COMPARATIVE STUDY ON THE TREATMENT OF REPEAT BREEDER FRIESIAN COWS

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SUMMARY

Two trials were carried out in this study. The first involved 104 repeat breeder cows diagnosed with inactive ovaries and divided at random into 4 groups to receive either: intramuscular injection with stilbesterol (group 1), intrauterine infusion with iodine solution "Lotagen" (group 2), combination of stilbesterol and Lotagen (group 3), or intramuscular injection with gonadotrophin releasing hormone (GnRH), (group 4). The GnRH treatment was the most successful in inducing ovarian activity with 85% of the cows coming into oestrus within the first 25 days following treatment, compared with 30,50 and 59% for groups 1, 2 and 3, respectively. About 75% of the GnRH treatd cows came in calf following treatment compared with 20, 40 and 32% in groups 1,2 and 3, respectively.
The second trial involved 70 repeat breeder cows diagnosed with corpus luteum cysts. They were randomly divided into three groups to receive either intramuscular injection with prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$),(group 1), intrauterine infusion with "L tagen",(group 2) or combination of both $PGF_{2\alpha}$ and Lotagen treatments (group 3). Treatment with $PGF_{2\alpha}$ was successful with about 87% of the treated cows coming in oestrus within the first 25 days following treatment and about 67% of the treated cows got pregnant. The corresponding values for group 2 were 34 and 11.5% and for group 3 were 90 and 75 %, respectively.

INTRODUCTION

The success of getting a cow in calf after parturition determines the calving interval and cosequently the number of lactations in the cow's productive life. The length of calving to conception period is influenced by the timing of resumption of ovarian activity and its regularity, the occurrence of oestrus and the ability to detect it. Incidence of ovarian inactivity and persistent corpora lutea have been reported as major forms of ovarian irregularity in large dairy herds (Bulman and Lamming, 1978; Bulman, 1980). Such irregularity in ovarian function may also occur after a cow is inseminated causing conception failure in these problem cows or repeat breeders (Britt et al.,1974 ; Maurer and Echternkamp, 1985).

Attempts to shorten the calving to conception period using exogenous hormone treatments have had varying degrees of success (Peters,1984). These have included the use of gonadotropin releasing hormones GnRH) for treatment of ovarian inactivity (Kesler et al.,1980; Humblot and Thibier,1981) and use of prostaglandin $F_{2\alpha}$ for treatment of persistent corpora lutea (MacMillan and May,1982 ; Peters,1984). Intrauterine infusion with iodine-containg solutions have also been reported as means of treating repeat breeders (Nekara et al.,1971; Oxender and Seguin, 1976; Gupta et al., 1983).

The present investigation was undertaken to study the effect of different treatments in cases of ovarian inactivity and persistent corpora lutea in repeat breeder friesian cows.

MATERIALS AND METHODS

The study was carried out at Sakha Research Station, Ministry of Agriculture. A total of 174 cows ranging from the second to the sixth lactation which calved during the period from November 82 to June 83 were used. In all these cows, no abnormal vaginal discharge or anatomical disorders (cervisitis or

endometritis) was found upon clinical examination. Almost all cows had more than two unsuccessful inseminations. They found not pregnant upon rectal palpation and were notseen in oestrus for at least 40 days after the last insemination(59.1 days on average with a range of 40-88 days). The interval from calving to treatment ranged from 100 to 427 days with an overall average of 166 ± 7.61 days.

Trial 1.(cows with inactive ovaries) : In this trial a total of 104 cows were used. Ovarian examination, through rectal palpation revealed absence of substantial ovarian structure (inactive ovaries) in these cows. They were allocated at random to receive one of the following treatments: (a) group 1,30 cows, each received 5 mg stilbesterol intramuscularly(im), (b) group 2,20 cows, each received 40 ml of iodine containing solution "Lotagen",(Byk Gulden Pharmceuticals,West Germany), intrauterine,
(c) group 3,34 cows, each received 150 ug gonadotrophin releasing hormone (GnRH) synthetic analogue "Gonadorelin" , (Hoechst UK Ltd.).

