

POSTPARTUM ANOESTRUS IN NILI-RAVI BUFFALOES MAINTAINED UNDER RURAL AND PERI-URBAN MANAGEMENT

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ABSTRACT

The trial was conducted to assess anoestrous problem in Nili Ravi buffaloes kept under rural and peri-urban management around Islamabad, during the months of October to December. One hundred and three buffaloes under peri-urban management and 40 buffaloes under rural management belonging to six and 21 farmers, respectively, were included in this study. Buffaloes that did not show heat signs for 6-12 months postpartum were considered anoestrus in this study. For inducing heat, two injections of cloprostenol were administered in silent oestrous buffaloes, whereas gonadotropin releasing hormone followed by cloprostenol was administered in true anoestrous buffaloes. A higher proportion of buffaloes (35%) was noted in anoestrus under rural than under peri-urban management (17.5%, $P=0.02$). All the buffaloes diagnosed as silent oestrus responded to cloprostenol therapy by showing heat signs under both management systems. However 71% rural buffaloes diagnosed in true anoestrus showed heat symptoms compared to 100% peri-urban buffaloes followed by GnRH+cloprostenol therapy. Fixed time insemination (72 and 96 hours after 2nd cloprostenol injection) resulted in a conception rate of 58% and 67% in rural and peri-urban buffaloes, respectively. An overall 33% conception rate was observed in true anoestrous compared to 83% in silent oestrous buffaloes. It is concluded that cloprostenol could be used successfully to induce heat and achieve an optimum conception rate in silent oestrous buffaloes during peak breeding season.

Keywords: Buffalo, postpartum anoestrus, management system, hormone therapy.

INTRODUCTION

Postpartum anoestrus is one of the major causes of reduced fertility in water buffalo (Rao and Sreemannarayana, 1982; Samad *et al.*, 1984). On the basis of ovarian activity, this phenomenon has been classified as true anoestrus where ovaries are non-cyclic, and silent oestrus where ovaries are cyclic but overt oestrous symptoms are missing. In a peri-urban condition, it was noted that 31% buffaloes remained anoestrus during a 5 month period postpartum (Qureshi *et al.*, 1998). An incidence of 58% true anoestrus and 32% silent oestrus was observed among more than 6000 anoestrous cases recorded over a ten year period (Samad *et al.*, 1984). Occurrence of first oestrus has been recorded in Nili Ravi buffaloes at 183 days postpartum with a range of 21-749 days (Rehman *et al.*, 1991). Long periods of postpartum anoestrus have been recorded in underfed buffaloes, especially during high environmental temperature stresses (Kaur and Arora, 1984), indicating that frequency of anoestrous buffaloes may vary under various management situations.

Buffalo rearing activity has traditionally remained concentrated in canal irrigated region of Pakistan. However, growth of large cities has resulted in

development of peri-urban buffalo farms, in many cases away from their home tract, to cater the needs of milk for urban population. Moreover, popularity of buffalo milk has resulted in spreading of buffaloes to villages of rain fed, hilly areas. However, it has been noted that peri-urban dairy farmers offer better feed to their buffaloes than the rural farmers especially in rain-fed areas like Rawalpindi/Islamabad. This situation may affect productive and reproductive efficiency of buffaloes especially due to a prolonged service period. The present trial was undertaken to assess postpartum anoestrous problem in Nili-Ravi buffaloes under two types of management systems (rural and peri-urban) around Islamabad.

Suitable feeding and management, removing the calf, and oestrus induction with hormones have been proposed as remedies for the anoestrous problem in buffaloes. Use of gonadotropin releasing hormone (GnRH), followed by cloprostenol in buffaloes suffering from true anoestrus (Rao and Venkatramiah, 1991), and administration of two injections of cloprostenol at 11 day interval in silent oestrus cases (Samad *et al.*, 1981) have been reported effective ovulation control methods compatible with normal fertility at induced oestrus. So another objective of the

trial was to study the fertility rate after hormone therapy and fixed time insemination in anoestrous buffaloes.

