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Pattern of estrus response and conception rate following G6G and Ovsynch treatments in post-partum repeat breeding crossbred cows

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Abstract
This study was designed to evaluate the efficacy of G6G treatment on pattern of estrus response and conception rate over Ovsynch treatment initiated on random days of estrous cycle in post-partum repeat breeding crossbred cows. Sixteen (n=16) cows were equally divided into two groups *viz.*, Group 1, which received Ovsynch treatment and Group 2, which received G6G treatment. The onset of estrus in Group 1 and 2 was 48.21±1.91 and 50.12±1.84 hrs respectively. The duration of estrus in Group 1 and 2 was recorded as 19.12±1.07 and 21.47±1.18 hrs respectively. In the present study, the conception rate was 12.50 and 50.00 percent in Group 1 and 2 following Ovsynch and G6G treatments respectively. It could be concluded that the use of G6G treatment was capable of responding better in terms of estrus response and conception rate in post-partum repeat breeding crossbred cows.

Keywords: Repeat breeding, cow, Ovsynch, G6G, estrus, conception rate

1. Introduction

Repeat breeding is one of the major frustrating reproductive syndromes among dairy farmers due to extended intercalving period, lower conception and higher cost of rearing. Repeat breeding syndrome is defined as a condition in which cattle and buffaloes which has regular estrous cycles but has failed to become pregnant following three or more breedings [1, 2]. The incidence of repeat breeding varies from 5.5-33.33 percent in lactating dairy cows [3]. Repeat breeding has been attributed to genetic predisposition, nutrition, hormonal involvement, gametic abnormalities, delayed ovulation, inadequate luteal function, infection and managerial factors. The causes of repeat breeding may originate either during the early stages of follicle maturation and/or during the pre-ovulatory period. Ovsynch protocol has been proposed as a remedy for repeat breeding in dairy cows with limited success. It has been revealed that the success of Ovsynch treatment is highest when treated cows ovulate to the first GnRH injection. Therefore, initiation of Ovsynch on day 5 to 9 of estrous cycle has a greater probability of synchronizing and higher conception rate [4]. Therefore, the scientific idea of G6G is to initiate Ovsynch treatment on day 6 of estrous cycle [5]. In this context, this study was designed to evaluate the efficacy of G6G treatment over classical Ovsynch treatment in post-partum repeat breeding crossbred cows.

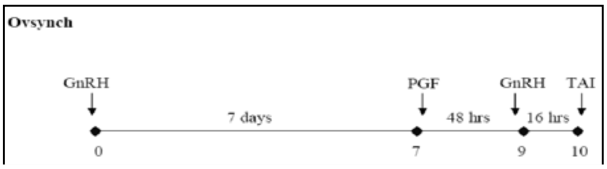
2. Materials and Methods

2.1 Animal selection

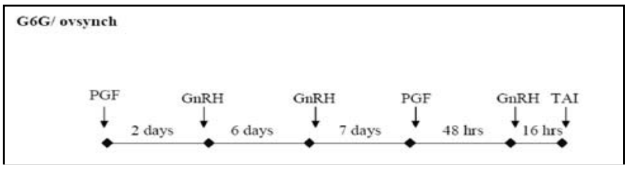
A total of sixteen (n=16) apparently healthy post-partum repeat breeding crossbred cows were included for this study. These cows were screened gynaeco-clinically twice at 10 days interval and cows having a corpus luteum were considered as cyclical and included for the study. The cows were reared under standard feeding condition. All the cows were dewormed and vaccinated against foot and mouth disease, black quarter and haemorrhagic septicaemia well ahead the study. Cows were supplemented with mineral mixture daily during the period of study.

2.2 Treatments

All the repeat breeder cows (n=16) were randomly and equally divided into two groups *viz.*, Group 1, received Ovsynch treatment on random days of estrous cycle as described by Pursley *et al.* [6]; which consisted of i/m injection of 10 µg or 2.5 ml of GnRH analogue on day 0, 500 µg or 2 ml of $PGF_{2\alpha}$ analogue seven days later (day 7), another 10 µg or 2.5 ml of GnRH analogue 48 hrs after $PGF_{2\alpha}$ injection (day 9) and timed AI (TAI) at 16-18 hrs after second GnRH injection (day 10).