Trial 2. (cows with persistent corpora lutea): A total of 70 cows were used. They were found to have persistent corpora lutea when palpated rectally. They were allocated at random to receive one of the following treatments :
(a) group 1,24 cows, each received 75 ug prostaglandin $F_2\alpha$ synthetic analogue "Estrumate", (ICI,UK) intramuscularly,
(b) group 2, 26 cows, each received 40 ml "Lotagen" intrauterine,
(c) group 3, 20 cows, each received 75 ug $PGF_2\alpha$ (im) and 40 ml "Lotagen" intrauterine.
The normal heat detection method applied on the farm was followed. Visual observation of standing for mounting was made twice daily, at 0700 and 1500 h, for 40 min. on each occasion.
Throughout the study period the cows used were subjected to the normal management system applied

on the farm. They were housed in a loose housing system and were machine milked twice daily. Artificial insemination, using locally produced frozen semen, was carried out on cows seen in heat following treatment.

RESULTS AND DISCUSSION

Trial 1. (Ovarian inactivity): The highest response to treatment in terms of proportion of cows showing oestrus within the first 25 days after treatment was in the GnRH treated cows (group 4). In this group, 85% of the cows came in oestrus between 6 and 25 days after treatment (Table 1). One fourth of the responding cows in that group showed oestrus between 6 and 10 days after treatment. On the other hand, in the other three groups, all animals which responded to treatments showed oestrus after 11 days. The lowest response was in group 1, treated with stilbesterol alone, where only 30% of the cows came in oestrus between days 11 and 25 following treatment. The combined treatment with both stilbesterol and "Lotagen" resulted in a significant increase ($P < 0.01$) in the response to treatment compared to stilbesterol alone, whilst it resulted in only small and insignificant improvement over that of "Lotagen" alone (group 2).

Out of all cows that responded to different treatments, the GnRH treated animals (group 4) were the earliest to come in heat after treatment (12.3 days) while those receiving the combined treatment of silbesterol and "Lotagen" (group 3) were the latest (18.4 days), (Table 2). The overall differences among groups in the interval from treatment to onset of oestrus were statistically significant ($P < 0.05$). The GnRH treated cows were also the earliest to conceive after treatment (18.2 ± 2.64 days), while those receiving stilbesterol alone were the latest (42.5 ± 6.0 days).

When comparing the interval from treatment to the first oestrus with that to conception (Table 2), it

could be concluded that the GnRH treated cows not only came in heat the earliest after treatment but also they conceived much earlier than other groups. Most of these cows conceived from the first insemination (average number of services per conception of 1.27). On the other hand, cows in group 1 came in heat at a relatively early time after treatment but almost all required more than two inseminations to conceive (average number of services per conception of 2.33). Cows treated with Lotagen alone (group 2) or in combination with stilbesterol (group 3) did not differ much from each other in either the interval from treatment to first oestrus or to conception.

The data presented in table 2 indicate clearly that out of the different methods used for treating cases of inactive ovaries, GnRH treatment was the most successful as it resulted in getting 75% of the treated animals in calf.

The intrauterine Lotagen treatment when given alone resulted in getting 40% of the animals in calf and there was no beneficial effect of combining it with stilbesterol. The high effectiveness of GnRH in initiating ovarian activity found in the present study agrees with the findings of other authors (Britt et al.,1974; Kesler et al.,1980). The administration of gonadotropin releasing hormon to postpartum dairy cows has been shown to stimulate the release of both LH and FSH from the pituitary (Peters and Lamming,1984) resulting in ovulation and resumption of regular oestrous cycles. Furthermore, it seems also that GnRH treatment not only caused the resumption of ovarian function but also the normal function of the reproductive tract as indicated by the low number of services required for conception in responding cows.

Oestrogen treatment may result in the elevation of LH level in the postpartum cow (Schallenberger et al.,1982). It did not appear,however, to result in successful initiation of ovarian function in the present study. Moreover, in the small number of cows

that responded to stilbesterol treatment, it seems that such steroid treatment had adversely affected the normal function of the reproductive tract resulting in the failure of conception at the first oestrus following treatment.
The effect of intrauterine infusion with iodine containing solutions has been attributed mainly to an irritating effect which stimulates uterine contraction and tone, therby increasing uterine blood flow and its mucus secretion (Seguin et al., 1974). The success of using such treatment for repeat breeders has been, however, a subject of considerable controversy with reports of success (Oxender and Seguin, 1976) or failure (Roberts, 1956). The results obtained in the present study do not indicate a significant role of such treatment, however, in the initiation of ovarian activity of repeat breeders.