MATERIALS AND METHODS

The trial was conducted from October to December on Nili-Ravi buffaloes maintained by farmers around Islamabad (latitude 33.7° N, longitude 73.1° E, altitude 508 m). One hundred and three buffaloes belonging to six peri-urban, and 40 buffaloes maintained by 21 rural farmers were included in the study. Peri-urban farmers were located within 10-km radius of the city and rural farmers were at 30-km from the city. Peri-urban farmers provided 6-8 kg concentrate per day per buffalo round the year and *ad-lib* green fodder for most part of the year. The rural farmers fed 3-4 kg concentrate and dry roughages to a milking buffalo. The concentrate in both cases comprised cotton seed cakes and wheat bran (3:1). Grazing along water channels was provided in both cases during rainy season and spring. Peri-urban farms had approach to better veterinary services than rural farms. Average number of buffaloes was higher with peri-urban than rural farmers (17.2 ± 9.3 vs 1.9 ± 0.6).

A postpartum anoestrous buffalo for this trial was defined as a buffalo that did not exhibit signs of oestrus for 6-12 months after calving. Of 32 anoestrous buffaloes, 23 were randomly picked up for examination of ovaries per rectum and hormonal therapy. These buffaloes were in their 1st to 7th lactation. Rectal palpation was made to ensure that the animals were non-pregnant. Ovarian palpation in these buffaloes was performed twice at 11-day interval to assess the presence or absence of a corpus luteum (CL).

A buffalo was declared in true anoestrus if no palpable CL was present on both occasions, and in silent oestrus if a CL was present on the ovaries at least on one of the occasions. True anoestrous buffaloes received 50 µg Lecirelin (a synthetic analogue of GnRH - Dalmarelin 2cc; Fatro, Italy) injection I/M on the day of second palpation followed by cloprostenol 150 µg I/M (Dalmazin 2cc; Fatro, Italy) at day 9 and again at day 20 after GnRH administration. No ovarian palpation was made at the time of cloprostenol injection. The silent oestrous buffaloes received cloprostenol on the day of second palpation and again at day 11 following first injection. Farmers were advised to record the signs of oestrus i.e. restlessness, bellowing and discharge of cervicovaginal mucus. The oestrus was

confirmed by noting hyperemia and moistness of vagina, and characteristic tone of the uterus through rectal palpation at 72 and 96 hours after second cloprostenol injection. Buffaloes found in oestrus were inseminated at 72 and 96 hours after second injection of cloprostenol with frozen thawed semen from a buffalo bull of proven fertility. Pregnancy test was performed 60 days after insemination by rectal examination. Anoestrus percentage was calculated by dividing the number of anoestrous buffaloes by total number of buffaloes with farmers included in the trial. Frequencies of anoestrous buffaloes and conception rate in buffaloes for two types of farmers were compared by Chi square test.

RESULTS

Frequency of anoestrous buffaloes under rural and peri-urban management conditions is presented in Table 1. A higher proportion of buffaloes suffered from anoestrous problem under rural (35%) than under peri-urban management (17.5%, $P=0.02$). Distribution of buffaloes into true anoestrus and silent oestrus classes and their oestrus response to hormonal therapy is depicted in Table 2. All the buffaloes under peri-urban management showed oestrus but under rural management two buffaloes suffering from true anoestrous condition showed no oestrus signs after hormone therapy.

Conception rate after fixed time insemination in 21 buffaloes showing oestrus is presented in Table 3. It did not differ in true anoestrous buffaloes between two types of management (rural 40%, peri-urban 25%; $P = 0.64$). Similarly, silent oestrous buffaloes had non-significant difference in conception rate between rural (71%) and peri-urban (100%) management ($P = 0.19$). However, conception rate was lower in true anoestrous (25%) than silent oestrous animals (100%) in peri-urban ($P = 0.02$) condition. An overall conception rate of 58% and 67% was observed in rural and peri-urban buffaloes, respectively.

