AUGMENTATION OF FERTILITY BY USING HERBAL AND HORMONAL PROTOCOL IN POSTPARTUM ANESTRUS COWS.

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ABSTRACT

The present study evaluated the fertility response and serum progesterone changes in 18 postpartum anestrus (>60 days) cows treated under field conditions with Estrona feeding @ 125g/day/animal for four days (group II; n=6); CIDR-Synch protocol (group III; n=6) and an untreated Control (group I; n=6). The animals were observed for estrus signs and inseminated. The estrus induction rates in group I, II and III were 16.66, 66.66 and 100.00%, respectively with conception rates of 0.00, 50.00 and 66.66%, respectively. The mean serum progesterone concentration (ng/ml) before (0th day) and after (30th day) treatment increased insignificantly (P>0.05) in group II and significantly (P<0.05) in group III but the progesterone on 30th day of treatment compared to other two groups was significantly low in group-I cows. It may be concluded that the feeding of Estrona powder and CIDR-Synch protocol improved estrus induction and conception rates in postpartum anestrus cows.

Key words: CIDR-Synch, Estrus induction, Conception rate, Estrona powder and Postpartum anestrus cows

INTRODUCTION

Anestrus is multi-factorial associated with inadequate nutrition, uterine pathology, environmental stress and improper managemental practices. (Kumar *et al*., 2014). Incidence of anestrus in India has been reported between 2.13– 67.11% in indigenous cattle (Selvaraju *et al*., 2005) and among crossbred cattle between 2.55– 40.4% from different parts of the country. Induction of estrus in postpartum anestrus cows can be achieved by different hormones and different plant extracts or estrus inducing herbal medicines in India (Bhageerathi *et al*., 2009 and Patil *et al*., 2011). Therefore, it is proposed to undertake a study to evaluate the comparative efficacy of herbal formulation and hormonal protocol in post-partum anestrus cows.

MATERIAL AND METHOD

Eighteen animals which did not exhibit estrus after 60 days of postpartum and aged between 4-6 years were selected for the study. All the animals were dewormed with Wormivet powder ® (Rakesh Pharmaceuticals) @ 30 gm BID daily for two days. All these animals were randomly divided into three groups: Group I as control without any treatment; Group II were fed with Estrona® powder (125gm/day/animal) for four days and Group III administered with GnRH @ 20 mcg on 0th day; CIDR on 7th day PGF2α @ 500 mcg along with removal of CIDR and on 9th day GnRH @ 10 mcg and on 10th day insemination was performed on observed estrus. The treatment response was assessed on the basis of estrus induction and conception rate.

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RESULTS AND DISCUSSION

The estrus induction response in group I was 16.66% and is in line with the observations of Bhoraniya *et al*. (2012) and Sahatpure *et al*. (2016) who reported estrus induction rate of 16.67%. However, higher estrus induction (37.5 % and 36.36 %) was reported by Hussain *et al*. (2009) and Sah *et al*. (2013), respectively.

The estrus induction response in group II was 66.66 %. The present findings were similar with observations of Kumar *et al*. (2020) and Roy and Kusum (2020) reported estrus induction rates of 62.50 and 63.33 %, respectively with different herbal medicines. However, higher estrus induction rate was observed by Singh *et al*. (2017) and Mane *et al*. (2018) with an estrus induction rate of 90.00 and 80.00% with Estrona forte bolus in bovines. While, lower estrus induction rates (36.67 and 37.5%) were observed by Tanwar *et al.* (2015) and Raval *et al*. (2017), respectively. This induction in group II might be due to antioxidant, tonic, stimulant restorative, follicular development, ovulatory and galactagogue properties of ingredients like *Zingiber officinale*, *Aloe vera*, *Leptadina reticulate*, *Nigella sative*, *Cyperus scariousus* and *Piper nigrum* present in Estrona powder.

Same in group III was 100.00% and is similar with observations of Bhoraniya *et al*. (2012), Dhami *et al*. (2015) and Kumar *et al.* (2020) (100.00 and 87.50 %, respectively) in postpartum anestrus cows with Ovsynch

plus CIDR and Ovsynch protocol. However, lower estrus induction rate was observed by Ahmed and Doley (2017) with 42.86 % in postpartum anestrus cow treated with Ovsynch. This higher induction rate is attributed to withdrawal effect of progesterone that might have induced follicular development with cyclicity and fertile estrus (Cerri *et al*. 2009).