Trial 2. (persistent corpora lutea):
There was a high response to $PGF_{2\alpha}$ treatment (group 1) in terms of proportion of cows showing oestrus within the first 25 days following treatment (87.5%), (Table 1). All responding animals in this group showed oestrus within the first 10 days after treatment. When $PGF_{2\alpha}$ was combined with the intrauterine "Lotagen" treatment (group 3), there was no detectable difference in the response obtained. Most of the responding cows in groups 1 and 3 came in oestrus within the first five days following treatment. On the other hand, the responseto intrauterine "Lotagen" treatment when given alone (group 2) was significantly ($P<0.01$) less than the other two groups, with only about one third of the cows coming to oestrus within 25 days after treatment.
The interval from treatment to first oestrus, in the responding cows, was shortest in group 1 (3.71 days) and longest in group 2 (16.6 days). The differences between group 2 and each of groups 1 and 3 were significant ($P<0.01$). The latter two did not significantly differ from each other.

Cows in group 1 were the earliest to conceive after treatment (9.8 days) and required less number of services per conception (1.31 + 0.12). On the other hand, cows which responded to "Lotagen" treatment (group 2) were the latest to conceive (21.0 days) and required higher number of services per conception (2.0), (Table 3).

The results shown in table 2 indicate that $PGF_{2\alpha}$ was successful in treating cases of persistent corpus luteum and in getting these animals in calf (66.7%). This finding is in line with those reported by other authors (Humblot and Thibier,1981;Macmillan and Day,1982) and with the well established lutylitic effect of $PGF_{2\alpha}$ (Hafs et al.,1975;Roche and Prendeville,1979; Humblot and Thidier,1981;Macmillan and Day,1982). Intrauterine "Lotagen" treatment was not useful when used alone with only 11.5% of the cows conceived after treatment. This indicates that the irritation and increased uterine blood flow which may result from "Lotagen" treatment (Seguin et al.,1974) did not have detectable effect on the persistent corpus luteum. However,there was a small beneficial effect when combining it with $PGF_{2\alpha}$ (75% of the treated cows conceived).

CONCLUSIONS

It could be concluded from the results of the present study that after ovarian examination of repeat breeders or problem cows,those with inactive ovaries could be treated with a single injection of GnRH with a reasonable degree of success. Cases of persistent corpora lutea could be cured using $PGF_{2\alpha}$.

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Table 1. Incidence of oestrus following treatments in cases of inactive ovaries (trial 1) and persistent CL (trial 2).

Treatment	No. of cows used	No. of cows expressed heat after treatment Days after treatment					Total	
		0-5	6-10	11-15	16-20	21-25	n	(%)
				Trial 1. (inactive ovaries)				
Stilbesterol	30	-	-	6	2	1	9	30.0
Lotagen	20	-	-	2	5	3	10	50.0
Stilbesterol + Lotagen	34	-	-	4	11	5	20	58.8
GnRH	20	-	5	10	2	-	17	85.0
				Trial 2.(persistent CL)				
$PGF_{2\alpha}$	24	19	2	-	-	-	21	87.5
Lotagen	26	-	1	4	1	3	9	34.6
$PGF_{2\alpha}$ + Lotagen	20	11	6	1	-	-	18	90.0

Table 2. Reproductive performance of cows with inactive ovaries (trial 1) following different treatments.

Treatment	No. of cows	No. of insem-inations before treatment ($\bar{x}\pm SE$)	Interval (day) from calving to treatment ($\bar{x}\pm SE$)	Interval (day) from treatment to oestrus ($\bar{x}\pm SE$)	Interval (day) from treatment to conception ($\bar{x}\pm SE$)
Stilbesterol	30	2.57±0.32	159.2±11.8	22.8±2.97 (13)	45.6±5.05 (8)
Lotagen	20	2.60±0.40	183.5±10.6	20.5±1.80 (13)	37.6±2.83 (10)
Stilbesterol + Lotagen	34	1.99±0.34	166.7±4.04	18.9±0.85 (21)	29.8±4.32 (11)
GnRH	20	2.60±0.21	165.1±6.42	12.3±0.62 (17)	18.2±2.64 (15)
Significance of differences among treatments		NS	NS	**	**

- Number in parenthesis indicates the number of responding cows used to calculate the mean value
- NS = Not significant , ** = Significant ($P<0.01$).