DISCUSSION

Postpartum anoestrus in dairy buffaloes results in a prolonged calving interval due to which heavy economic losses are impinged upon livestock farmers. Managemental strategies and hormonal therapy have been proposed as solutions to this problem (Jainudeen and Wahab, 1987).

Table 1. Frequency of anoestrus buffaloes under rural and peri-urban management

Management	Farmers	Total buffaloes	No. and percentage of anoestrus buffaloes
Rural	21	40	14 ^a (35.0%)
Peri-urban	6	103	18 b (17.5%)
Total	27	143	32 (22.4%)

a,b differed significantly (P = 0.02)

Table 2. Distribution and oestrus response of anoestrous buffaloes receiving hormonal therapy

Condition	No. showing oestrus / No. Treated (%)	
	Rural	Peri-urban
True anoestrus	5 / 7 (71.4)	4 / 4 (100)
Silent oestrus	7 / 7 (100)	5 / 5 (100)
Total	12/14(85.7)	9 / 9 (100)

Table 3. Conception rate after fixed time insemination of buffaloes showing oestrus following hormonal therapy

Condition	Number pregnant (%)		
	Rural	Peri-urban	Total
True anoestrus	2 (40%)	1 ^a (25%)	3 (33%)
Silent oestrus	5 (71%)	5 ^b (100%)	10 (83%)
Total	7 (58)	6 (67)	13 (62)

Values in a column with different superscripts differ (P = 0.02)

The frequency of anoestrus occurring in well-fed buffaloes at peri-urban farms (17.5%) was less as compared to the buffaloes receiving less concentrate under rural management (35%) in the present study. It supports the observation of Kaur and Arora (1984) that underfeeding results in greater incidence of postpartum anoestrus in the buffalo. Low energy intake also resulted in reduced ovarian function in dairy (Boyd, 1977) and beef cows (Stagg *et al.*, 1995). Thus, a higher incidence of anoestrus among rural buffaloes could be due to the factor that grazing and concentrate offered to them did not meet the energy requirements of the animals.

True anoestrous buffaloes were treated with an injection of GnRH analogue followed by cloprostenol at day 9 and day 20 in the present trial. It has been shown that a single exogenous GnRH injection elicits a preovulatory type surge release of LH and FSH from the pituitary gland in cattle (Zolman *et al.*, 1974). Although silent ovulations and short cycles of 9-13 days have been reported following GnRH in anoestrous beef cows (Lishman *et al.*, 1979; Kesler *et al.*, 1980), newly recruited follicles and luteal structures sensitive to cloprostenol are available for a precised oestrous synchronization seven days after GnRH injection

(Thatcher *et al.*, 1989). There is also evidence of silent ovulation and presence of luteal structures in a majority of anoestrous water buffaloes after administration of GnRH, and these luteal structures responded to cloprostenol given 7 days after GnRH (Rao and Venkatramiah, 1991). In the present trial, administration of GnRH and cloprostenol induced oestrus in 100% peri-urban buffaloes suffering from true anoestrus but only in 71% of rural buffaloes with true anoestrus. This observation indicates that adequate nutrition might be needed along with hormonal therapy to combat the anoestrous phenomenon in the buffalo.

A better conception rate in silent oestrous buffaloes as compared to true anoestrous ones in the present trial shows that silent oestrous buffaloes had normally cycling ovaries. They responded to cloprostenol therapy resulting in an optimum oestrus and conception, both in peri-urban and rural management systems. However, it seems that buffaloes have to be relieved from stress (e.g. nutrition deficiency, parasitic infestation etc.) in case of true anoestrus to achieve a conception rate comparable to that in silent oestrous buffaloes.

A higher incidence of anoestrus and a lower overall conception rate in rural buffaloes underlines the necessity for improvement in the plane of nutrition in

such buffaloes. Cloprostenol could be used successfully in the buffaloes to induce heat and achieve pregnancy after fixed time insemination in silent oestrous buffaloes under both rural and peri-urban systems during peak breeding season.

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