Group 2, received G6G treatment as described by Bello *et al.* [5]; which consisted of a i/m injection of 500 µg or 2 ml of $PGF_{2\alpha}$ analogue on day 0, 10 µg or 2.5 ml of GnRH analogue two day later (day 2) and Ovsynch treatment six days later (day 8 onward).



2.3 Estrus response
Estrus response in percentage was calculated as number of cows expressed sings of estrus. Onset of estrus was calculated in hours (hrs) from $PGF_{2\alpha}$ injection of Ovsynch to the time of first appearance of estrus signs. Duration of estrus was also calculated in hours from first appearance of estrus sings to the time of disappearance of estrus signs. The intensity of estrus was determined by score-card described by Rao and Rao [7] with some modifications.

2.4 Conception rate
Pregnancy was determined per rectally on day 60 post TAI. Conception rate was calculated by the following equation

$$\text{Conception rate} = \frac{\text{Number of cows conceived}}{\text{Number of cows treated}} \times 100$$

2.5 Statistical analysis
The data was analyzed statistically by using SPSS software.

3. Results and discussion
In the current study, all the repeat breeding crossbred cows were responded to G6G treatment with different estrus intensities, which was in agreement with the findings of early researchers [8, 9]. The lower estrus respond in Group 1 (Table 1) following Ovsynch treatment might be due to application of Ovsynch treatment too early (day 1–4) or too late (day 13–20) of estrous cycle [4].
During the study, onset and duration of estrus were not significant between the groups following different treatment regimens. The onset and duration of estrus in treated repeat breeding crossbred cows was in close proximity with the findings of others in repeat breeder crossbred cows [10, 11].

Table 1: Pattern of estrus respond and conception rate following Ovsynch and G6G treatments.

Group	Estrus respond (%)	Onset of estrus (hrs)	Estrus duration (hrs)	Estrus intensity (%)			Conception rate (%)
				Intense	Intermediate	Weak	
Group 1	75	48.21±1.91	19.12±1.07	12.50	37.50	50.00	12.50^a
Group 2	100	50.12±1.84	21.47±1.18	25.00	50.00	25.00	50.00^b

Significant at p<0.05, values bearing different superscripts differ significantly

The aim of the study was to achieve higher conception rate following G6G protocol over classical Ovsynch protocol. The conception rate for Group 1 and Group 2 was recorded as 12.50 and 50.00 percent following Ovsynch and G6G treatments respectively (Table 1). The present study was in collaboration with the findings of Dirandeh [12]. The lower conception rate in Group 1 (Ovsynch) could be due to initiation of Ovsynch treatment on random stage of estrous cycle. Initiation of the Ovsynch protocol too early (1–4 days after ovulation) or too late (13–20 days after ovulation) reduced synchrony as well as resulting conception failure [4].
In the present study, the higher conception rate following G6G treatment in post-partum repeat breeding crossbred cows was due to G6G designed to initiate Ovsynch treatment on day 6 of estrous cycle. It has been opined that the success of Ovsynch protocol is dependent on the day of the estrous cycle that the program is initiated [4, 13]. When Ovsynch is initiated during the early luteal phase of the estrous cycle (day 5–9), results in higher synchronization of ovulation and conception rate [4, 14]. A new follicular wave could be emerged and ovulation of dominant follicle of first follicular wave following first GnRH injection of Ovsynch i.e. second GnRH of G6G treatment. The presence of dominant follicle of new follicular wave at second GnRH of Ovsynch treatment (i.e. third GnRH of G6G treatment) before TAI resulted in higher probability of ovulation and better conception rate [5, 15].

4. Conclusion
From the study, it could be concluded that the use of G6G treatment was capable of responding better in terms of estrus response and conception rate than Ovsynch treatment initiated on random days of estrous cycle in post-partum repeat breeding crossbred cows. However, onset and duration of estrus was not significant.

5. Acknowledgement
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