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Comparative efficacy of different hormonal protocols in postpartum anoestrus buffaloes

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Abstract

The present investigation was aimed to compare the oestrus induction efficiency, oestrus induction interval and conception rate in postpartum anoestrus and oestrus induced buffaloes. A total of 24 postpartum anoestrus buffaloes were selected from different villages situated around Jaipur (Raj.) and Livestock Farm Complex, Apollo College of Veterinary Medicine, Jaipur (Raj.). These 24 postpartum anoestrus buffaloes were randomly divided into three treatment groups (n=06 each) on the basis of hormonal treatment protocols given to animals of groups. Ovsynch group, Heatsynch group, CIDR plus Heatsynch group while control group (n=06) were left untreated. Therapeutic efficacy of different hormonal protocols in terms of oestrus induction efficiency was found to be 66.66, 66.66 and 83.33% with a mean post treatment oestrus induction intervals of 21.25±0.63, 19.25±0.48 and 20.60±0.50 hrs, while conception rate was recorded as 50.00, 50.00 and 80.00%, respectively in Ovsynch, Heatsynch and CIDR plus Heatsynch groups.

Keywords: Ovsynch, Heatsynch, CIDR, buffaloes, estrus induction, conception rate, postpartum anoestrus

Introduction

The major constraint to full exploitation of the productive potential of buffalo is its inherent low reproductive efficiency due to delayed puberty and sexual maturity, seasonality of breeding, prolonged postpartum anoestrus, silent oestrus, and postpartum uterine disorders (Das and Khan 2010) [7]. Postpartum anoestrus is affected by several factors such as nutrition, milk yield, body condition score (BCS) at calving, suckling, parity, calving season and other factors as documented by Shah *et al.*, (2010) [22]. In order to maintain the recommended calving interval, the buffaloes need to conceive within 100 to 150 days postpartum. Any deviation or prolongation in the breeding rhythm results in a progressive economic loss through widening of days open, dry period and inter-calving period, reduced calf crop and lactation yield (Kavani *et al.*, 2005) [9]. The productive life of a buffalo can be maximized if it is bred within 100-150 days after parturition to produce a calf and start a new lactation every year (Abdalla, 2003) [1]. Ovarian cyclicity can be induced using various hormone protocols which act on hypothalamic- pituitary-ovarian axis. One of the most classical and widely used hormone protocol for induction of ovarian cyclicity was described by Pursley *et al.*, (1995) [18] named as ovsynch. Mohan *et al.*, (2010) [12] for first time successfully tested Heat-synch protocol in buffaloes, which involved replacement of the second GnRH injection of ovsynch by estradiol benzoate. CIDR is the most recent hormone protocol available. Progesterone is released from CIDR at a controlled rate into the blood stream of the animal and suppresses estrus and ovulation throughout its duration (Lucy *et al.*, 2001) [11].

Material and Methods

The present study was carried out on 24 postpartum anoestrus buffaloes located in different villages around Jaipur (Raj.) and Livestock Farm Complex, Apollo College of Veterinary Medicine, Jaipur (Raj.) which have not exhibited signs of estrus for 90 days or more postpartum. Buffaloes were divided into treatment and control groups. Eighteen postpartum anoestrus buffaloes in the treatment group were further divided into group A, B and C with 6 buffaloes in each sub group. The remaining 6 buffaloes were grouped as anoestrus control

(group D) in which no treatment was given. In group A, animals were subjected to treatment with Ovsynch protocol and were administered GnRH analogue (Buserelin acetate 20 µg i.m) on day 0, followed by PGF2α (Cloprostenol sodium 500 µg i.m) on day 7 and again GnRH analogue (Buserelin acetate 20 µg i.m) on day 9. In group B, animals were subjected to treatment with Heat synch protocol and were administered GnRH analogue (Buserelin acetate 20 µg i.m) on day 0, followed by PGF2α (Cloprostenol sodium 500 µg i.m) on day 7 and then estradiol benzoate 1 mg on day 8. In group C animals were subjected to treatment with CIDR plus Heat synch protocol and animals were administered CIDR (controlled internal drug release device) implant (for 7 days) along with estradiol benzoate (1mg i.m) on day 0 and the implant was removed on day 7, followed by PGF2α (Cloprostenol sodium 500 µg i.m) on day 7 and then estradiol benzoate 1 mg on day 8. Therapeutic efficacies of these regimes were judged on the basis of estrus induction efficiency (%), estrus induction interval (hrs) from the last parentral injection of drug and conception rate after artificial insemination (AI)/Natural service (NS). Pregnancy diagnosis was done by per rectal examination after 60 days following AI/NS.

Result and discussion

Oestrus induction efficiency (66.66, 66.66 and 83.33 per cent), oestrus induction interval (21.25 ± 0.63, 19.25 ± 0.48 and 20.60 ± 0.50 hrs.) and conception rate (50.00, 50.00 and 80.00 per cent) was observed in group A (Ovsynch), group B (Heatsynch) and group C (CIDR plus Heatsynch). None of the buffaloes in control group D exhibit oestrus.

Oestrus induction efficiency

In the present study oestrus induction efficiency was observed in 66.66 per cent buffaloes of group A (Ovsynch), 66.66 per cent buffaloes of group B (Heatsynch) and 83.33 per cent buffaloes of group C (CIDR plus Heatsynch). None of the buffaloes in control group D exhibit oestrus.

