The Influence of Dosage of Norgestomet in Syncro-Mate-B regimen on Superovulatory Response, Embryo Quality and Secretory Patterns of Progesterone, Estradiol, LH and FSH in Crossbred Cows.

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In bovine, the use of Syncro-Mate-B (SMB) as a synchronization regimen in Multiple Ovulation and Embryo Transfer (MOET) produced inconsistent results in terms of quantity and quality of embryos. In the present study, we investigated the effects of dosage of norgestomet used in SMB regimen on superovulatory response, quality of embryos and secretory patterns of progesterone (P_4), estradiol (E_2), LH and FSH in crossbred cows. And also the SMB regimen was compared with mid luteal phase $PGF_{2\alpha}$ synchronization regimen during MOET. All the cows selected were in luteal phase. Group 1 (n-10) received single 6 mg norgestomet ear implant and an injection, 3 mg norgestomet and 5 mg estradiol valerate. Group 2 (n-10) received double 6 mg norgestomet implants and an injection as in group 1. The implants were kept *in situ* for 9 days. Group 3 (n-10) served as control and received mid luteal phase superovulatory treatment. In all 3 groups, superovulation was induced with Folltropin-V. Single dose of $PGF_{2\ \alpha}$ was administered at 48h after initiation of FSH injections. Superovulatory treatment was initiated on day 7 of implant period in groups 1 & 2 and on day 9 of the estrous cycle in group 3. AI was done and embryos were collected on day 7 post estrus. In groups 1 & 2, E_2 showed a sharp rise within 24 h and P_4 decreased within 48 h of initiation of SMB treatment. From day 5 to 9 of the implant period, E_2 and LH registered an increasing trend in group 1 and not in group 2. The onset of estrus was significantly ($P<0.05$) earlier in group 1 than in 2 & 3 (36.5, 41.2, 42.4 h respectively). The number of ovulations, total, transferable and nontransferable embryos were 6.3 ± 0.37, 5.7 ± 0.1, 2.2 ± 0.2, 3.5 ± 0.3 in group 1; 8.9 ± 0.5, 7.2 ± 0.3, $5.3+0.1$, 1.9 ± 0.1 in group 2 and 9.2 ± 0.2, 7.4 ± 0.2, 5.6 ± 0.3, $1.8\ \pm0.2$ in group 3 respectively. The number of ovulations, total and transferable embryos were significantly ($P<0.05$) lower in group 1 than in 2 & 3. On the day of initiation of the superovulatory treatment the concentration of P_4 was significantly ($P<0.05$) lower in groups 1 & 2 than in 3, (0.50, 0.52, 2.6 ng/ml respectively). The concentrations of E_2 and LH were significantly ($P<0.05$) higher in group 1 than in 2 & 3 (E_2-105, 77, 70 pg/ml; LH-1.8, 0.6, 0.5 ng/ml respectively). The concentration of FSH was significantly ($P<0.05$) lower in group 1 than in 2 & 3, (45, 55, 58 ng/ml respectively). The onset and peak of LH and FSH surges were significantly ($P<0.05$) earlier (37, 42, 43h), and lower (LH-17, 26, 27; FSH-129, 160, 168 ng/ml) in group 1 than in 2 & 3 respectively. The present study indicated that SMB caused functional luteolysis and decreased the circulatory P_4 to basal level within 48 h of treatment in both the groups 1 & 2. In group 1, single norgestomet regimen influenced the secretory patterns of E_2 and LH during implant, superovulatory, pre and periovulatory periods. Whereas in group 2, double norgestomet regimen did not influence the secretory patterns, on the other hand, it maintained the secretory patterns of E_2 and LH similar to that of mid luteal phase superovulatory regimen, group 3. Based on the results, it could be concluded that single norgestomet, the recommended SMB regimen, produced poor superovulatory response and quality of embryos compare to double norgestomet SMB and mid luteal phase $PGF_{2\alpha}$ synchronization regimens. Further, double norgestomet SMB regimen produced similar response to that of mid luteal phase $PGF_{2\alpha}$ regimen. Furthermore, the present study suggests that two norgestomet implants instead of one could be considered as a better choice to increase the superovulatory response and transferable quality embryos in SMB synchronization regimen during MOET in bovine.

Key words: Syncro-Mate-B, $PGF_{2\ \alpha}$, LH, FSH, P4, E2 synchronization, superovulation, cows.