The conception rate in group I was 0.00 %. The present findings were similar to observations of Kumar *et al*. (2020) but Hussain *et al*. (2009) reported higher conception rate (33.3 %). Same in group II was 50.00% and is similar with observations of Hussain *et al*. (2009), Sah *et al.* (2013) and Sahatpure *et al.* (2016) who have reported a conception rate of 50.00, 61.43 and 66.67%, respectively. However, higher conception rate was reported by Kumar *et al*. (2020) (80.00 %) and lower conception rate was observed by Roy and Kusum (2020) (26.66%). The conception rate in group II might be due to antioxidant, tonic, stimulant restorative, follicular development, ovulatory and galactagogue effect of ingredients like *Zingiber officinale*, *Aloe vera*, *Leptadina reticulate*, *Nigella sative*, *Cyperus scariousus* and *Piper nigrum* present in Estrona powder.

In group III conception rate was 66.66 % and is similar to observations of Haider *et al*. (2017) and Dhami *et al*. (2019) who reported 64.0 and 60.60%, conception rates, respectively. However, higher conception rate was observed by Dhami *et al*. (2015) (80.0%) and lower conception rate was observed by Naikoo *et al.* (2016), Ahmad and Doley (2017) and Kumar *et al.* (2020) (33.33, 28.57 and 57.13 % respectively). The higher conception rate in group III might be due to prolonged exogenous progesterone priming from CIDR device might have caused negative feedback effect on hypothalamo-pituitary gonadal axis and increased receptors for gonadotropins on the ovaries followed by rebound on its sudden withdrawal causing stimulated FSH secretion, folliculogenesis and ovulation (Colazo and Mapletoft, 2014).

SERUM PROGESTERONE

The progesterone concentration (ng/mL) before (0^{th} day) and after (30^{th} day) treatment in group I animals was 0.59±0.04 and 0.85 ± 0.17, respectively. The present findings were similar to Ray *et al*. (2016) reported mean progesterone concentration of 0.45 ± 4.49. However, higher progesterone concentration was observed by Kumar *et al*. (2020) (1.58 ± 0.31). At the end of study one cow was showing cyclicity which explaining near basal level progesterone in this group.

The progesterone concentration (ng/mL) increased in-significantly in groups II with values of 0.39 ± 0.06 and 1.79 ± 0.66 before (0^{th} day) and after (30^{th} day) treatment, respectively. The present findings were similar with Raval *et al*. (2017) who reported an increase on day 20 (3.30 ± 0.43) compared to day 0 (0.45 ± 0.10) in true anestrus Jafarabadi buffalo heifers treated with Prajana. This increase in may be attributed to ovulatory estrus and pregnancy with Estrona.

Similarly, the progesterone concentration (ng/mL) increased significantly (P<0.05) in groups III with values of 0.58 ± 0.06 and 3.18 ± 0.48 before (0^{th} day) and after (30^{th} day) treatment, respectively. These findings were in agreement with Bhoraniya *et al*. (2012) with who reported basal levels of progesterone (0.87 ± 0.54 Vs 1.20 ± 0.46) in (conceived Vs non conceived) animals and significantly (P<0.05) increased to (3.70 ± 0.35 Vs 2.20 ± 0.89) in (conceived Vs non conceived) on day 20 post AI in postpartum anestrus cows treated with Ovsynch + CIDR protocol.

Similarly, Dhami *et al*. (2019) who reported higher progesterone in postpartum anestrus cross breed cows with Ovsynch, Double synch, Estradouble synch on day 12 (2.21 ± 0.98, 1.81 ± 1.02 and 2.28 ± 0.93, respectively) compared with day 0 (0.41 ± 0.11, 0.24 ± 0.07 and 0.28 ± 0.10, respectively). This increase in progesterone concertation may be attributed to presence of corpus luteum during diestrus or pregnancy.

Table 1: Serum progesterone concentration (ng/mL, Mean ± SE) on day 0 and 30 in treated and untreated post-partum anestrus cattle.

Days / Groups	0^{th} Day	30^{th} Day
Group I (PT_0)	0.59^{aA}±0.04	0.85^{aA}±0.17
Group II (PT_1)	0.39^{aB}±0.06	1.79^{aAB}±0.66
Group III (PT_2)	0.58^{aA}±0.06	3.18^{bB}±0.48

NOTE:

- 0^{th} day: Start of treatment, 30^{th} day: on the 30^{th} day of treatment.
- Group I (PT_0): Control, Group II (PT_1): Estrona Feeding, Group III (PT_2): CIDR Synch protocol.
- ^{AB} Different superscript between the columns vary significantly (P<0.05)
- ^{ab} Different superscript between the rows vary significantly (P<0.05)

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