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Effect of used CIDR and vitamin-E and selenium supplementation in treatment of postpartum anestrus buffaloes

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Abstract
This study was undertaken to evaluate the efficiency of used CIDR and vitamin-E-Selenium in treatment of postpartum anestrus buffaloes. A total of 12 postpartum anestrus buffaloes were equally divided into two groups and were treated with used CIDR protocol along with vitamin E and Selenium supplement. Estrus induction response was 66.66% and 83.33% in two groups. Average time required for onset of estrus was 51.83± 16.84h and 62.66± 12.95h, respectively and average duration of estrus was 13.83± 4.53h and 16.50± 3.51h, respectively with no significant difference between groups. The estrus was intense in 0.00% and 20.00%, intermediate in 75.00% and 60.00% and weak in 25.00% and 20.00% in Group II and III, respectively. In most of the animals, the intensity of estrus was intermediate. Most of the animals were having clean and thick cervico-vaginal mucus. The overall pregnancy rates observed in treatment groups were 33.33% and 66.66%, respectively.

Keywords: Postpartum anestrus buffaloes, used CIDR, vitamin E, Selenium

Introduction

Anestrus is a serious problem responsible for reproductive inefficiency of livestock including buffaloes. The duration of postpartum anestrus has an important influence on reproductive performance (Lucy 2007) [22]. It has been suggested that in high-yielding dairy herds, there is increased incidence of anestrus (Berger *et al*. 1981; Opsomer *et al*. 2000) [8, 25]. Perhaps increased partitioning of energy to milk production can result in anestrus by delaying resumption of follicular activity. Anestrus is usually characterized by a lack of ovarian progesterone production and is affected by several factors such as nutrition, milk yield, body condition score at calving, suckling, parity, calving season and other factors (Shah *et al*. 1986, Barile 2005 and El-Wishy 2007) [31, 6, 14].

CIDR has been effectively used to treat anestrus buffaloes (Andukar *et al*. 1997; Singh 2003) [4, 32]. CIDR-B Eazi-Breed is a controlled intravaginal progesterone-releasing device and is made of silicon rubber impregnated with progesterone (1.38 g) and molded over a nylon spine that is T-shaped. Two wings of CIDR fold upon themselves when placed on applicator which is inserted in to vagina. When the applicator is removed from vagina, the wings of the CIDR fold out and apply pressure to vaginal wall, which assists in retaining the CIDR in vagina. A small nylon tail is attached to the end of the CIDR which protrudes from the vulva allowing for easy removal of CIDR. Progesterone concentrations are maintained at a relatively constant level during the seven days insert in the vagina. Upon removal of the insert, progesterone concentrations are quickly eliminated, thus CIDR has been effectively used to treat anestrus buffaloes (Andukar and Kadu 1995; Andukar *et al*. 1997; Singh 2003) [3, 4, 3]. Although a single use of CIDR is recommended by the manufacturer, the residual progesterone content after a 7-day insertion period of the 1.38g CIDR in cattle is 0.72 g (Rathbone *et al*. 2002) [28] thus having the potential for reutilization. Selenium, a component of enzyme glutathione peroxidase (GSH-Px), in combination with vitamin E serves as a biological antioxidant to maintain cellular integrity. The action of vitamin E and selenium appears to be synergistic (Papas *et al*. 1990) [26]. Hence, the present study was designed to study the efficacy of used CIDR device (once used) and effect of Vitamin-E and Selenium on estrus induction and fertility in post partum anestrus buffaloes.

Materials and Methods

In total 12 healthy non-cyclic Murrah buffaloes with a postpartum interval of more than 90 days and aged between 4.5-8 years were selected from R.S. Pura and adjoining villages for a period of 6 months. Buffaloes were gynaeco-clinically examined for confirmation of anestrus ovaries on two per-rectal examinations 7 days apart. The selected animals were assigned to two groups 6 animals in first group were subjected to treatment with CIDR protocol. Used CIDR were inserted on day 0, followed by i/m injection of $PGF_2\alpha$ (Clostenol) 500µg on day 6, followed by removal of used CIDR on 7th day. Remaining 6 animals in second group subjected to treatment with used CIDR plus inj. Vit.E and Se at the rate of 1mg/kg body weight on day 0, followed by i/m injection of $PGF_2\alpha$ (Clostenol) 500µg on day 6, followed by removal of used CIDR plus inj. Vit.E and Se 1 mg/kg body weight on 7th day. Animals were observed for estrus sign.

