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Conception rate after synchronization of estrus in repeat breeding cross bred cows

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Abstract

The present experiment was conducted to evaluate the efficacy of synchronization protocol using CIDR and PGF₂ α on the conception rate of repeat breeding cross bred cows. A total of 10 normal cyclical cross bred cows and 10 repeat breeding cross bred cows with suprabasal preovulatory progesterone concentration and negative for subclinical endometritis were selected for the study. The experimental cows were subjected to estrus synchronization protocol using CIDR and PGF₂ α . CIDR was inserted intravaginally for 8 days and PGF₂ α was administered on day 7 after CIDR insertion and CIDR was removed on day 8. The cows were inseminated 48 hours and 72 hours after CIDR removal. The pregnancy was diagnosed on day 45 post insemination. The conception rate was 60 per cent (6/10) in normal cyclical cows and 30 per cent (3/10) in repeat breeding crossbred cows in the present study. The present study concluded that synchronization of estrus using CIDR and PGF₂ α improved the conception rate in repeat breeding cows but the not on par with normal cyclical repeat breeding cows.

Keywords: Surgical management, anesthetic protocol, vaginal hyperplasia, canine, protruded muscular

Introduction

Infertility in the present scenario had its incidence of 15 to 20 per cent and repeat breeding formed the majority of it followed by anestrus (Selvaraju *et al.*, 2020) [12]. The incidence of repeat breeding in cows and buffaloes could be evident in small holders and marginal farmers and this might be due to the lack of appropriate managerial practices and proper technical knowledge in identifying the condition. Even though various factors are responsible for repeat breeding, the major factors that contributed greatly are improper detection of estrus (Selvaraju *et al.*, 2009) [9], altered hormonal milieu during early luteal phase, suprabasal concentration of progesterone during periovulatory period and ovulation asynchronies (Preeti *et al.*, 2023) [3]. The etiologies for repeat breeding syndrome are ample and hence no single treatment likely to work to alleviate the condition (Selvaraju *et al.*, 2009). To counteract the hormonal alterations and ovulatory problems the use of hormonal preparations like progestogens, hCG, prostaglandins, GnRH and their combinations could be entrusted (Selvaraju *et al.*, 2023, and Preeti *et al.*, 2023) [6, 3]. Hence the study was conducted to evaluate the use of CIDR and PGF₂ α in the treatment of repeat breeding cows with suprabasal progesterone concentration.

Materials and Methods

The experimental cows were selected based on the absence of reproductive pathologies and negative for subclinical endometritis. Serum samples were collected from the selected cows and analysed for the progesterone concentration on day 0 (preovulatory) in all the experimental cows. The normally calved cyclical cows in 60-90 days postpartum with basal progesterone concentration (< 1.0 ng/ml) were selected as fertile cows and the cyclical cows having suprabasal progesterone values (> 1.0 ng/ml) were selected as repeat breeders.

The oestrus was synchronized in all the experimental cows using CIDR and PGF₂ α protocol. All the cows in the group I and group II were inserted with CIDR intravaginally on day 7 of estrous cycle for 8 days. PGF₂ α was administered on day 7 after CIDR insertion and CIDR was removed on day 8.

The cows were observed for the estrus signs from 36 hours after CIDR removal and inseminated artificially at 72 hours and 96 hours after PGF₂α administration (i.e. 48 and 72 hours after CIDR removal). Pregnancy diagnosis was done at 45th day post insemination ultrasonographically with a real time ultrasound scanner (Sonoray DS50 VET[®]) equipped with liner array, 5-10 MHz frequency transrectal transducer. The gain, brightness and contrast were set optimally for each examination.

Results and Discussion

The preovulatory serum progesterone concentrations before synchronization in normal cyclical and repeat breeding cows were 0.49±0.10 and 1.19±0.12 ng/ml, respectively. The estrus response was 100 per cent in both normal cyclical and repeat breeding cows. The estrus was intense in 50 per cent of experimental cows, 40 per cent was intermediate in repeat breeding cows and 30 per cent in normal cyclical cows and weak in 10 per cent repeat breeding cows and 20 per cent normal cyclical cows.

