SHORT COMMUNICATION

Combined effect of treatment with intrauterine antimicrobials and GnRH on the conception rate of repeat breeder Frieswal cattle

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Abstract: Repeat breeding in cattle inversely affects the profitability of dairy industry by decreasing conception rate. Selected 18 repeat breeder cows reared under ideal farm conditions and divided them into three groups of six animals each viz., group I, II and III with four primiparous cows and two second parity cows in each group. The cows in group I were treated with intrauterine preparation containing aqueous solution of povidone iodine (5%w/v) and metronidazole (1%w/v) (Utrodin IU), followed by uterine lavage with 120 mL of normal saline and inseminated them in oestrus after skipping the first heat. The animals in group II were treated with an IM injection of buserelin acetate (Gynarich) post AI. The cows in group III were treated with both Utrodin IU and Gynarich post AI. The conception rate observed in group I, II and III were 66.67% (4/6 cows), 66.67% (4/6 cows) and 83.33% (5/6 cows), respectively. The results of the study indicated that combined use of intrauterine preparation containing metronidazole and povidone iodine, along with GnRH was more satisfactory than their individual use in improving the conception rate of repeat breeder Frieswal cattle under farm conditions in Kerala.

Keywords: GnRH analogue, Metronidazole, Povidone iodine, Ideal farm conditions, Kerala

Repeat breeding is the major cause of decreased profitability of the dairy industry by reducing the conception rate (Ahmadi and Dehghan, 2007) and increasing the treatment cost. Since it is caused by multiple factors, different treatment strategies have been developed for improving the conception rate. One of the best method is intrauterine treatment with antimicrobials, which restores a healthy uterine environment and improves the fertility (Kumar et al. 2014; Mido et al. 2016). As 40.1% of the total causes of repeat breeding in cattle is hormonal insufficiency (Maurer and Echternkamp, 1985), the hormonal therapy is the most effective method to treat repeat breeders (Tiwari et al. 2019). The administration of GnRH or its analogue, post AI can increase the conception rate in repeat breeder cows (Asaduzzaman et al. 2016; Kaim et al. 2003; Lee et al. 1983). A study was conducted to evaluate the combined effect of intrauterine treatment with metronidazole and povidone iodine and IM administration of GnRH post AI on the conception rate of repeat breeder Frieswal cows of different parity, under ideal farm conditions in Kerala.

Eighteen repeat breeder Frieswal cows reared under ideal farm conditions in Kerala were selected and divided them in to three groups of six animals each viz., group I, II and III. Each group consists of four primiparous cows and two cows in second parity. They were in good health and condition and vaccinated them against prevalent diseases and let loose for three hours of exercise on alternate days. Dewormed the cows with albendazole @ the dose rate of 10 mg/kg body weight orally. The cows were machine milked twice a day and having a milk yield of 3000-4000 kg/lactation. They were fed with chopped Hybrid Napier green grass and concentrate feed containing 20% crude protein and required amount of minerals and vitamins manufactured by School of Applied Animal Nutrition and Feed Technology, College of Veterinary and Animal Sciences, Mannuthy as per the standards set by POP (2016).

The cows in group I were treated with intrauterine preparation containing 60 mL aqueous solution of povidone iodine I.P. 5%w/v (available iodine 0.5%w/v) and metronidazole I.P. (1%w/v) (Utrodin IU Liquid, Nectar Lab Associates, Calicut, Kerala, India), @ the dose rate of 30-60 mL depending on the size and capacity of the uterus. The intrauterine treatment in all animals was followed by 120 mL normal saline lavage to clear out the uterine...
A rise in plasma progesterone concentration (Mehni et al. 2012) can increase CL formation (Kaim et al. 2003). The additional LH may be associated with improvement in conception rate. Administration of single dose of GnRH can increase CL formation (Kaim et al. 2003) and rises in plasma progesterone concentration (Mehni et al. 2012), which is due to hypertrophy and hyperplasia of the luteal cells (Kaim et al. 2003).

Conclusions

Based on the present study, it is concluded that combined effect of treatment with intrauterine preparation containing metronidazole and povidone iodine and GnRH was more satisfactory than using them separately in improving the conception rate of repeat breeder Frieswal cattle under ideal farm conditions in Kerala.

Table 1 The conception rate in treatment groups

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Group I</th>
<th>Conception rate (%)</th>
<th>Group II</th>
<th>Conception rate (%)</th>
<th>Group III</th>
<th>Conception rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utrodin IU</td>
<td>6</td>
<td>66.67%</td>
<td>6</td>
<td>66.67%</td>
<td>6</td>
<td>83.33%</td>
</tr>
<tr>
<td>Gynarich</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utrodin IU and Gynarich</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

All the experimental animals were examined on 60-75 days after insemination by rectal palpation technique to confirm pregnancy. Conception rate in all the groups were documented and the efficacy of the treatment was evaluated on the basis of post-treatment conception rate.

The results of the present study are given in Table 1. Highest conception rate of 83.33% was observed in group III after treatment with Utrodin IU and Gynarich, whereas the conception rate (66.67%) noticed in both group I and group II were equal in the study. A higher conception rate of 53.33% (Jana, 2010) and 83.33% (Butani et al. 2016) was reported after treatment with 5% povidone iodine and 1% metronidazole in repeat breeder cows. Increase in conception rate by 21.5% (Asaduzzaman et al. 2016), 63.2% (Kaim et al. 2003) and 25% (Lee et al. 1983), was documented in repeat breeder cows after GnRH post AI treatment. The improvement in fertility after Utrodin IU and Gynarich treatment in the present study can be due to two reasons. Firstly, intrauterine treatment with povidone iodine and metronidazole would have restored the healthy uterine environment and improved the fertility by reducing the aerobic and obligately anaerobic bacterial count in the bovine uterus (Bogaard et al. 1992; Koujan et al. 1996; Mido et al. 2016).

Secondly, the positive effect of GnRH on improving the ovulation rate (Yaniz et al. 2004), and preventing delayed ovulation (Hamid and Kamruzzaman, 2017). Since the preovulatory surge of LH normally occurs about 6 hours after onset of estrus (Schams et al. 1977), treatment with GnRH at the time of AI may have induced a secondary surge of LH before or after the spontaneous preovulatory surge of LH. This additional LH may be associated with improvement in conception rate. Administration of single dose of GnRH can increase CL formation (Kaim et al. 2003) and rise in plasma progesterone concentration (Mehni et al. 2012) which is due to hypertrophy and hyperplasia of the luteal cells (Kaim et al. 2003).

References


