



Studies on the Effect of Lugol's Iodine on Reproductive Efficiency of Dairy Cattle

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ABSTRACT

The present investigation was conducted to study the effect of intra uterine infusion of 20 ml Lugol's iodine (0.25 %) on day 5 (Group I; n= 18), day 17 (Group II n= 17) on reproductive performance as compared to untreated animals (Group III; n= 18). The average inter estrus interval in the animals in treatment group I (14.12 ± 0.396 days) was significantly ($P < 0.01$) shorter than group II (23.93 ± 0.330 days) and control group III (20.93 ± 0.870 days). The average duration (days) for first postpartum fertile estrus was shortest (88.93 ± 10.053 days) in group I, followed by group II (106.46 ± 8.743 days) and control group III (113.72 ± 7.131 days). The number of artificial insemination (A.I.) required per conception was observed to be only 1.38 in group I while the values were 1.50 and 1.91 for group II and III, respectively.

Keywords: Lugol's iodine, interestrus interval, conception rate, fertile estrus;

1. INTRODUCTION

Owing to alarming increase in human population of the country and limited land resources, the demand for food has significantly increased. Therefore, the need to explore the potential of livestock resources as possible source of food has emerged as the need of the hour. The optimum production from dairy animals is dependent upon efficient reproduction. Periparturient period has significant value in the life of cows and considerably affects the

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future productivity. Eherenberg et al. (1998) concluded that intrauterine infusion of iodine solution in cows between days 25 and 35 postpartum improved the intrauterine conditions for the following conception as pregnancy rate was significantly higher in the treatment group (79.9%) and findings regarding length of the calving to conception interval was shorter in treatment group. Tapas et al. (2000) reported an almost equal estrus response in animals treated with lugol's iodine and other antibiotic treated group but the shortest post treated estrus duration (6.5 ± 0.78) was recorded in lugol's iodine treated group compared to other groups with almost equal conception rate in each group. Ramoun et al. (2002) reported shortening of estrous cycle with single infusion of 100-150 ml. of lugol's iodine from day 3 to 5 of metestrous cows. They reported a significant difference ($P < 0.01$) for conception rate between cows in lugol's iodine treated and control groups.

Therefore, the present study was undertaken to study the effect of lugol's iodine on post partum dairy cattle.

2. METHODOLOGY

The present study was conducted at Military Dairy farm, Namkom on 53 healthy freshly calved animals managed under identical and optimal conditions of feeding and management. The animals were divided into three groups and were treated as per the following schedule:

Table 1. Treatment schedules for 3 groups of animals used in the present study

Treatment Groups	Number of animals	Treatment schedule
I	18	Intrauterine infusion of 20 ml. (0.25%) Lugol's iodine solution on day 5 of 1st estrous cycle.
II	17	Intrauterine infusion of 20 ml (0.25%) Lugol's iodine solution on day 17 of 1st estrous cycle.
III	18	Left untreated and served as control

Data regarding Interval of Inter-estrus interval, 9 post partum fertile estrus, conception rate and number of AI per conception were recorded in treatment and control groups and the data was subjected to Chi square test as per standard statistical methods (Snedecor and Cochran, 1967).

3. RESULTS AND DISCUSSION

The effect of Lugol's iodine on different reproductive parameters is depicted in Table 3. As evident from the table, the average interestrus interval in the animals in treatment group I (14.12 ± 0.396 days) after intrauterine treatment was significantly ($P < 0.01$) shorter than group II (23.93 ± 0.330 days) and control group III (20.93 ± 0.870 days). No significant difference between interestrus interval was recorded between Groups II and III (control). The finding are in close agreement with Grunert et al. (1973), who also observed a distinctive shortening after the infusion of lugol's solution on days 3 and 4 of cycle which may be due to local luteolytic mechanism initiated by lugol's iodine (inflammation induced) due to its irritant effect. Yamauchi et al. (1966) reported critical period in cattle during which a uterine irritant will shorten cycle length appears to be between days 2 to 6.

The average duration (days) for first postpartum fertile estrus was shortest (88.93 ± 10.053 days) in group I, followed by group II (106.46 ± 8.743 days) and control group III (113.72 ± 7.131 days). The reason for shortening of fertile estrus may be attributed to antimicrobial activity of Lugol's iodine which might have provided more hygienic and conducive environment for the growth of fertilized ovum. Further studies, however, is warranted to justify our findings as there is scanty research available on this aspect.

Table 2. Effect of intra-uterine infusion of Lugol's iodine on reproductive parameters of dairy cows

Groups	Animals treated	Animals conceived	Inter-estrus interval	Duration for first postpartum fertile estrus	Number of AI per conception
I	18	16	14.12 ± 0.396^a	88.93 ± 10.053	1.38^a
II	17	14	23.93 ± 0.330^b	106.46 ± 8.743	1.50^a
III	18	11	20.93 ± 0.870^b	113.72 ± 7.131	1.91^a

Different superscript within the same column indicate significant difference ($P < 0.01$)

In the present study the highest conception rate was observed in group I followed by group II and group III whereas the conception rate with first service was recorded highest in group II followed by group I and group III (Table 2).

Table 3. Effect of intra-uterine infusion of Lugol's iodine on conception rate of dairy cows

Groups	Conception Rate	Conception Rate in 1 st Service
Group I	94.11%	68.75%
Group II	87.50%	71.43%
Group III	73.33%	27.27%

The number of A.I. required per conception was observed to be only 1.38 in group I while the values were 1.50 and 1.91 for group II and III, respectively. The differences observed were non significant in present study as observed by Ehrenberg et al. (1998). Further, they concluded that intrauterine infusion of iodine solution on day 25-35 post partum improves the intrauterine condition of the following conception. The improvement of conception rate and decrease in number of services per conception recorded in treatment groups I and II in the present study were in correspondence with the findings of Ryot et al. (1990) and Tapas et al. (2000).

Singh et al. (1987) opined that better response of Lugol's iodine on conception rate appears to be mainly due to its effect upon uterus and ovary. Lugol's iodine causes local irritation and hyperaemia of uterus and ovaries. Secondly iodine stimulates thyroid gland directly or indirectly through hypophysis. Cyclic activity in the female is governed by hypothalamic-

pituitary–ovarian axis but iodine deficiency can depress thyroid function, affecting fertility indirectly and hypo or hyperthyroidism may reduce the secretion of GnRH through anterior pituitary (Sane et al., 1982). Hypothalamus stimulation due to lugol's application may also influence GnRH release thus initiating the estrous cycle. In the present study higher conception rate in lugol's iodine group might be explained on the above mentioned fact.

4. CONCLUSION

From the above discussion we can conclude the following

- I. Lugol's Iodine influenced the GnRH and initiated the estrus cycle.
- II. It also increased the conception rate by irritation and hyperemia of uterus and ovaries.
- III. The number of service per conception was decreased.

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