Vet.Med.J.,Giza. Vol.41,No.1.(1993):93-96.

HORMONAL TREATMENTS FOR INDUCTION OF OVARIAN CYCLICITY IN POST-PARTUM ANOESTROUS BARKI EWES

By

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(Received:19.1.1993)

SUMMARY

At the beginning of the non-breeding season, 25 Barki ewes in their early post-partum period (21-28 days) were divided into 5 groups (5 ewes per group) and treated as follow: (1) received no treatment (control); Norgestomet ear implant for 13 days plus 500 i.u. PMSG at the time of implant removal; (2) progesterone releasing intravaginal sponge for 13 days ; (4) progesterone releasing intravaginal sponge plus 750 i.u. PMSG at sponge withdrawal ; (5) 30 mg progesterone followed by ram introduction. Blood samples were collected at the end of treatment, during oestrus and 10 days following oestrus. Plasma progesterone was determined using RIA . In the 5 groups 0,80,0,100 and 80 % of ewes showed symptoms of oestrus . The duration from the end of treatment to the onset of oestrus was 78.0± 6.0, 48.0± 16.97, 144.0± 24.00h. in groups 2,4 and 5 respectively. Plasma progesterone for the 5 groups were 0.351 ± 0.105, 3.429 ± 0.672, 2.20 ± 0.72, 0.54 ± 0.27 and 47.03 ± 11.826 ng/ml at the end of treatment ; 0.296± 0.096, 0.597 ± 0.096, 2.635± 1.578, 0.097± 0.04 and 0.314± 0.06 ng/ml during oestrus or expected day of oestrus ; 0.287± 0.109, 1.874± 0.283,0.26± 0.11, 3.68± 0.08 and 2.738± 0.903 ng/ml 10 days following oestrus in the 5 groups, respectively.

The data indicated that Norgestomet PMSG or progesterone releasing intravaginal sponge PMSG or progesterone priming followed by ram introduction could provide a beneficial method for induction of early ovarian cyclicity in early post - partum Barki ewes during the non-breeding season.

INTRODUCTION

The resumption of ovulation and ovarian activity in post-partum ewes can be influenced by season, lactation, nutrition and breed (Mallampati et al., 1971 ; Shevah et al.,1974; Restall and Starr, 1977).However, increasing the frequency of lambing could increase the reproductive efficiency of sheep. It was possible to achieve two lambing every 13 month by using controlled breeding (PRID) and adequate nutrition (Robinson et al. 1975), or by employing controlled breeding (intravaginal FGA + PMSG) to achieve 3.01 lambs/ewe/year (Thimoner and Cognie,1977 and Robinson, 1980) . Moreover, treatment with different progestogens (FGA, implant, Chronogest sponge, Veramix) + PMSG could induce regular oestrus and ovulation in post-partum ewes (Latits, 1987). In addition, the exposure of progesterone primed ewes to rams during post-partum period

could help in reduction of post-partum interval to oestrus and resumption of early breeding activity (Lopez-Sebastian et al. 1987).

In Egypt, it was documented that the highest incidence of normal cyclic activity (breeding season) was observed from September to December whereas the lowest incidence (non-breeding season) was noted from February to August (El-Wishy et al., 1976; Omima Ezzo, 1989 Omima Kandil, 1992). Therefore the aim of the present investigation was to study the effect of different regimens using ear implant + PMSG, progesterone releasing intravaginal sponge, progesterone releasing intravaginal sponge + PMSG, progesterone primed followed by ram introduction on the resumption of ovarian cyclicity in post-partum Barki ewes during the non-breeding season.

MATERIALS AND METHODS

Twenty-five lactating Barki ewes in their early post-partum period (21-28 days) , 3-4 yrs old, were used in this study . The experiment was conducted during February and March, 1992 at the farm of the Animal Reproduction Research Institute, Giza Province . The animals were divided into 5 groups (n=5). Group 1, received no treatment and served as a contol. Group 2 received Norgestomet ear implant (SyncroMate B, Intervet, the Netherlands) containing 3 mg Norgestomet. Ewes were injected with 2 ml solution containing 3 mg Norgestomet and 5 mg oestradiol valerate given at the time of implant insertion (implant remaimed for 13 days) . At the time of implant removal 500 i.u. PMSG (Folligon,Intervet, netherlands) was injected, i.m. Group 3, received a progesterone releasing intravaginal sponge (Veramix, Upjohn, USA) containing 60 mg medroxy progesterone acetate for 13 days. Group 4, was treated as in group 3 plus injection of 750 i.u. PMSG at the time of sponge removal. Group 5. was injected with 20 mg progesterone (Merck, German) and joined with a horness ram.

Oestrus was observed twice daily at 8.00 a.m. and 2.00 p.m. using vasectomized, horness ram as well as the changes in the vaginal epithelium, and confirmed by progesterone analysis.

