

Studies on Efficacy of 7D CIDR-GnRH Protocols for Induction of Ovulatory Estrus in Anestrus Buffaloes

K. V. Narote^{1*}, N. M. Markandeya², A. G. Sawale³, B. L. Kumawat⁴ and Mahendra Kumar⁵

¹M.V.Sc. Student of Animal Reproduction Gynaecology and Obstetrics, College of Veterinary and Animal Sciences COVAS, Parbhani, MAFSU, Maharashtra, INDIA

²Head of Department of Animal Reproduction Gynaecology and Obstetrics and Associate Dean, of College of Veterinary and Animal Sciences, Parbhani, MAFSU, Maharashtra, INDIA

³Assistant Professor, Animal Reproduction Gynaecology and Obstetrics, College of Veterinary and Animal Sciences, Parbhani, MAFSU, Maharashtra, INDIA

⁴Subject Matter Specialist, of Animal Reproduction Gynaecology and Obstetrics, College of Veterinary and Animal Sciences, Parbhani, MAFSU, Maharashtra, INDIA

⁵M.V.Sc. Student of Animal Genetics and Breeding, College of Veterinary and Animal Sciences, Parbhani, MAFSU, Maharashtra, INDIA

*Corresponding Author: mk.narote05@gmail.com

How to cite this paper: Narote, K. V., Markandeya, N. M., Sawale, A. G., Kumawat, B. L., & Kumar, M. (2021). Studies on Efficacy of 7D CIDR-GNRH Protocols for Induction of Ovulatory Estrus in Anestrus Buffaloes. *International Journal of Livestock Research*, 11(1), 162-166. <http://dx.doi.org/10.5455/ijlr.20191014103951>

Received : Oct 14, 2019
Accepted : Dec 27, 2020
Published : Jan 31, 2021

Copyright © Vikram *et al.*, 2021

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). <http://creativecommons.org/licenses/by/4.0/>



Abstract

The present study was conducted to evaluate the effect GnRH - CIDR- PG protocols for treatment of anoestrus in buffaloes. Buffaloes having body condition score 2.5 to 3.5 scale, with post-partum period of 6 to 9 month and mature heifers with minimal 300 kg body weight were selected for trail. Group I (n=12) buffaloes received CIDR implant for 7D followed by Inj. PGF2 α @ 500 μ g IM just before CIDR removal. Group II (n=12) buffaloes received same treatment after Inj. GnRH @ 10 μ g IM at CIDR insertion. Oestrus induction rate (%), treatment response interval (hrs), overall conception rate (%) and pregnancy rate (%) were found to be 83.33, 64.4 4.44, 77.77, 58.33 in Group I and 75.00, 53.3 3.33, 70.00 and 58.33 in Group II, respectively. Thus, 7D GnRH-CIDR-PG protocol was found to be superior for induction of oestrus in anoestrus buffaloes.

Keywords: Buffaloes, CIDR, Oestrus Induction, PGF2 α and GnRH

Introduction

Buffaloes are backbone of Indian dairy business contributing more than 50 per cent of milk to the national milk pool, which is greater than contribute of cattle (19th Livestock census- 2012). In buffaloes, the reproductive efficiency is prime factor to deprive the production hindered by delayed pubertal estrous, poor expression of estrous in summer, seasonality of reproduction and extended inter-calving intervals (Singh *et al.*, 2000).

Anoestrus is the stage of ovarian inactivity, leading to cessation of sexual activity without expression of heat signs (Wright and Malmo, 1992). The incidence of anoestrus in buffaloes has been reported varying between 9.09-60.83 per cent in India (Kumar *et al.*, 2014). Bharkhad and Markandeya (2003) reported higher incidence of anoestrus in adult buffaloes than the heifers. Anoestrus problem can be resolved by using progesterone (P4) and other alternatives or even combinations treatment like P4 and estradiol, P4 and FSH, P4 and GnRH etc. Moreover, the GnRH injected at time of CIDR insertion required less time for ovulation due to high frequency of LH pulses as compared to CIDR alone (Ando *et al.*, 2004).

