SHORT COMMUNICATION

Effect of Different Ecbolic Agents on Postpartum Reproductive Performance in Surti Buffaloes

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Abstract

The study was conducted to evaluate the effect of different ecbolic therapies on puerperium in twenty four Surti buffaloes divided into four different groups consisting of six animals in each. Buffaloes in Group-I (T1) were not given any treatment and considered as control group. Group-II (T2) and Group- III (T3) buffaloes were injected methylergometrine (5 mg) and dinoprost tromethamine (25 mg) i/m, respectively, immediately after parturition. The animals in Group-IV (T4) received oral herbal ecbolic, 100 mL, daily for first 10 days postpartum. The time required for placental expulsion, persistence of lochial discharge, involution of uterus and service period were significantly (P<0.05) longer in T1 (14.86±6.65 h, 12.17±1.94 days, 36.50±4.76 days and 103.33±12.10 days, respectively) than T2 (10.33±2.71 h, 8.83±1.47 days, 33.33±3.61 days and 95.00±8.74 days), T3 (7.00±1.48 h, 8.00±1.41 days, 29.50±1.14 days and 86.50±4.88 days) and T4 (9.38±1.62 h, 10.17±1.47 days, 31.17±3.19 days and 97.80±7.21 days, respectively). The conception rates achieved in T1, T2, T3 and T4 groups/treatment were 50.00, 83.33, 100.0 and 83.33 %, respectively, with an overall conception rate of 79.17 % for all four groups of Surti buffaloes. The results were significantly superior with injection methylergometrine (5 mg) Group III given immediate postpartum, hence may be practiced to improve uterine health and postpartum fertility in buffaloes.

Keywords: Ecbolics, Postpartum fertility, Puerperial period, Surti buffalo.

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Introduction

Surti buffalo (Bubalus bubalis) is an important compact breed of India reared mostly in middle and south Gujarat. The animals are reared by stall feeding and partly by grazing in some areas and provide a steady and substantial regular income through sale of milk, male animals and manure. Therefore, the productive potential of Surti buffalo needs to be exploited in view to amplify the economic returns to poor class of people and to meet the requirements of researchers. To meet the optimum reproductive efficiency our animal should give one calf per year and in order to achieve this goal a farmer should give utmost care during a puerperal period (Bhoi, 2018). The puerperal period is a critical phase in buffaloes which includes reduction of uterine size, regeneration of the endometrium, elimination of bacterial contamination and resumption of ovarian cyclicity (Sheldon *et al.,* 2008). It is desirable that ovarian activity is resumed as early as possible after parturition (Derar *et al.,* 2011). Early initiation of postpartum ovarian activity and improved reproductive efficiency in dairy animals can be achieved using exogenous PGF2α, methyl ergometrine and herbal ecbolics during early postpartum period (Bhoi *et al.,* 2019). The oral administration of herbal preparations with proven ecbolic and restorative actions also appears to be safe and effective option, both therapeutically and prophylactically (Ravi and Bhagwat, 2007). Hence, the present study was aimed to evaluate the comparative efficacy of PGF2α, methylergometrine and herbal ecbolic therapies on puerperal events in Surti buffaloes.

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MATERIALS AND METHODS

The study was carried out from February to December 2021 on twenty four Surti buffaloes having normal parturition at Livestock Research Station, Navsari Agricultural University, Navsari, Gujarat. Ethical permission was granted by the Institutional Animal Ethics Committee (IAEC) of the Veterinary College, Navsari vide experimental protocol No. NAU/VCN/IAEC/LRS/97/2021. The animals were maintained on normal diet including 8-9 kg dry and 12-13 kg green fodder, 2-3 kg concentrate mixture, 30 gm mineral mixture, *ad libitum* water access, and regular deworming and vaccination. The buffaloes were randomly divided into four equal groups comprising six

in each. Buffaloes in Group-I (T1, untreated control) were not given any treatment and served as control group. Group-II (T2) and Group -III (T3) buffaloes were injected immediately after parturition with methylergometrine maleate, 5 mg i/m (Inj. Nexbolic, Intas Pharmaceuticals Ltd.) and dinoprost tromethamine, a natural PGF2α, 25 mg i/m (Inj. Lutalyse, Zoetis), respectively. The animals in Group-IV (T4) received oral herbal ecbolic (Liq. Exapar, Ayurvet Ltd., 100 mL daily for a period of 10 days postpartum. The buffaloes were rigorously observed for postpartum reproductive performance including placental expulsion time, persistence of lochial discharge, uterine involution, first postpartum estrus, service period and conception rate. Uterine involution was monitored using per-rectal examination at every three day interval post-partum.

