SHORT COMMUNICATION

Efficacy of Ovsynch Protocol with Double Dose of GnRH in Postpartum Anestrus Mehsana Buffaloes

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Abstract

The present study compared the efficacy of the Ovsynch and modified Ovsynch protocols in enhancing fertility in anestrus postpartum Mehsana buffaloes. Sixteen buffaloes were selected and randomly divided into two groups: Group I and Group II. Both groups were treated with the Ovsynch protocol, with a modification in the dose of GnRH in Group II, which received a double dose of GnRH, 20 µg (5 mL) buserelin acetate, instead of 10 µg (2.5 mL), intramuscularly. The buffaloes underwent FTAI at 12 to 24 h post-second buserelin acetate injection. The rate of induced estrus was recorded as 100 % in both groups. The estrus duration and conception rate were higher in Group II than in Group I (21±1.96 vs 20.25±1.94 h; 87.50% vs 75.00%, respectively). It is concluded that the double dose of GnRH analogue used in the Ovsynch protocol improved estrus duration and conception rates in postpartum anestrus Mehsana buffaloes, with equal estrus induction efficacy.

Key words: Anestrus, Buffalo, Conception rate, Estrus, GnRH, Ovsynch.

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Introduction

Milk production in buffaloes is influenced by various reproductive disorders, among which anestrus directly affects total milk production and the tendency of individual animals to produce calves per year during the postpartum period. This condition may result in suppression of follicle-stimulating hormone release due to lactation, nutrition, and systemic diseases, leading to smooth, small, inactive ovaries and the absence of CL (Agarwal *et al*., 2004), or to persisting CL in cases of uterine pathology and early embryonic death. El-Wishy *et al*. (2007) observed a 31 to 42% incidence of postpartum anestrus after 150 days of calving. In buffaloes, detecting estrus is challenging due to less pronounced heat signs and silent heat, which complicate artificial insemination (AI). Furthermore, estrus synchronization with timed AI is not preferred due to variability in ovulation timing. Several estrus synchronization protocols, such as ovsynch, co-synch, heat-synch, and double heat-synch, are in use with variable success in managing the follicle, CL, and ovulation, employing combinations of GnRH, PG, and Estradiol injections with FTAI (Pursley *et al*., 1995).

The Ovsynch protocol is a relatively recent system for synchronizing estrus in postpartum animals. Its efficacy depends on the stage of follicular development at the time of the initial GnRH injection. Fertility with the Ovsynch protocol is highest when buffaloes ovulate in response to the first GnRH injection (Pursley *et al*., 1997). However, in non-cyclic buffaloes, Ovsynch is less effective at inducing estrus and conception than in cyclic buffaloes. Renesis *et al*. (2005), and Ali and Fahmy (2007) reported that double insemination, administered 0 and 24 hours apart, and progesterone supplementation slightly improve conception rates. However, conception rates at induced estrus were lower with the Ovsynch protocol, even when good mucus discharge and uterine tone were observed (Malik *et al*., 2011). Ovarian function and pregnancy rates increased to 87.4% and 36.8%, respectively, with a modified Ovsynch protocol (Kose and Tekeli, 2014). However, the fertility response to Ovsynch in anestrus buffaloes is not promising (Renesis *et al*., 2005; Malik *et al*., 2011). Thus, there is a need to modify this protocol to improve fertility and field-level applicability. Given the central problem of anestrus in postpartum buffalo, this study examined the effectiveness of a modified Ovsynch protocol in improving fertility in Mehsana buffaloes.

Materials and Methods

Postpartum Mehsana buffaloes that had completed more than 90 days postpartum were scanned per rectum to

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Table 1: Post-treatment estrus parameter and conception rate in true anestrus Mehsana buffaloes under two synchronization protocols (n=16)

Sr. No.	Parameter		Group I (n=8)	Group II (n=8)
1	Estrus induction rate (%)		100.00 (8/8)	100.00 (8/8)
2	Induced estrus (days)		15.50	14.25
3	Duration of estrus (h)		20.25 ± 1.94	21.00 ± 1.96
4	Intensity of estrus (%)	Intense	37.50 (03/08)	25.00 (02/08)
		Moderate	50.00 (04/08)	62.50 (05/08)
		Mild	12.50 (01/08)	12.50 (01/08)
6	Respondents to treatment		100.00 (8/8)	100.00 (8/8)
7	Post-treatment fertile estrus (days)		62.66 (n=6)	52.71 (n=7)
8	Conception rate (%)		75.00 (6/8)	87.50 (7/8)

