Efficacy of PGF$_2$α ADMINistration by IVSM route for estrus introduction in post partum cyclic cows

M.N. AMBORE, S.M. GAIKWAD AND R.L. DHOBLE

ABSTRACT
The experiment was conducted to study the clinical efficacy of PGF$_2$α (clostenol) by intravulvo-submucosal route for induction of estrus in cows. Total 30 postpartum cows were selected from Red Kandhari Research and Instructional Farm, COVAS, Parbhani. The animals from group-I (intramuscular route) reported 80 per cent induction of estrus with mean time interval between treatment and onset of estrus as 78.16 hr., average duration of estrus was 20.5 hr while conception rate was found to be 50 per cent. The animals from group-II (IVSM route) also reported 80 per cent induced estrus with mean time interval between treatment and onset of estrus as 76.03 hr, average duration of estrus was 15.78 hr, while the conception rate was 62 per cent.

Key words: PGF$_2$α, Conception rate, Intravulvo-submucosal route

The multiple role of livestock in the socio-economic structure underlines the need for sustainable livestock development particularly in developing countries including India. India has 209.66 million cattle population (Nivsarkar, 1999), which not only produces milk but also draft animals. Livestock is the backbone of India’s economy in terms of income, employment, foreign exchange and earning etc. Reproductive efficiency in dairy herds has a marked effect on profitability.

However, various reproductive problems encountered by the dairy farmers have limiting effect on optimum reproductive performance of dairy animals. Over the past 25 years, researchers have developed reproductive management protocol that synchronized the time of estrus using PGF$_2$α. Synchronization with PGF$_2$α was successful when cow was bred to a detected estrus. Any disease, pathological condition, hormonal, genetic and nutritional imbalance may cause infertility (Robert, 1971). Early maturity, high fertility and short dry period and early post-partum conception are main factors to increase productivity in livestock. Reduced efficiency of reproduction may be caused by various factors like under feeding, hormonal imbalance, disease condition and careless management. These factors are acting either alone or in combination to reduce the fertility. Various studies have shown that fertility of PGF2-α treated cows has improved with successive induced heat. PGF2-α (cloprostenol) induces an additional heat resulting in better fertility. In view of the above, it was planned to study the response of PGF2-α (cloprostenol) for estrus induction and characteristics of the induced estrus in post partum cyclic cows.

MATERIALS AND METHODS
Thirty post-portum cows were selected from Department of Livestock Production and Management, College of Veterinary and Animal Sciences, Parbhani. These animals were examined gynaeco-clinically for presence of corpus luteum on either of ovaries. Information regarding age, number of calving, milk production was derived from farm record. The experimental cows were divided into three groups.

Group-I (n=10) intramuscular route:
All the cows in this group were administered PGF$_2$α analogue (clostenol) 0.5 mg (526 mg) by intramuscular route and 2nd dose was given for the animals which have not exhibited estrus after treatment on day 11 of the previous treatment.

Group-II (n=10) intravulvo-submucosal route:
The cows in this group were administered PGF$_2$α analogue (clostenol) 0.25 mg (263 mg) by intravulvo-submucosal route. Second dose was given for the animal, which have not exhibited estrus after 11 days of previous treatment.

Group-III (n=10) control group:
No treatment was given to these animals throughout the study. All the animals from all the groups were observed at 12 hrs intervals for manifestation of heat signs.
Teaser bull was also used to detect the heat. The animals, exhibiting the heat signs, were naturally bred by fertile bull.

Pregnancy diagnosis:
Per-rectal examination was carried out in all animals 60 days post breeding for pregnancy diagnosis.

RESULTS AND DISCUSSION

Cloprostenol sodium (PGF2α analogue) was administered to the animal by intramuscular route for induction of estrus @ 5 mg/animal. Among the 10 animals in group-I, eight (80%) cows exhibited signs and symptoms of heat, six animals showed estrus after 1st injection and 2 animals showed estrus after 2nd injection of PGF2α (Table 1). The observations of the present study are in close agreement with Chauhan et al. (1986), Pawshe et al. (1991), Mishra et al. (1998), Krishnakumar and Subramaniam (1999) who studied the efficacy of intravulvo-submucosal route for estrus induction in cows and reported the efficacy as 80.0 per cent, 81.75 per cent, 83.33 per cent and 80 per cent, respectively.