All statistical analyses were performed using SPSS software (v17.0; SPSS Inc.). The data were analyzed using one-way analysis of variance. The post-hoc Duncan's test was used to determine differences between the groups. Differences of $p<0.05$ were considered significant and $p<0.01$ were considered highly significant as per Steel and Torrie (1981).

RESULTS AND DISCUSSION

The mean time required for expulsion of placenta for T1 was significantly ($p<0.05$) longer than T2, T3 and T4. The mean placental expulsion time was less than twelve h in all the treatment groups (Table 1) which was in agreement with the reports of El-Malky *et al.* (2010). The placental expulsion time was shorter in PGF2α treated group (T3) as compared to methylergometrine and herbal ecbolic treated groups (T2, T4). This finding was in close agreement with the observations of Patel (2014) and Bhoi *et al.* (2019), who used methylergometrine and liq. Utrovet and methylergometrine and bol. Exapar in HF crossbred and Dangi cows, respectively. In the present study the time required for placental expulsion in herbal ecbolic treated (T4) group was shorter as compared to control group (T1), in the present study, which was in accordance with Sahatpure *et al.* (2012) and Thakur *et al.* (2013) using Exapar-N in Nagpuri cattle, Deoni cows and Marathwadi buffaloes.

During involution, there is extensive remodeling of the extracellular matrix together with mitogenesis and apoptosis. The crypts in the caruncular tissue contain trophoblasts (previously known as chorioallantoic cells), which become necrotic and mineralized and either undergoes phagocytosis or are expelled as lochia. Contraction of the myometrial muscle fibers plays a major role in the expulsion of lochia which continues for 10 to 23 days postpartum. Lochia consisted of necrotic and sloughed tissues resulting from the degenerative changes. The mean time for persistence of lochial discharge for T1 was significantly ($p<0.05$) longer than T2, T3 and T4. This finding are in close agreement with the observations of Azawi, (2008) and Adiguzel *et al.* (2021) who reported lochia is normally expelled from the reproductive tract during 9-18 days after calving. The time for persistence of lochial discharge was significantly ($p<0.01$) shorter in PGF2α treated group (T3) as compared to rest of all other treatment and control groups which is in close agreement with Drillich *et al.* (2005), who shorten the postpartum interval by enhancing lochia evacuation using PGF2α in postpartum buffaloes.

The mean time required for completion of uterine involution (days) in T1 and T2 did not differ significantly, but both were significantly ($P<0.05$) higher than T3 and T4. These findings were in agreement with the observations of Bhoi *et al.* (2019), who reported significantly longer time for uterine involution ($P<0.01$) in Exapar treated (33.00±1.77 days) as compared to methylergometrine (28.00±0.57 days) and PGF2α (24.66±0.76 days) treated Dangi cows. The findings of methylergometrine treated (T2) group was in agreement with the observations of Patel (2014), while a shorter time of 14.90±0.48 days was reported by Nosier et al. (2012) in HF cows. The PGF2α played a major role and accelerated the uterine involution in T3, which was in agreement with the observation of Bhoi *et al.* (2019) in Dangi cows. While, slightly shorter duration of 28.71±0.92 days was reported by Patel *et al.* (2013a) in HF cows.

The mean time of first postpartum estrus interval (days) differed non-significantly ($P>0.05$) between T1, T2, T3 and T4. However, apparently shorter period for first postpartum estrus was observed in all the treatment groups as compared to control groups. The first postpartum estrus interval in PGF2α treated group (T3) was much higher than the 28.14 ± 1.68 days and 26.50 ± 0.85 days reported by Patel *et al.* (2013a) and Patel *et al.* (2016) in HF and HF crossbred cows, respectively, treated with 25 mg PGF2α (i/m) immediately after calving.

The mean service period (days) between T1, T2 and T4 did not differ significantly ($P>0.05$), but all were significantly ($P<0.05$) longer than T3. However, shorter service period compared to present study was observed as 76.62 days in PGF2α treated buffaloes by El-Baghdady *et al.* (1990), 68.40 ± 8.00 days in methylergometrine treated Egyptian buffaloes by Ramoun *et al.* (2006) and 73.83 ± 9.48 days in herbal ecbolic treated Surti buffaloes by Patel *et al.* (2013b).

Higher conception rate observed in the PGF2α treated group was in agreement with Bhoi *et al.* (2019) and Nosier *et al.* (2012) in Dangi and dairy cattle, respectively, whereas, Patel *et al.* (2016) reported conception rates to be 83.33 in PGF2α and 66.67 % in Utrovet treated HF crossbred cows.

CONCLUSION

The findings of the study showed that the process of placental separation, uterine involution and resumption of postpartum

ovarian activity was found earlier with higher conception at a shorter service period in PGF2α and methylergometrine treated groups followed by herbal ecbolic treated group compared to control group in Surti buffaloes.

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