The estrus response rate in the present study is in accordance with Selvaraju *et al.* (2008) [8] using hCG and PGF₂α, Selvaraju *et al.* (2009) [9] using synchromate-B ear implants, Ahmed *et al.* (2016) [11] using Ovsynch protocol and Rajkumar *et al.* (2018) [4] using CIDR and PGF₂α protocol in repeat breeding cows. The onset of estrus in normal cyclical and repeat breeding cows was 48.10±1.99 and 51.20±1.31 hours, respectively. However, higher interval to onset of estrus was reported by Selvaraju *et al.* (2008) [8] in repeat breeding cows using PGF₂α during midcycle (59.38±0.81 hours) and in contrast, Selvaraju *et al.* (2009) [9] recorded an interval of 29.25±0.70 hours after synchromate-B implant in repeat breeding cows. Similar to the present study, Ahmed *et al.* (2016) [11] reported 48.75±0.71 hours using Ovsynch protocol and 51.47±1.98 hours using Ovsynch protocol with GnRH treatment. The duration of estrus in normal cyclical and repeat

breeding cows were 26.80±1.02 and 41.00±2.58 hours. In contrast, lower duration of estrus reported by Selvaraju *et al.* (2009) [9] and Selvaraju *et al.* (2008) [8] and Ahmed *et al.* (2016) [11] in repeat breeding cows. The variation in the duration of estrus from the other studies might be due to the suprabasal progesterone concentration which delayed the LH surge in repeat breeding cows. The pregnancy rates in normal cyclical and repeat breeding cows were 60 per cent (6/10) and 30 per cent (3/10).

In contrast, higher pregnancy rate in repeat breeding cows were reported by Selvaraju *et al.* (2009) [9] after synchronization with synchromate-B (43.75 per cent) and Ahmed *et al.* (2016) [11] using GnRH protocols (50.00 per cent) in repeat breeding cows. The induction of oestrus and fixed time insemination could have helped in reducing the oestrus detection errors which created favourable hormonal and uterine milieu for establishing pregnancy (Selvaraju *et al.*, 2009) [9]. The elevated serum progesterone post insemination after Synchromate-B plus PGF₂α therapy could have positively influenced the conception in repeat breeder cows (Selvaraju *et al.*, 2011). Selvaraju *et al.* (2012) [7, 11] stated that administration of exogenous hormones to induce oestrus might change the endocrine status of repeat breeding cows and hence hormonal estimation before, during and after oestrus induction protocols might be helpful in predicting the therapeutic response in repeat breeding cows. However, the fine regulation of plasma progesterone concentration during preconception period (Reshma *et al.*, 2018) [5] primed the reproductive system for better development of follicles and better developed corpus luteum. (Honparkhe *et al.*, 2011) [2] thus establishing pregnancy. The reduced pregnancy in the present study might be due to higher concentration of progesterone at oestrus recorded in non-pregnant cows might have been one of the contributing factors for the failure of conception in this study (Selvaraju *et al.*, 2011) [7].

Pattern of estrus and conception rate following estrus synchronization in normal cyclical cows and repeat breeding cows with suprabasal progesterone concentration

Sl. No.	Groups	Estrus response (Per cent)	Estrus Intensity			Onset of estrus	Duration of estrus	Conception rate
			Intense	Intermediate	Weak			
1	Group I	100	50 (5/10)	30 (3/10)	20 (2/10)	48.10±1.99	26.80 ^a ±1.02	60 (6/10)
2	Group II	100	50 (5/10)	40 (4/10)	10 (1/10)	51.20±1.31	41.00 ^b ±2.58	30 (3/10)

Conclusion

The study highlights the significant prevalence of repeat breeding in cows, attributed to various factors including inadequate estrus detection and hormonal imbalances. The use of CIDR and PGF₂α protocols effectively synchronized estrus in both normal cyclical and repeat breeding cows, resulting in a 100% estrus response. However, pregnancy rates were notably lower in repeat breeders compared to normal cyclical cows, indicating the complexity of managing this condition. The findings suggest that hormonal treatments can improve reproductive outcomes, but careful monitoring of progesterone levels is essential to optimize fertility. Future research should focus on refining these protocols and understanding the underlying hormonal dynamics to enhance conception rates in repeat breeding cows.

Conflict of Interest

Not available

Financial Support

Not available

Reference

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