Sathiamoorthy and Kathirchelvan (2005) reported the efficacy of 12.5 mg lutalyse administration through intravulvo-submucosal route ipsilateral to ovary containing corpus luteum as 70 per cent, which was lower than the present observations. Ono et al. (1981) and Dugwekar et al. (2003) who reported induction of estrus in Jersey cows 37.9 per cent and 50 per cent, respectively which was lower than the present observation.

Table 1: Comparative response in I/M and IVSM route of PGF2α in cows

<table>
<thead>
<tr>
<th>Group</th>
<th>Total no. of animals</th>
<th>Animals shown oestrus</th>
<th>Average time taken for oestrus onset (hrs.)</th>
<th>Average duration of oestrus (hrs.)</th>
<th>Total no. of conception of animals (%)</th>
<th>Cost of treatment per animal (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 (Intramuscular)</td>
<td>10</td>
<td>8</td>
<td>78.16</td>
<td>20.5</td>
<td>50</td>
<td>140</td>
</tr>
<tr>
<td>T2 (IVSM route)</td>
<td>10</td>
<td>8</td>
<td>76.03</td>
<td>15.78</td>
<td>62</td>
<td>70</td>
</tr>
<tr>
<td>T3 (Control)</td>
<td>10</td>
<td>5</td>
<td></td>
<td>21.2</td>
<td>40</td>
<td>-</td>
</tr>
</tbody>
</table>

The present observations of oestrus induction by PGF2α administrations were in close agreement with Dzido (1981), Pawshe et al. (1991), Kozicki (1994), Agarwal and Umashankar (1997), Reddy et al. (2001) who reported the efficacy of PGF2α for estrus induction in crossbred suboestrus cows as 80.0, 81.75, 71.0, 96.6, 70.0 per cent, respectively. Gacche (2001) reported 84 per cent efficacy of PGF2α (25 mg lutalyse by intramuscular route) for oestrus induction in non-descript cows. Dugwekar et al. (2003) reported 77.78 per cent and 70.0 per cent efficacy in Jersey cows. Sathiamoorthy and Kathirchelvan(2005) reported 80 per cent efficacy of PGF2α for oestrus induction. The present observations are higher than that of Elmarimi et al. (1983), Mane et al. (1992) and Singh et al. (2001). The present observations are lower than Puga et al. (1981), Vukovic et al. (1987), Tanabe and Hann (1984) and Ingawale (2001) who reported the efficacy of PGF2α by intramuscular route as 100.0, 96.7, 90.0 and 100 per cent, respectively.

The cows in group-II (n=10) were administered 0.25 mg PGF2α analogue by intravulvo-submucosal route and eight cows exhibited signs and symptoms of heat after treatment. Thus, the efficacy of PGF2α analogue treatment by intravulvo-submucosal route was 80 per cent (Table 1). The observations of the present study are in close agreement with Chauhan et al. (1986), Pawshe et al. (1991), Mishra et al. (1998), Krishnakumar and Subramaniam (1999) who studied the efficacy of intravulvo-submucosal route for estrus induction in cows and reported the efficacy as 80.0 per cent, 81.75 per cent, 83.33 per cent and 80 per cent, respectively.

Sathiamoorthy and Kathirchelvan (2005) reported the efficacy of 12.5 mg lutalyse administration through intravulvo-submucosal route ipsilateral to ovary containing corpus luteum as 70 per cent, which was lower than the present observations. Ono et al. (1981) and Dugwekar et al. (2003) who reported induction of estrus in Jersey cows 37.9 per cent and 50 per cent, respectively which was lower than the present observation.

Authors’ affiliations
S.M. GAIKWAD AND R.L. DHOBLE, Department of Animal Reproduction, Gynaecology and Obstetrics, College of Veterinary and Animal Sciences, MAFSU, NAGPUR (M.S.) INDIA

REFERENCES


**********

**********