CIDR facilitates constant release of P4 in to the systemic circulation in the body, which mimics the luteal phase of the cycle by acting as an artificial CL (Rathbone, 2002). P4 exerts negative feedback on hypothalamus and anterior pituitary and thus prevents release of gonadotropins without interfering their synthesis. When the implant is removed, the serum P4 concentration is suddenly falls and its negative feedback effect is also withdrawn that leads to bulk release of gonadotrophins. This results in initiation of growth, development and maturation of follicles culminating into induction of estrous. Considering the prevalence of anoestrus in buffaloes of Marathwada region, Efficacy of CIDR-PG protocol was studied in the present clinical trial.

Material and Methods

The research work was carried out at College of Veterinary and Animal Sciences, Parbhani, in Department of Animal Reproduction Gynaecology and Obstetrics. Total 24 healthy non-cyclic Marathwadi and Jaffarabadi buffaloes with the history of six to nine months of anoestrus period and mature breedable heifers with body weight 275 kg were selected for studies. The reproductive check up to confirm inactive status of ovaries was attempted thrice and at 10 days interval buffaloes diagnosed as anoestrus and those having unresponsive ovarian status were included for the hormonal trials to induced estrus. The selected buffaloes were divided in to two groups each consisting of 12 animals. The controlled Internal Drug Releasing device (CIDR) is a T- shaped device with pliable wings impregnated with 1.38 gm of progesterone in elastic silicone moulded over a nylon core. EAZI-BREEDTM CIDR® is marketed by Zoetis India Limited. Group I buffaloes received CIDR implant intravaginally on day 0 and removed on day 7 followed by Inj PGF2 α (pragma) 500 μ g IM just before removal of CIDR. The treated animals were kept under observation for next 5 days to detect induced estrus and the responded animals were bred by AI upon detected estrus. Group II twelve buffaloes were received same CIDR-PG treatment except Inj GnRH (Gynarich) 10 μ g IM at CIDR insertion. The treated animals were kept under observation for next 5 days for detection of oestrus.

Statistical Analysis

The data of research work was tabulated by using ANOVA two factor without replication as given by Snedecor and Cochran (1994) and interpretations were drawn.

Result and Discussion

The induction of oestrus rate, treatment response interval and number of services per conception in buffaloes treated with 7D CIDR-PG protocol treatment has been shown in Table 1. In Group I (7D CIDR-PG), the estrus induction response was recorded as 75.00 per cent. Lower oestrus induction rate was reported by Zaabel *et al.* (2009) as 42.90 per cent and Ghallab and Noseir (2016) as 64.28 per cent. The higher estrus induction rates were reported by Naseer *et al.* (2013) as 80.00 per cent and Nakrani *et al.* (2014) as 100.00 per cent in anoestrus buffaloes.

In Group II (GnRH-7D CIDR-PG) the oestrus induction rate was recorded as 83.33 per cent. The Nasser *et al.* (2012) studied similar protocol in Nilli-Ravi buffaloes and reported comparable oestrus induction rate as 80.00 percent. Vikash *et al.* (2014) used similar therapy in anoestrus buffaloes under field conditions in Haryana and

recorded higher oestrus induction rate 96.87 per cent. Parmar *et al.* (2017) reported higher treatment response as 83.33 per cent. The treatment response interval recorded in (hrs) as 64.4 ± 4.44 hrs in Group I. These findings for Group I are in agreement with Nakrani *et al.* (2014) who reported it as 65.00 hrs. In Group II, the treatment response interval was recorded as 53.3 ± 3.33 hrs. The Nasser *et al.* (2012) studied similar protocol in Nilli-Ravi buffaloes and reported the same as 80.0 hrs after implant removal. Lower treatment response interval found in Group II may be due to GnRH administration simultaneously with CIDR insertion and appears to be more inclined to the role of LH. Increase in the level of LH because of GnRH administration is expected to act in two ways. Anoestrus ovary carrying incompletely developed follicles are expected to mature and ovulate with increase in LH or ovary is carrying incompletely developed corpora lutea are expected to be fully luteinized, which will undergo luteolysis by scheduled PG administration of the protocol. These vents are expediting new emergence of follicular growth for induction of oestrus.

