Controlled Breeding Techniques for Enhancing Reproductive Performance of Buffaloes

B.N. Parmar, D.M. Patel, H.P. Vijyeta and S.S. Parikh

Department of Gynecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Anand Agricultural University, Anand, 388110, Gujarat, India.

(Received: 29-06-2016 Accepted: 27-09-2016)

Abstract

The experiment was carried out in milk shed areas of Panchamrut dairy on 23 postpartum buffaloes, 16 true anoestrus and 7 normal cyclic under field condition with to evaluate their response to CIDR and Ovsynch protocol by monitoring estrus induction rate, conception rate and plasma progesterone profile following time interval post-treatment/AI. CIDR protocol was found to be better in improving conception rate (66.66 vs. 57.14%) in true anoestrus buffaloes. In general, both the protocols improve conception rates and plasma progesterone level in anoestrus buffaloes, though there was no significant influence on plasma protein and cholesterol profile.

Key words: CIDR, Ovsynch, plasma progesterone, biochemical profile.

Use of hormonal protocols like Ovsynch, controlled internal drug release (CIDR) device and Norgestomet ear implant can be helpful in inducing and synchronizing estrus and thus improves the conception rates and establishes cyclicity in acyclic buffaloes, thereby achieving ideal calving interval. Hence, this study was planned to evaluate the comparative efficacy of CIDR and Ovsynch protocols in anoestrus buffaloes under field conditions in terms of estrus induction response, fertility enhancement, and their influence on plasma progesterone and biochemical profile.

Materials and Methods

The study was undertaken on 16 anoestrus buffaloes and 7 normal cyclic buffaloes kept as control in different villages of Dahod district. Anoestrus animals were confirmed by rectal palpation twice 10 days apart and were subjected to CIDR and Ovsynch Protocols. Normal cyclic animals were inseminated on the day of detection of oestrus. Blood samples were collected from jugular vein in heparinised vacutainers twice or thrice depending upon treatment protocols from the buffaloes for estimation of plasma progesterone and biochemical profile. Plasma progesterone concentration was estimated by employing standard RIA technique of Kubasic et al. (1984). Labelled antigen of assay was 0.1 ng/ml. Plasma total cholesterol was estimated by CHOD/PAP method and total protein by Biuret method using standard procedure and assay kits procured from Crest Bio-system, Goa, with the help of chemistry Analyzer. The observations on estrus response, conception rate and blood profile of plasma $P_4$, cholesterol and protein were analyzed statistically using standard procedure (CRD, t-test) within and between groups for the effect of period and pregnancy status.

Results and Discussion

The present findings of 66.66 per cent conception rates found in CIDR treated true anoestrus buffaloes was similar to the conception rates noted by Caesar et al. (2011) as 66.6 per cent (Table I). The conception rates recorded in the present study was slightly higher than the results obtained by other workers i.e. in true anoestrus buffaloes by Rameez et al. (2012). In contrary to the present findings Zaabel et al. (2009) recorded 100 per cent pregnancy rates in buffaloes treated with CIDR. The three cycle conception rates of 57.14 per cent noted in Ovsynch protocol in true anoestrus buffaloes under present study was found to be similar to conception rates reported by Venkata Ramana et al. (2012) in subestrus buffaloes. However,
it is almost double than the overall conception rates 33.33 per cent reported by Rameez (loc. cit.). These results obtained in the present study suggest that both protocols can serve as better mean for induction of fertile oestrus and ovulation as well as enhancement of conception rate in true anoestrus buffaloes.

Statistical analysis revealed that plasma progesterone (ng/ml) concentration was low on day 0, i.e. on the day of initiation of treatment in both CIDR and Ovsynch protocols (0.58 ± 0.09 and 0.98 ± 0.42 ng/ml), which was increased significantly to peak level on day ‘7’ (3.84 ± 0.43 and 1.76 ± 0.44 ng/ml). A significant drop in plasma progesterone levels within 48 hrs of CIDR removal to the basal values with induction of oestrus (CIDR: 0.50 ± 0.10 ng/ml and Ovsynch: 0.22 ± 0.06 ng/ml). The levels again rose significantly on day ‘21’ post –AI in both the groups (2.45 ± 0.60 and 2.61 ± 0.81 ng/ml) in 3 and 2 buffaloes out of seven each in CIDR and Ovsynch group. Also, in normal cyclic animals group the plasma progesterone concentration was found to be lowest (0.23 ± 0.07 ng/ml) on the day of spontaneous oestrus/AI, which increase significantly on day ‘21’ post-Al (2.00 ± 0.73 ng/ml) again.