confirm true anestrus, defined by small, smooth, inactive ovaries with no palpable structures on either ovary and no pathological abnormalities in the genital tract. Postpartum true anestrus Mehsana buffaloes (n=16) selected were divided into two groups. Group I (n=8) buffaloes were administered a GnRH analogue, Buserelin acetate 10 µg (Inj. Receptal®, MSD Animal Health India, Pune; 2.5 mL), intramuscularly, followed 7 days later by Cloprostenol 250 µg (Inj. Zolcol®, Carus Laboratories Private Limited, Karnal; 2 mL), intramuscularly, and two days later a second injection of 2.5 mL of Buserelin acetate. The buffaloes were then subjected to fixed-time artificial insemination (FTAI) at 12 to 24 h after the second injection of Buserelin acetate. In Group II (n=8), buffaloes were administered a similar regimen but received double-dose of Buserelin acetate injections (5 mL each). The percentage of estrus induction, days of induced estrus, and duration of estrus, intensity of estrus expression, days at fertile estrus post-treatment, and conception rates were recorded.

Results and Discussion

The post-treatment estrus parameter and conception rate in postpartum true anestrus Mehsana buffaloes are presented in Table 1. The estrus induction rate was 100% in buffaloes of both Group I and Group II. The results in Group I and II were consistent with the earlier reports on postpartum anestrus or subestrus buffaloes of different breeds with standard ovsynch protocol (Yendraliza *et al*., 2011; Alyas *et al*., 2013; Prasad and Rao, 2014; Kalaswa *et al*., 2017: Savani *et al*., 2017), and with Modified ovsynch protocol (Ghuman *et al*., 2014; Raval *et al*., 2017; Vijyeta *et al*., 2017).

The mean number of days to the onset of induced estrus after treatment was similar (15.0 and 14.25 days) in Groups I and II, with ranges of 0.5-38 and 1.0-32 days, respectively (Table 1), consistent with 12.70±5.13 days reported in postpartum anestrus Surti buffaloes (Nakrani *et al*., 2014) and 16.98 days in postpartum true anestrus Mehsana buffaloes (Kalaswa *et al*., 2017). The mean duration of estrus after treatment was slightly longer in Group II than in Group I (21.00±1.96 and 20.25±1.94 h, respectively). The mean duration of estrus following the modified Ovsynch protocol found as 21±1.96 h in Group II corroborated well with 20.66±1.11 h (Kumar *et al*., 2015) but differ from 26.5±9.6 h reported by Berber *et al*. (2002) in postpartum anestrus buffaloes using similar protocol.

The major symptoms observed were vaginal mucus discharge, edema, and vulvar wetness, followed by excitement, occasional bellowing, and rarely, off-feed. The induced estrus intensity classified as intense, moderate, and mild revealed that the frequency of buffaloes with moderate estrus intensity was highest in both the groups followed by intense and mild (Table 1). Most buffaloes showed moderate to intense signs of estrus. However, the proportion of moderate signs of heat was higher in the modified Ovsynch group, which received a double dose of the GnRH analogue. These findings with Ovsynch protocol also corroborated with the earlier reports in cyclic or true anestrus buffaloes of different breeds (Alyas *et al*., 2013; Kajaysri *et al*., 2015; Kalaswa *et al.*, 2017; Rathore *et al*., 2017).

The percentage of buffaloes conceived during the 150-day follow-up period after treatment was higher in the Modified-ovsynch protocol than in the Ovsynch protocol (87.50 Vs. 75.00 %). Average days at fertile estrus post-treatment were 62.66 (6/8) and 52.71 (7/8) in conceived buffaloes of Group I and Group II, respectively. Conception rate of 75.00 % achieved with the Ovsynch protocol in Group I, agreed well with the findings of Nakrani *et al*. (2014) and Kalaswa *et al*. (2017). The per cent conception rate of 87.50 obtained using the modified ovsynch protocol in the present study was quite high than 66.66 % (Vijyeta *et al*., 2017) and 62.5 % (Raval *et al*., 2017) reported in postpartum anestrus and subestrus Jafarabadi buffaloes and buffalo heifers using the modified double ovsynch protocol.

It is concluded that the use of a double dose of GnRH analogue in the Ovsynch protocol is paramount to the single dose in terms of reducing the post-treatment fertile estrus

interval with higher conception rate in postpartum true anestrus buffaloes.

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