Table 1: Comparative percentage of fertility parameters in anoestrus buffaloes treated with different CIDR-PG protocols

Particulars	Group I	Group II
Estrus induction rate (%)	75.00%	83.33%
Treatment response interval (hrs)	66.4 ± 4.44	53.3 ± 3.33
No. of services per conception	2.42	2.85
First service conception rate (%)	44.44%	40.00%
Overall conception rate (%)	77.77%	70.00%
Pregnancy rate (%)	58.33%	58.33%

In the present experimentation treatment response interval was found to be 53.3 ± 3.33 hrs, in group II which was much less than Groups I. Similar observation regarding the GnRH injection concurrent with CIDR insertion, which required less time for ovulation due to high frequency of LH pulse as compare to CIDR alone, has been recorded by Ando *et al.* (2004).

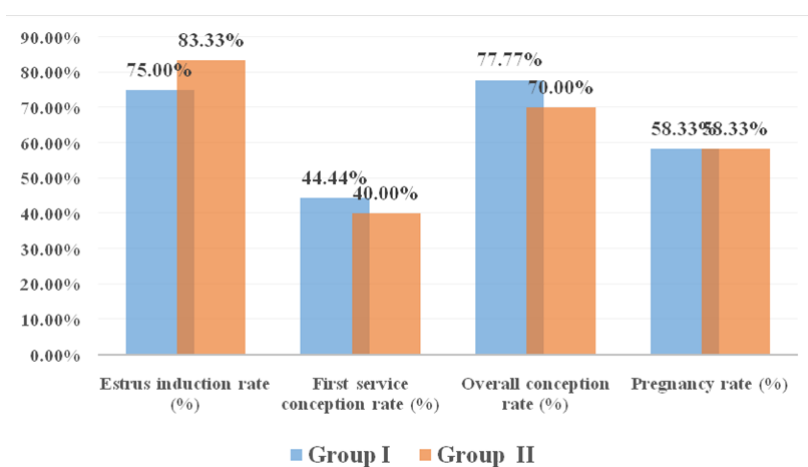


Figure 1: Showing comparative percentage of fertility response in anoestrus buffaloes treated with different CIDR protocols

In Group I, out of 12 buffaloes 44.44% conceived at first service and overall conception rate at induced oestrus was 77.77 per cent. On contrary the Parmar *et al.* (2017) attempted similar CIDR therapy and recorded lower overall conception rate as 66.66 per cent in anoestrus buffaloes. The Nakrani *et al.* (2014) used CIDR protocol in anoestrus buffaloes and reported first service conception rate as 46.67 per cent and overall conception rate as 66.67 per cent. Resume *et al.* (2017) used CIDR-PG treatment with PG injection on day 6th in anoestrus buffaloes and reported higher first service conception rate as 66.66 per cent and 83.33 per cent overall conception rate. On contrary the Cevik *et al.* (2010) used similar therapy in dairy cow, for synchronization of estrus and observed comparable pregnancy rate (53.30 vs 58.33) with present finding. The Naseer *et al.* (2013) reported higher pregnancy rate as 80.00 per cent.

In Group II, out of 12 buffaloes 40.00% conceived at first service and overall conception rate at induced oestrus was 88.88 per cent. The findings is higher than Vikash *et al.* (2014), who noted it as (74.19%) but higher pregnancy rate (81.33%) as compared to present findings.

On comparison of 7D CIDR-PG protocol with that of GnRH-7D CIDR-PG protocol reproductive parameters were found to be higher in terms of oestrus induction rate and establishment of cyclicity but first service conception rate and overall conception rate were higher in 7D CIDR-PG protocol. The final result of pregnancy rate was at par in both the groups.

Conclusion

The post-partum anoestrus buffaloes and delayed pubertal heifer treated GnRH combination at CIDR insertion exhibit higher oestrus induction response, and better pregnancy rate as compared to CIDR alone. The oestrus synchronisation with GnRH-7D CIDR-PG protocol was beneficial for acquiring better reproductive results.

Acknowledgement

I am very thankful to Associate Dean of College of Veterinary and Animal Sciences, Parbhani for providing all facilities which is necessary to complete my research work.

Conflict of Interests

There is no conflict of interest.

Publisher Disclaimer

IJLR remains neutral concerning jurisdictional claims in published institutional affiliation.

