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ORIGINAL RESEARCH

Effect of prostaglandin on estrus response and conception rate in lactating ongole cows

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Abstract

Aim: The present research work was carried to study the estrus response and conception rate in lactating Ongole cows consequence to double injection of prostaglandin.

Material and Methods: Estrus synchronization was performed by double injection of PGF2α (Lutalyse, 5ml/cow) in purposively selected 22 lactating Ongole cows. The 1st injection was administered on 60 days post partum (day 0) followed by 2nd injection on 72 days postpartum (day 12) and then insemination was carried out at observed estrus.

Results: The ovarian response by ultrasound scanning revealed a dominant follicle of 10.00 ± 0.78 mm 3-4 days after the PGF2α administration. Out of 22 cows treated with double injections of prostaglandins 18 cows exhibited estrus within 68.66 ± 10.24 hrs. The duration of estrus and mean estrous cycle length recorded as 14.20±2.56 hrs and 21.50+0.21 days, respectively. The estrous cycle was observed in 79.45 % cows. The remaining cows showed 11-17 (5.48%), 26-36 (9.59%) and 37- 60 (5.48 %) days of estrous cycle length. The conception rate of observed to be 67.00 ±0.26 %. The mean calving to service period found to be 81.18± 1.62 days in lactating multiparous Ongole cows.

Conclusion: It may be concluded that double injection of Prostaglandin has reduced the calving to service period which would even truly reduce calving interval in lactating Ongole cows.

Key words: conception rate, estrus response, Ongole cows, prostaglandin

Introduction

India is the treasure house of *Bos indicus* breeds [1-2]. The State of Andhra Pradesh situated on the eastern coast of peninsular India is known for the world famous Ongole breed of cattle (Nelore in Brazil). Ongole is a triple purpose (milk, draught and beef) cattle breed. By virtue of their adaptability traits, superior production capacity under harsh tropical conditions, they are very much sought after animals in tropical cattle production. However, certain reproductive impediments like long calving to service period, long calving interval and short estrus duration, incidence and cessation of estrus at night and postpartum anestrous are limiting the economic use of this cattle breed [3-4]. Knowledge of follicular dynamics and estrous behaviour is essential for estimating the best time for artificial insemination and to obtain best conception rate. This situation warrants application of corrective measures to obviate prolonged inter calving period in postpartum lactating Ongole cows. The use of double injection of PGF2 α at 12 days apart was found to be effective in getting conception rates and comparable with natural estrus [5]. The objective of present research work was to study the estrus response and conception rate in lactating Ongole cows consequence to double injection of prostaglandin.

Materials and Methods

Ethical approval: Use of animals in this study was approved by the Institutional Animal Ethical Committee as per CPCSEA (Committee for the Purpose of Control and Supervision on Experiments on Animals) Government of India norms.

Twenty two postpartum multiperous lactating Ongole (Bos indicus) cows aged 4-10 years in their 2nd to 5th lactation with the body weight of 350-450 kgs maintained under standard feeding and management at Cattle Project, Live Stock Research Station, Lam Farm, Guntur, ($15^0$00 and $16^0$10 North latitude and $79^0$04 and $80^0$02 East Longitude), Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh, India, were included in this study. Estrus synchronization was performed by double injection of PGF2α (Lutalyse, 5ml/cow, Pfizer Manufacturing Belgium NV, Rijksweg 12, 2870 Puurs-Belgium). The 1st injection was administered on 60 days post partum (day 0) followed by 2nd injection on 72 days postpartum (day 12) and then insemination was carried out at

Table-1. Effect of double Prostaglandin (PG) on estrus pattern and conception rate

Sr.No	Parameters	Mean ± SE
1	Estrus response (%)	82 (18/22)
2	Intensity of estrus (%)	
	a). Weak	9.10 (2/22)
	b). Normal	90.90 (20/22)
	c). Intense	0.00 (0/0)
3	Estrus duration (hrs)	14.20±2.56
4	Ovulatory response (%)	100 (22/22)
5	Ovulation time (after the 2nd $PGF_2\alpha$ inj.)	4.70±0.22
6	Conception rate at induced estrus (%)	67.00±0.26
7	Service period (days)	81.18± 1.62

observed estrus. All the experimental cows were monitored regularly for estrous symptoms and ovarian cyclicity by regular per rectal gynecological examinations. The ovarian structures in 6 cows designed in investigation were studied daily by a real time B-mode ultrasound scanner using a transrectal 7.5-MHz transducer (Medison 600, Universal Medical Systems, Medison Co., Ltd, Medison Venture Tower 997-10 Daechi-dong, Kangam – Ku Seoul 135-280, KOREA). The data was analyzed by Minitab[16] (2012) software.

Results and Discussion

The PGF2α induced luteolysis appears to be faster in zebu cows [6] which causes the estrum, the ovulatory LH surge and ovulation. The observations recorded by ultrasound scanning revealed a dominant follicle of 10.00 ± 0.78 mm 3-4 days after the PGF2α administration (Table-1). The dominant follicle size recorded in this study was in agreement with [7-10]. The ovulation rates recorded in the present study were 100 %. The ovulation rate observed was in agreement with the results of [11] in Nelore cows.

Out of 22 cows treated with double injections of prostaglandins 18 exhibited estrus within 68.66 ± 10.24 hrs. The time of onset of estrus following PGF2α injection recorded in this study is corroborating to earlier findings of [6] in Indu Brazil cows and [12-13] in Nelore cows who observed the same of 63.50 and 53.40 hrs, respectively.

In the present study, the estrus response recorded lower (82 vs 92) than earlier reports of [3] in Nelore cows. Higher estrus response was reported by in *Bos indicus* cows [5]. The poor response in the investigation might be due to that this treatment synchronizes follicular growth only by regulating the life span of the *corpus luteum*.

In the present study, the duration of estrus recorded as 14.20±2.56 hrs might be due to individual hormonal levels and genetic makeup. The intensity of estrus found to be 90.90 % (20/22) exhibited normal while 9.10 % (2/22) was weak. This study was in concurrence with the observations of [7,14].

The conception rate was found to be 67.00 ±0.26 % in PGF2 α treated cows [5] has reported higher conception rate (90.0%) than the present findings in Ongole cows, this might be due to better synchrony of ovulation and fertilization as the existing follicles were influenced the next wave of follicles during induction. The lower percentage of conception rate could be attributed to the ovarian status of cows at which treatment was induced and the type of PGF2α preparation used [15]. The higher conception rate at induced estrus in cyclic cows might be due to synchrony of ovulation and fertilization as the existing follicular wave influences the emergence of the next wave of follicles formation during induction [4,14-16].

In the present study, the mean calving to service period was 81.18± 1.62 days which is comparable with results of [5] in beef cattle following synchronization with cloprostenol.

Conclusion

The study concluded that double injection of Prostaglandin has reduced the calving to service period which would eventually reduce calving interval in lactating Ongole cows.

Authors' contribution

KVR carried out the experiment under supervision of KSR. KS analyzed the data and NR prepared the manuscript. All authors have read and approved the final manuscript.

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Competing interests

Authors declare that they have no competing interest.

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