Oestrus Induction response as observed in group A was in close approximation with Asokan *et al.*, (2005) [3], who recorded oestrus in 63.63 per cent buffaloes. Contrary to these findings higher oestrus Induction observed by Paul and Prakash (2005) [17] in Murrah buffaloes (90.00%), Naikoo (2009) [13] in anoestrus Mehsana buffaloes (100%) and Kumar *et al.*, (2015) [10] also reported 100% estrus induction. Very low oestrus induction response was found by Awasthi *et al.*, (2007) [4] 33.33 per cent in postpartum Mehsana buffaloes and Ali *et al.*, (2012) [2] 50.00 per cent in postpartum anoestrus buffaloes compare to the present study.

Oestrus induction efficiency as observed in Heatsynch group is Contrary to these findings higher oestrus Induction efficiency observed by Mohan *et al.*, (2010) [12] in non-cyclic buffaloes (100%), Kumar *et al.*, (2015) [10] in postpartum anoestrus buffaloes (100%) and 91.66% in postpartum anoestrus buffaloes (Buhecha *et al.*, 2016) [6].

Oestrus induction efficiency as observe in CIDR + Heatsynch group is in similar agreement with Ali *et al.*, (2012) [2] who reported oestrus response of 83.33% in postpartum anoestrus buffaloes using CIDR plus heatsynch. In contrary to the present findings, much lower estrus induction response of 58.33% was recorded in buffaloes with CIDR protocol by

Ravikumar *et al.* (2009) [21]. Higher oestrus induction was also reported by Naikoo (2009) [13] in Mehsana buffaloes and Zaabel *et al.*, (2009) [25] in anoestrus buffaloes suffering from ovarian inactivity.

Oestrus induction interval

Buffaloes of group A (Ovsynch) exhibited oestrus with a mean post treatment oestrus induction interval of 21.25±0.63 hours. Buffaloes of group B (Heatsynch) exhibited oestrus with a mean post treatment oestrus induction interval of 19.25±0.48 hours, while buffaloes of group C (CIDR plus Heatsynch) exhibited oestrus with a mean post treatment oestrus induction interval of 20.60±0.50 hours respectively from the last parentral administration of drug.

The results are in close approximation with Ali *et al.*, (2012) [2] who could induce oestrus in buffaloes in 18.67±3.18 hours when treated with Ovsynch protocol, 12.75±1.86 hours when treated with Heatsynch and 15.60±2.35 hours when treated with CIDR protocol. On the contrary, Panacarci *et al.*, (2002) [15] observed higher oestrus interval as 29.00±1.80 hours after the administration of estradiol in cows treated with Heatsynch protocol and Zaabel *et al.*, (2009) [25] observed oestrus within 65.2±16.5 hours after the end of treatment. Kumar *et al.*, (2015) [10] observed mean time required for the onset of estrus (h) in Ovsynch, Heatsynch and CIDR plus Ovsynch were 48.50±5.17 h, 38.83±3.69 h and 54.50±2.91 h, respectively.

Conception rate

The conception rate observed in induced oestrus buffaloes after artificial insemination/Natural Service was recorded to be 50.00 per cent in group A (2/4) and 50.00 per cent in group B (2/4), while, 80.00 per cent in group C (4/5), respectively.

In the present study the conception rate (50%) which was higher than Kumar *et al.*, (2015) [10] and Ravikumar *et al.*, (2007) [20] who reported 33.33% when treated with Ovsynch protocol However, comparatively higher conception rate reported by Parmar (2013) [16] as 57.14%, Nakrani *et al.*, (2014) [14] as 73.33% and Thorat *et al.*, (2014) [24] in Marathwadi buffaloes (85.71%).

Conception rate in the present study in Heatsynch group (50%) are similar to Ali *et al.*, (2012) [2] who reported conception rate 50% for buffaloes treated with Heatsynch protocol. While higher pregnancy rates have been reported by Kumar *et al.*, (2015) [10], Asokan *et al.*, (2005) [3] who reported 66.66%. Very low conception rate was also reported by Buhecha *et al.*, (2016) [6] in buffaloes treated with Heatsynch protocols (25%) and Rathore *et al.*, (2017) [19] in anoestrus buffaloes and delayed pubertal heifers (18%) under field conditions following FTAI.

In present finding, overall conception rate of 80.00% was observed in CIDR plus Heatsynch group which was higher than that reported by earlier researchers as 60% in postpartum anoestrus buffaloes Ali *et al.*, (2012) [2] and 70 to 80% in anoestrus buffaloes and crossbreed cows (Savalia *et al.*, 2013) [23]. However, the other workers documented much lower overall conception rate of 12.65% in Iranian buffaloes during low breeding season (Ekrami *et al.*, 2008) [8] and 31.80% in postpartum anoestrus buffaloes (Azawi *et al.*, 2012) [5] from abroad probably due to different agro-climatic and nutritional conditions.

Table 1: Response to various hormone protocols in control and different treatment groups of buffaloes

S. No.	Character	Group A (n=06)	Group B (n=06)	Group C (n=06)	Group D (n=06)
1	Oestrus induction efficiency (%)	66.66 (04)	66.66 (04)	83.33 (05)	0.00 (0)
2	Oestrus induction interval (hrs.)	21.25±0.63 (04)	19.25±0.48 (04)	20.60±0.50 (05)	0.00 (0)
3	Conception rate (%)	50.00 (02)	50.00 (02)	80.00 (04)	0.00 (0)

Figures in parenthesis indicate no. of buffaloes

Conclusion

From the present study it could be concluded that Ovsynch, Heatsynch and CIDR plus Heatsynch can be applied in postpartum anoestrus buffaloes in order to resume ovarian activity and obtain acceptable pregnancy rate.

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