EFFECT OF OVSYNCH ON PREGNANCY RATE IN CROSSBRED HEIFERS

A.Vijayarajan, C.Chandrahasan and R.Ezakial Napolean

Department of Clinics
Veterinary College and Research Institute Namakkal, Tamilnadu- 637 001.

ABSTRACT

Synchronization of ovulation (Ovsynch) was tested in 10 crossbred heifers using Gonadotropin Releasing Hormone (GnRH) and Prostaglandin $F_2\alpha$ ($PGF_2\alpha$). Another 10 heifers served as control and were inseminated at detected estrous. The onset of estrus was synchronized in Ovsynch group and the percentage of induced estrus was 100 per cent. The first service conception rate was lower for Ovsynch group than the control group. But three animals conceived in the Ovsynch group and none conceived in the control group of animals during the second service.

KEY WORDS: Heifers, Ovulation, Synchronization, Timed insemination, GnRH

INTRODUCTION

Ovsynch is a protocol to synchronize ovulation. This 10 day protocol developed in the mid 1990's (Pursley et al., 1995; Twagiramungu et al., 1995) uses a strategic combination of GnRH (two injections) and PGF2α (one injection) to initiate the growth of a new follicle, induce luteolysis and synchronize ovulation in dairy cows resulting in maximum conception rate. The aim of this study was to assess the efficacy of this protocol in crossbred heifers.

MATERIALS AND METHODS

Crossbred heifers brought to the Gynaecology unit of Namakkal Veterinary college hospital were utilized for this study. Twenty crossbred heifers at random stages of the estrus cycle were selected and assigned equally into two groups namely Group I (Control) and Group II (Ovsynch). Animals of group I served as control and were inseminated at mid heat during natural estrus. The treatment was initiated in animals of Group II on the day of selection irrespective of the stage of the estrus cycle. They were injected with 10 mg of GnRH analogue (Buserelin acetate, Receptal ®, Intervet, UK) and 25 mg of $PGF_2\alpha$ (Dinoprost tromethamin, Lutalyse®, Novartis India Limited, India) intramuscularly on day 0 (Day of initiation of treatment) and 6, respectively. Then they received a second GnRH injection at 48 hours after PGF $_2\alpha$ treatment and artificial insemination was carried out at 16 to 18 hours after the second GnRH injection. All the inseminated heifers were carefully monitored and those returned to estrus were rebred in the subsequent cycle. All the animals were examined per rectum on day 60 post – AI to confirm pregnancy.

RESULTS AND DISCUSSION

All the heifers in Group II exhibited heat signs and the percentage of induced estrus was 100 per cent.

The first service conception rate for control group was 40 per cent (4/10) and none conceived in the second service leading to an overall conception rate of 40 per cent. The first service conception rate for ovsynch group was 20 per cent (2/10). Three out of eight cows conceived in the second service (37.5 per cent) leading to an overall conception rate of 50 per cent. The first service conception rate was higher for control group than the ovsynch treated group (40 Vs 20 Per cent). But the second service conception rate for Ovsynch group was 37.5 per cent, which is closer to the first service conception rate in control group (40 per cent).

It has been suggested that a more rapid turnover of follicular waves in heifers than in lactating cows increases the odds of administering the first GnRH injection in the absence of a dominant follicle and / or turning over a follicular wave before ovulation can be induced with the second GnRH injection (Haughian and Wiltbank, 2002). It has been reported (Pursley et al., 1995) that the ovulation response to the first GnRH treatment is lower in randomly cycling Holstein heifers (54 per cent) than cows (90 per cent). Further it has been reported that GnRH injection initiates the growth of a new follicular wave in cows regardless of the stage of estrus cycle (Pursley et al., 1995), this does not seem to be the case in heifers.

Ambrose et al. (2001) reported that only 50 per cent of randomly cycling Holstein heifers ovulated in response to the first GnRH injection, and similar observations were made by Castilho et al., (2000) who reported 33 to 50 per cent ovulation after a series of experiments they conducted using crossbred dairy heifers.

Moreira et al. (2000) found that when the ovsynch protocol was initiated on Day 2 of the estrus cycle, the spontaneous growth of a new follicular wave had already started. Because a new follicular wave was not initiated in response to the first GnRH injection, the dominant follicle reached a plateau phase sooner and was possibly undergoing early stages of atresia when the second GnRH injection was given. Based on this observation, they concluded that the initiation of the Ovsynch protocol at metestrus may compromise quality of the preovulatory follicle and subsequent competence of the oocyte. Moreira et al (2000) also reported that initiation of the protocol on day 15 of the cycle had a detrimental outcome because all heifers in that group were observed in estrus prior to giving the second injection of GnRH. Collectively, these results suggest that for optimum results, initiation of the Ovsynch protocol should ideally begin in the midluteal phase.

Another problem that is frequently encountered with heifers is the premature onset of estrus (Schmitt et al., 1996 ; Moreira et al., 2000). Consequently, timed – insemination is performed often after ovulation has been taken place, thereby reducing the chances of pregnancy and / or increasing embryonic mortality due to compromised oocyte competence (Ahmad et al., 1995; Austin et al., 1999 and Pursley et al ., 1998).

The possible reasons stated above could be the causes for lower first service conception rate in Ovsynch treated heifers than the control group.

REFERENCES

Ahmad, N., Schrick , F.N., Butcher, R.L.and Inskeep, E.K.,(1995). Biol. Reprod.52:1129-1135.

Ambrose, D.J., Rajamahendran, R., Kastelic, J.P. and Small, J.A., (2001). Arch. Anim. Breeding 44 : 77 – 79.

Austin,E.J., Mihm, M., Ryan, M.P., Williams, D.H. and Roche, J.F., (1999). J. Anim. Sci., 77 : 2219 – 2226.

Castilho, C., Gambini, A.L.G., Fernandes, P., Trinca, L.A., Teixeira, A.B. and Barros, C.M., (2000). Brazilian J. Med. Biol. Res., 33 : 91 – 101.

Haughian, J.M. and Wiltbank, M.C., (2002). Proc. Annual Conference Society for Theriogenology, USA : 221 – 235.

Moreira, F. and Thatcher, W.W., (2000). J.Anim. Sci., 78 : 1568 – 1576.

Pursley, J.R., Mee, M.O. and Wiltbank, M.C., (1995). Theriogenology, 44 : 915 – 923.

Pursley, J.R., Silcox, R.W. and Wiltbank, M.C., (1998). J. Dairy Sci., 81 : 2139 – 2144.

Schmitt, E.J.P., Diaz, T., Drost, M. and Thatcher, W.W., (1996). J.Anim.Sci., 74 :1084 – 1091.

Twagiramungu, H., Guilbault, L.A. and Dufour, J.J., (1995). J.Anim. Sci., 73 : 3141 – 3151.

❑