EFFECT OF SYNCHROMATE-B SYSTEM AND HUMAN CHORIONIC GONADOTROPHIN(hCG) ADMINISTRATION ON FERTILITY RATE IN REPEAT BREEDER COWS

M.Selvaraju , C.Veerapandian, D.Kathiresan, K.Kulasekar and C.Chandrahasan

Department of Animal Reproduction, Gynaecology and Obstetrics,
Madras Veterinary College, Chennai- 600 007.

ABSTRACT

The study was conducted in repeat breeder crossbred cows by control of oestrus using synchromate-B treatment alone or in combination with hCG supplementation at the time of AI. A total of 48 repeat breeder cows were divided into 3 groups. Cows in group I and II were treated with norgestomet ear implants for 9 days. At the time of implant insertion, 2ml of SMB injection was administrated to all these cows. Cows in group III served as control without any treatment. AI was done at 48 (first AI) and 72 (second AI) hours of implant removal in group I and II. Group III cows were artificially inseminated twice at 24 hours interval during natural oestrus. Group II cows were injected with 1500 IU hCG at the time of first AI. There was 100 per cent oestrus response in synchromate-B treated cows. The first service conception rate obtained was 43.75, 56.25 and 18.75 per cent, in group I, II and III, respectively.

KEY WORDS: Synchromate-B, hCG Norgestomet, Fertility rate, Repeat breeder cows

INTRODUCTION

The most commonly encountered and poorly understood condition leading to reproductive failure in bovine is repeat breeding syndrome. Norgestomet ear implant treatments have been found to be highly effective in regulating oestrous cycle in dairy cows and thereby increased the conception rate (Odde, 1990). But luteal dysfunction or altered luteinizing hormone (LH) peak might be the cause of reduced fertility in cattle treated with norgestomet (Favero et al., 1988). This might be due to the insufficient LH production following implant removal (Odde, 1990). Hence the present investigation was undertaken to study the effect of synchromate-B system (norgestomet plus injection) and supplementation of human chorionic gonadotrophin (hCG) at the time of artificial insemination (AI) on fertility rate in repeat breeder cows.

MATERIALS AND METHODS

Forty eight healthy, parous crossbred cows which failed to conceive after three or more AIs at the gynaecology unit of the college were selected for the study. All the selected cows were having regular oestrous cycle of 18-24 days with clear genital mucus discharge during oestrus. Gynaecolgical examination revealed no gross palpable abnormalities and obvious infections of the genital tract in these cows. The cows were divided into 3 groups each comprised of 16 cows. Norgestomet ear implants (Syncromate-B, SMB system, Sanofi, Animal Health Inc., USA) containing 6 mg of synthetic progesterone (norgestomet) were inserted aseptically and subcutaneously in the middle third of the outer surface of the pinna of the ear in all the cows of treatment groups (I &II) using an applicator on day 10 following natural oestrus, together with 2ml of SMB injection i/m containing 5 mg oestradiol valerate and 3 mg norgestomet. The implant was removed after 9 days. Without any treatment, group III cows served as control. In group I and II cows, AI was done twice at 48 (first AI) and 72 (second AI) hours of implant removal. In group II cows, at the time of first AI, 1500 IU of human chorionic gonadotrophin (hCG) was administrated intramuscularly. Group III (control) cows were artificially inseminated twice at 24 hours interval during natural oestrus. Rectal examination was carried out in all the treated and control cows at 60 days after AI to confirm pregnancy. The first service conception rates were compared among three groups.

RESULTS AND DISCUSSION

In this study, norgestomet implants were kept in situ for 9 days. Thimonier et al. (1975) reported that implanting for 13 or 15 days reduced the fertility when compared with implanting for 7 to 9 days in norgestomet treated cows. At the time of implant insertion, 2 ml injection containing 5 mg oestradiol valerate and 3 mg norgestomet was administered intramuscularly to all the cows. Similar treatment protocol was followed by Thimonier et al.(1975) in cyclical cows to induce estrus successfully. Oestradiol valerate has been observed to be luteolytic

when given during the mid-luteal phase of an oestrous cycle (Hansel et al.,1973). Luteolytic response to oestrogen was thought to be meditated through uterine release of $PGF_2\alpha$ (Hixon et al.,1983).

In this study, norgestomet ear implants were inserted 10 days after the natural oestrus in the presence of a mature CL in any one of the ovaries. Similarly, in cows, Pratt et al.(1991) recommended mid luteal phase for induction of oestrus with norgestomet treatment. In the present investigation, 100 per cent oestrus response was obtained following implant removal in treatment group. This was in agreement with the findings of Lokhande et al. (1983) and Odde (1990). The effectiveness of norgestomet in this study might be attributed to the combined effects of progestogen priming on the brain and the direct effect on the hypothalamus by both exogenously administered oestrogen and the high concentration of oestrogen that occurred in association with use of norgestomet- oestradiol (Cavalieri and Fitzpatrick, 1995).

The first service conception rates obtained in group I, II and III were 43.75,56.25 and 18.75 per cent. The conception rate in group I was more or less similar to the conception rate obtained in earlier study with norgestomet (Hixon et al., 1983) and norgestomet- $PGF_2\alpha$ treated cows (Whittier et al., 1986). Many investigators recorded that the first service conception rate ranged from 33 to 68 per cent in norgestomet treated cows (Odde,1990 and Cavalieri and Fitzpatrick,1995). In the present study, the conception rate was found to be higher in group I (43.75 per cent) when compared to control group (18.75 per cent). This increased conception rate might be due to the fixed time breeding of norgestomet treated cows (Cavalieri et al.,1997) and altered secretion of oestrogen and progesterone (Gupta et al., 1998).

In present study, hCG injection at first AI (Group II) resulted in the conception rate of 56.25 (9/16) per cent. More or less similar conception rate was reported after administration of hCG at AI in repeat breeder crossbred cows (Jain and Dave, 1992). Luteal dysfunction was one of the causes of reduced fertility in cattle treated with norgestomet (Rentfrow et al., 1987). Many studies found that administration of endogenous gonadotrophin at the time of insemination resulted in larger corpora lutea and increase in pregnancy rates (Hansel et al.,1973). Futher, higher pregnancy rates were attributed to ovulatory and luteinizing functions of the gonadotrophins (Maurer and Echternkamp, 1982). Therefore, injection of hCG at first AI improved the fertility rate in norgestomet induced oestrus when compared with oestrus induction without hCG supplementation in this study. It is concluded that although SMB system improved the conception rate in repeat breeder cows when compared to control, administration of hCG at the time of AI further increased the fertility rate.

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