (100)	65/87 (73)
C2: $PGF_2\alpha$, 25 mg	60	40/60 (66)	40/60 (66)	40/40 (100)	40/60 (66)

* Includes those females which failed to exhibit estrus within 15 days after 1st GnRH injection.
** Including those conceiving at 2nd and 3rd matings, *** Figures in parenthesis indicate percentage

detected in estrus by the owners, possibly due to weak or silent/sub-estrus with weak signs of heat. A weak/silent or unobserved and non-standing estrus is common even in spontaneously cycling post-partum buffaloes (Khatab *et al.*, 1988, Barakawi *et al.*, 1997) which may go undetected even by teaser bull (Singh *et al.*, 1984). Such animals can be effectively managed by synchronization of estrous, using a luteolytic agent. After the administration of 25 mg $PGF_2\alpha$, 40 of the 60 (66%) females exhibited estrus and conceived. Almost comparable to that of present findings, Subramaniam *et al.* (1991) reported 75% estrus response with 50% conception in $PGF_2\alpha$ treated rural buffaloes having CL on the ovary. It can be inferred from the present study that treatment of anestrous buffaloes (smooth ovaries) either with GnRH or eCG and the animals having a CL with $PGF_2\alpha$ could be helpful in induction of fertile cycle in non-cycling buffaloes under field conditions.

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