References

1. Ando, T., S. Kamimura, K. Hamana, G. Watanabe and Taya, K. (2005). GnRH Treatment at CIDR Insertion Influences Ovarian Follicular Dynamics in Japanese Black Cows. *Journal of Veterinary Medical Science*, 67(3), 275–280.
2. Bharkad, G. P. and Markandeya, N. M. (2003). Incidence of bovine anoestrus. *Indian Veterinary Journal*, 80, 190 – 191.
3. Cevik M., M. Selcuka and Dogan, S. (2010). Comparison of Pregnancy Rates after Timed Artificial Insemination in Ovsynch, Heatsynch and CIDR-Based Synchronization Protocol in Dairy Cows. *Kafkas Univ Vet Fak Derg*, 16(1), 85-89.
4. Ghallab, R. S. and Noseir, W. M. B. (2016). Comparative Efficiency of Different CIDR Protocols for Treatment of Postpartum Anoestrus in Egyptian Buffaloes. *Alexandria Journal of Veterinary Sciences*, 49(2), 149-156.
5. Kumar, P.R., S. K. Singh, S. D. Kharche, C. S. Govindaraju, B. K. Behera, S.N. Shukla, H. Kumar and Agarwal, S. K. (2014). Anoestrus in cattle and buffalo. *Indian perspective Advances Animal Veterinary Sciences*, 2(3), 124-138.
6. Nakrani, B. B., M. T. Panchal, A. J. Dhami, K. K. Hadiya, J. A. Patel, R. K. Gosai and Shah R. G. (2014). Influence of Controlled Breeding Techniques on Estrus Induction Response, Conception Rate and Plasma Progesterone Profile in Anoestrus Buffaloes. *Global Journal of Medical Research*, 14(3), 1-6.
7. Naseer, Z., N. Ahmad, M. I. R. Khan, E. Ahmad, M. Z. Tahir and Singh, J. (2012). Effect of GNRH and estradiol benzoate on follicular wave emergence, estrus, ovulation and pregnancy rate in CIDR treated nili-ravi buffaloes. *The Journal of Animal and Plant Sciences*, 22(3), 142-146.
8. Naseer, Z., E. Ahmad, N. Ullah, M. Yaqoob and Akbar, Z. (2013). Treatment of anestrus Nili-Ravi buffaloes using eCG and CIDR protocols. *Asian Pacific Journal of Reproduction*, 2(3), 215-217.
9. Parmar, B. N., D. M. Patel, H. P. Vijyeta and Parikh, S. S. (2017). Controlled Breeding Techniques for Enhancing Reproductive Performance of Buffaloes. *Indian Veterinary Journal*, 94(05), 33-35.
10. Rathbone, M. J., C. R. Bunt, C. R. Ogle, S. Burggraaf, K. L. Macmillan C. R. Burke and Pickering, K. L. (2002). Reengineering of a commercially available bovine intra vaginal insert (CIDR insert) containing

- progesterone. *Journal of Controlled Release*, 85(1-3), 105–115.
11. Resum, N. S., U. Sharma, S. Kumar and Kour, P. (2017). Oestrus induction and fertility response in post-partum anestrus buffaloes using CIDR alone or in combination with antioxidants. *Theriogenology Insight*, 7(3), 173-179.
 12. Singh, J., A. S. Nanda, & Adams, G. P. (2000). The reproductive pattern and efficiency of female buffaloes. *Animal Reproduction Science*, 60-61, 593–604.
 13. Snedecor, G. W. and Cochran W. G. (1994). *Statistical methods* (eighth edition). Calcutta, India: Oxford & IBH Publishing Co.
 14. Vikash, M. Virmani, R. K., Malik P. and Singh (2014). Impact of CIDR in combination with different hormones for treatment of anestrus in buffaloes under field conditions in Haryana. *Haryana Veterinarians*, 53(1), 28-33.
 15. Wright, P. J. and Malmo, J. (1992). Pharmacologic manipulation of fertility. *Veterinary Clinic North America Food Animal Practice*, 8(1), 57–89.
 16. Zaabel S. M., A. O. Hegab, A. E. Montasser and El-Sheikh, H. (2009). Reproductive performance of anestrus buffaloes treated with CIDR. *Anim. Reproduction*, 6(3), 460-464.