Results and Discussion

Estrus induction rate, onset of estrus, intensity of estrus and first service conception rates are presented in table 1

Table 1: Estrus induction rate, onset of estrus, intensity of estrus and first service conception rate in anestrus buffaloes treated with used CIDR and UCIDR plus vitamin E Selenium

S. No.	Group	No. of animals treated	Estrus detection rate	Time required for onset of estrus (hours)	Intensity of estrus			The overall pregnancy rate
					Intense	Intermediate	Weak	
1	UCIDR	6	4 (66.66%)	51.83± 16.84	0 (0.00%)	3 (75.00%)	1 (25.00%)	2/6 (33.33%)
2	(UCIDR+ Vit. E and Se)	6	5 (83.33%)	62.66± 12. 95	1 (20.00%)	3 (60.00%)	1 (20.00%)	4/6 (66.66%)

The efficacy of treatment in terms of estrus induction response was 66.66% and 83.33% in buffaloes treated with used CIDR protocol and with CIDR plus vitamin E and Se, respectively. These findings for estrus induction rate are in agreement with earlier reports of Lakra *et al*. (2003) [21], Caesar *et al*. (2011) [10], Azawi *et al*. (2012) [5], Kausar *et al*. (2013) [20] and Naseer *et al*. (2013) [24] who reported 83.30%, 71.4% to 85.7%, 65% to 75%, 80% and 80% estrus induction response in buffaloes. The variation in estrus induction response reported may be due to the re-used CIDR implants. Other factor like breed, age, parity, season and geographical location may also cause variation in response. The mean time required for the onset of estrus was 51.83±16.85 h and 62.67±12.95 h between the treatment groups with no significant difference ($P<0.05$). The findings were in close proximity with Alyas *et al*. (2002) [2] and Caesar *et al*. (2011) [10] who reported an average time required for onset of estrus to be 58.62± 3.19 h and 65.14 ± 11.39 h. Behavioural symptoms of estrus and gynaeco-clinical symptoms of estrus was observed. The characteristic symptoms of estrus observed in various treatment groups were excitement, bellowing, frequent micturation, licking and sniffing of external genitalia, tail reflex, tumification of vulval lips, congestion of vaginal mucus membrane and estrus discharge. Homosexual behaviour was seen in few animals only.

The intensity of estrus in buffaloes treated with used CIDR protocol was found intense in (0.00%), intermediate in (75.00%) and weak in (25.00%) while intense estrus was observed in (20.00%), intermediate in (60.00%) and weak in (20.00%) treated with CIDR along vitamin E selenium. These findings are in close proximity with those reported by Chaudhary (1992) [12] and Ravikumar *et al.* (2009) [29]. Duration of estrus observed was 13.833 ± 4.534 h and 16.500 ± 3.510 h, respectively with no significant difference in duration of estrus between groups. These findings are in agreement with Gill *et al*. (1973) [18] Kanai and Shimazu (1982) [19] and Baruselli (1991) [7]. who reported the average duration of estrus to be 17.65 h, 17.3 ± 4.6 h and 14.76 h, respectively. Fern pattern was typical in (50.00%) animals and atypical in (25.00%) animal and nil in (25.00%) animal treated with CIDR whereas treatment with CIDR along vitamin E selenium showed typical fern pattern was observed in (60.00%) animals, atypical in (20.00%) and nil in (20.00%) animal which was in agreement with the observation of Galhotra *et al*. (1971) [16], Bishnoi *et al*. (1982) [9], Rao and Rao (1981) [27], Salphale *et al*. (1993) [30] and Alyas (2010) [1]. The overall pregnancy rate was 2/6 (33.33%). The findings are in agreement with Cleef *et al*. (1996), Lucy *et al*. (2001), El-Zarkouny *et al*. (2004) [15], Warriach *et al*. (2008) [33], Cerri *et al.* (2009) [11] who reported 46.4%, 26% to 46%, 38%, 36.3% 37.8% to 43.6% pregnancy rate after CIDR use. In animals treated with UCIDR and vitamin E selenium out of 5 buffaloes that comes in heat 3 (60.00%) conceived at first estrus and 1 (20.00%) conceived at second estrus. The overall conception rate was 4/6 (66.66%). These findings are in agreement with Alyas *et al*. (2002) [2], Lakra *et al*. (2003) [21], Gavaga *et al*. (2003) [17] and Naseer *et al*. (2013) [24] who reported 66.67%, 66.66%, 43.3% to 61.8% and 60%. Pregnancy rate observed in buffaloes with CIDR protocol indicates that this protocol is effective in resuming cyclicity and improving fertility in anestrus buffaloes.

Conclusion

Supplementation of vitamin E and selenium to a progesterone based estrus induction protocol can be employed successfully in postpartum anestrus buffaloes to induce estrus and to have better fertility response. Used CIDR is beneficial and can be used for inducing estrus in postpartum anestrus buffaloes. Thus it reduces cost of treatment.

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