Table 2. (Continue)

Treatment	No. of cows	No. of services/ conception after treatment ($\bar{x}$ ± SE)	Conception rate after treatment (%)	No. of cows pregnant cows after treatment No.	%
Stilbesterol	30	2.38±0.25	26.7	6	20.0
Lotagen	20	1.90±0.28	50.0	8	40.0
Stilbesterol + Lotagen	34	1.64±0.23	32.4	11	32.4
GnRH	20	1.27±0.11	75.0	15	75.0
Significance of differences among treatments		*	*		

* = Significant ($P < 0.05$)

Table 3. Reproductive performance of cows with persistent corpus luteum (Trial 2). following different treatments.

Trait	Treatment			Significance of differences
	$PGF_{2\alpha}$	Lotagen	$PGF_{2\alpha}$ + Lotagen	
No. of cows	24	26	20	
No. of inseminations before treatment	3.38±0.69 §	2.77±0.33	3.60±0.34	NS
Interval(days) from:				
calving to treatment	162.2±5.36	170.9±6.85	157.0±3.56	NS
Treatment to oestrus	3.71±0.32 (21)	27.7±2.49 (22)	5.2±0.53 (18)	**
Treatment to conception	9.81±2.33 (16)	47.9±3.51 (12)	14.5±0.26 (15)	**
No.of services/ conception after treatment	1.31±0.12	2.0±0.12	1.47±0.13	**
Conception rate after treatment(%)	66.7	46.2	75.0	
No. of pregnant cows after treatment				
- No.	16	3	15	
- %	66.7	11.5	75.0	

-Number in parenthesis indicates the No. of responding cows used for calculating the mean value
-NS=not significant, ** = significant ($P < 0.01$).
- § ($\bar{x}$±SE)

دراسة مقارنه على معامله أبقار الفريزيان التى يتكرر تلقيحها دون حمل

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أجريت فى هذه الدراسة تجريبتين منفصلتين الأولى تمت على ٧٠ ابقره فريزيان تكرر اعاده تلقيحها دون حمل ولوحظ فيها خمولا فى المبايض قسمت الأبقار الى أربعة مجموعات الأولى عوملت بالحقن فى العضل بهرمون الاستلبستيرول والثانية تم معاملتها عن طريق الحقن داخل الرحم بمحلول يحتوى على اليود والثالثه جمعت بين الحقن بالاستلبستيرول الرحمى أما المجموعة الرابعة فتم معاملتها بالحقن فى العضل بالهرمون المنشط لافراز الهرمونات الجونادوتروفيه .

كانت المعامله بالهرمون المنشط للهرمونات الجونادوتروفيه هى أنجح المعاملات فى احداث النشاط المبيضى حيث حدث الشبق فى حوالى ٨٥٪ من الأبقار المعامله خلال الخمس وعشرين يوما التاليه للمعامله بالمقارنه بـ ٣٠ ، ٥٠ ، ٥٩ ٪ فى المجموعات ١ ، ٢ ، ٣ على الترتيب . كما ثبت حمل ٧٥٪ من الأبقار المعاملة بالهرمون المنشط للهرمونات الجونادوتروفيه بالمقارنه بـ ٢٠ ، ٤٠ ، ٣٢ ٪ فى المجموعات ١ ، ٢ ، ٣ على الترتيب .

أما التجربة الثانية فشملت ٧٠ بقره لم تحمل رغم اعاده تلقيحها وذلك لوجود جسم أصفر متبقى بهما . تم تقسيم الأبقار الى ثلاث مجموعات عوملت الأولى بالبروستاجلاندين بالحقن فى العضل والثانية بالحقن داخل الرحم بمحلول يودى والثانية شملت كلا الحقن بالبروستاجلاندين والحقن الرحمى .

كانت المعامله بالبروستاجلاندين ناجحه حيث حدث الشبق فى ٨٧ ٪ من الأبقار المعامله خلال الـ ٢٥ يوما التاليه للمعامله وثبت حمل ٦٧٪ من الحيوانات المعامله . وكانت الارقام المناظره فى المجموعة الثانية ٣٤ ، ٥ر١١ ٪ وفى المجموعة الثالثة ٩٠ ، ٧٥ ٪ على الترتيب .