Blood samples (10 ml) were collected by puncture of the jugular vein into vacutainer heparinized tube before treatment, at the end of treatment, during oestrus or expected day of oestrus as well 10 days following the induced oestrus to confirm the presence of corpora lutea.Blood was centrifuged at 1500 r.p.m. for 20 min. and clear plasma was stored at -20°C pending progesterone assay.

The concentration of progesterone in plasma was determined by direct radioimmunoassay. The antiserum is highly specific for progesterone with a particularly low cross-reactivity to other steroids like 20 and dihydroxy progesterone (2 %) , 11 deoxy corticosterone (1.7 %) and 11-deoxy cortisol (2.4 %) .

The sensitivity of the assay was 0.06 ng/ml and the correlation coefficient between observed and expected values obtained for quantitative recovery of known additions of progesterone was 0.9.

RESULTS

Induction of oestrus and ovulation

The present data showed that 80 % (4/5) 100% (5/5) and 80 % (4/5) of the treated ewes showed symptoms of oestrus in group 2, 4, and 5, respectively. The duration from the end of treatment to the onset of oestrus averaged 78.0± 6.0, 48.0± 16.97, 144.0± 24.00 hr in group 2, 4 and 5, respectively . However , ewes in group 1 and 3 did not show any symptoms of heat (Table 1) . None of the control group showed oestrus during experiment.

Progesterone concentration

Plasma progesterone levels as shown in table 1 revealed that ewes in group 2,4 and 5 were ovulated following oestrus. Hormone level at day 10 post oestrus indicated the presence of mature corpora lutea , while in group 1 and 3 plasma progesterone did not significantly changed.

DISCUSSION

As regards the proper method for induction of oestrus, the data showed that 80 %, 100% and 80 % of ewes in group 2,4 and 5 responded to the

Table (1): Response of ewes to different regimens and plasma progesterone values (Mean ± S.E.) during and after treatment.

Treatment	No. of	No. of responded ewes (%)	Deuration from the end of treatment to the onset of oestrus	Progesterone concentration (ng./ml.)	
				at the end of treatment	Oestrus
Group 1 (Control)	5	0	---	0.351±0.105	0.296±0.096
Group 2 (Synchromate B + PMSG)	5	4 (80%)	78.60±6.00	3.429±0.672	4.597±0.096
Group 3 (Vehicle)	5	0	---	2.200±0.715	2.633±1.578
Group 4 (Vehicle + PMSG)	5	5 (100%)	48.00±16.97	0.54±0.27	0.097±0.01
Group 5 (Progesterone + ram	5	4 (80%)	144.0±24.00	47.03±11.826	0.314±0.06

treatment, while no one of the control or group 3 showed oestrus during treatment. It is clearly evident from the present study that treatment of post-partum ewes with progestogen (intravaginal sponge or ear implant) plus PMSC could induce regular oestrus and ovulation in post-partum ewes . Similar results were obtained by **Mixaillides et al. (1985) and Latits (1987)** . However, the employing of progestogen in the form of progesterone releasing intravaginal sponge alone without PMSG (group 3) failed to induce oestrus and ovarian cyclicity in post-partum ewes . These results are in contrast to that recorded in previous work **(Robinson et al. 1975; Heaney et al. 1980 ; Robinson, 1980).** It is necessary to administered gonadotrophin (PMSG or FSH) in combination to progestogen for the induction of ovarian cyclicity in post-partum anoestrus animal. The objective of treatment with exogenous gonadotrophin is to stimulate the development of a single ovulatory follicle. Once a single preovulatory follicle had begun to develop in response to a supra-threshold dose of FSH,then FSH gradually be reduced whilst maintaining tonic stimulation with LH **(Hillier, 1990).** In group 3, the experimental ewes failed to show ovarian cyclicity. This may be attributed to the continued higher level of progesterone level after sponge withdrawal and during the time of the expected oestrus. The suppression of ovulation by an exogenous progestagen is probably due to an inhibition of luteinizing hormone (LH) release **(Ellington et al., 1964).**

Concerning the effect of progesterone priming followed by ram introduction, the present investigation illustrated that 80% of the ewes (group 5) responded to the treatment and guaranteed subsequent normal luteal development as indicated by plasma progesterone level 10 days following oestrus. These results similarlly to the previous work **(Oldman et al. 1978; Cognie et al., 1982).** The administration of progesterone delayed the timing of the preovulatory LH surge **(Mc Leod et al., 1982)** and resulted in developing preovulatory follicles being exposed to a longe period of stimualtion from plustile LH secretion prior to ovulation **(Hunter et al., 1987)** .

In conclusion treatment of post-partum Barki ewes durig the non-breeding season with progestogen (ear implant or intravaginal sponge) plus MSG induces regular oestrus and ovulation. In addition the administration of progesterone followed by ram introduction into early post-partum wes could induce a beneficial effect in induction of early ovarian cyclicity and represents the economic method of treatments.

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