Effect of CIDR and Ovsynch protocols of high plasma progesterone concentrations were at par with the findings of Khade (2010). They found significantly higher (P<0.05) plasma progesterone concentrations on day ‘7’ for CIDR and/or Ovsynch protocol. Raghorte et al., (2009) reported plasma progesterone levels in postpar-tum buffaloes on day 21 post-breeding as 3.51 ± 0.22 (6/12) ng/ml in pregnant and 0.81 ± 0.34 ng/ml in non-pregnant animals. The result of the present study suggested that estimation of the plasma progesterone levels by RIA is helpful tool to detect the current reproductive/cyclical status of the animals and to diagnose early pregnancy with reasonable accuracy in freshly bred buffaloes after FTAI.

The present findings revealed no significant differences in plasma total cholesterol profile between days/periods of the treatment with CIDR and Ovsynch protocols or even in normal cyclic group or animals. In CIDR Protocol, findings with respect to total cholesterol profiles in conceived (71.46 ± 14.81mg/dl) and non-conceived (59.41 ± 8.50 mg/dl) buffaloes were found to be at par with the findings of Srivastava and Sahni (2000) in pregnant (74.51 ± 3.51 mg/dl) and non-pregnant (66.20 ± 1.61 mg/dl) buffaloes. Khasatiya et al., (2004b) did not find any significant difference in the levels of plasma total cholesterol on day 0, 7, 14 and 21 of fertile and infertile cycles post-breeding (20 each) in Surti buffaloes. Although the values were apparently lower in fertile than the infertile cycle at most intervals as observed in the present study. This relatively higher serum cholesterol levels were thought to be due to its non-utilization in the body.

| Table I. Effect of CIDR and Ovsynch protocols on oestrus induction response, PG injection to induced oestrus and fertile oestrus intervals and conception rates to FTAI at induced oestrus and overall of three cycles in anoestrus buffaloes. |
|---|---|---|---|---|---|---|---|
| Group | No. of Buff. | Per cent oestrus Response | PG Injection to oestrus Interval (hrs) | PG Injection to Fertile oestrus Interval (days) | Conception Rate (%) |
| CIDR Protocol | 9 | 100% (9/9) | 69.44 ± 1.32 (n=9) | 16.66 ± 6.94 (n=6) | 33.33% (3/9) | 33.33% (2/6) | 25.00% (1/4) | 66.66% (6/9) |
| Ovsynch Protocol | 7 | 100.00% (7/7) | 80.57±3.51 (n=7) | 13.50 ±6.06 (n=4) | 28.57% (2/7) | 40.00% (2/5) | 00.00% (0/3) | 57.14% (4/7) |
| Normal Cyclic Control | 7 | 100% (7/7) | -- | 94.00 ± 5.35* (n=5) | 42.85% (3/7) | 25.00% (1/4) | 33.33 % (1/3) | 71.42% (5/7) |

Figures in parentheses indicate number of buffaloes, *Service period

Controlled Breeding Techniques ...
In Ovsynch Protocol, findings with respect to total cholesterol concentration in conceived (94.29 ± 26.30 mg/dl) and non-conceived (69.99 ± 8.34 mg/dl) buffaloes were similar with the findings of Srivastava and Sahni (loc.cit.). They observed the levels of cholesterol at oestrus/ AI in cows turned out to be pregnant and non-pregnant as 80.29 ± 3.11 and 67.34 ± 1.93 mg/dl, respectively. In the present findings, overall non-significant differences were found in conceived and non-conceived buffaloes in CIDR (67.56± 7.47 vs. 57.38 ± 4.75 mg/dl), Ovsynch (92.27 ± 8.61 vs. 57.38 ± 4.75 mg/dl) and normal cyclic (60.28 ± 4.75 vs. 60.28 ± 60.86 ± 4.80 mg/dl) animals, respectively.

The levels of plasma total proteins did not vary significantly between sampling. The mean plasma total protein concentrations obtained were in accordance with the findings of Kavani et al., (2007). They found no significant variation in serum protein concentration between fertile and infertile cyclic buffaloes. In contrary to the present findings, Lodhi et al., (1998) opined that Murrah buffaloes having high levels of total serum protein had good reproductive performance. The present insignificant difference observed in repeat breeder and normal cyclic buffaloes with regards to total plasma proteins are in agreement with the earlier reports by Butani et al. (2011).

Summary
The study indicates that hormonal therapies used, particularly CIDR and Ovsynch protocol, significantly improved conception rates in anoestrus buffaloes under field conditions. Although they did not influence the plasma metabolic and mineral profile.

References


