The Indian Journal of Animal Reproduction, 24(1): 65-66, June 2003

SHORT COMMUNICATION

Laparoscopic guided luteal injection of $PGF_2\alpha$ for synchronization of oestrus in cows

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Received: October 25, 2001
Accepted: July 30, 2002

ABSTRACT

Luteal injection of $PGF_2\alpha$ was effective in inducing oestrus in all treated cows. The mean interval between treatment and appearance of oestrus was marginally shorter with luteal injection of 30 µg (57.17±4.83 h) as compared to 750 µg Tiaprost given intramuscularly (62.18±4.83 h). Results of present study suggested that luteal injection of reduced dose of $PGF_2\alpha$ ($1/25^{th}$) was as effective as high dose with I/M route for induction of oestrus in cyclic cows.

Key words: Laparoscopy, $PGF_2\alpha$, Synchronization of oestrus, CL

The use of prostaglandin $F_2\alpha$ and its analogues for regulation of the bovine oestrous cycle has been one of the major advances in the field of animal reproduction during the last three decades. However, the response and degree of synchrony following the routine methods of oestrus synchronization have been too variable to allow timed insemination of all treated cows regardless of oestrus detection (Nebel and Jobst, 1998). Most of the studies in oestrus synchronization protocols with $PGF_2\alpha$ have been conducted with the aim either to synchronize oestrus more precisely or to reduce the dose with a view to reduce the cost. The present investigation was aimed to study the efficacy of lower dose of $PGF_2\alpha$ injected intraluteally for oestrus synchronization in cows.

Six normal cyclic HF cross bred cows, selected from Dairy Farm, IVRI, Izatnagar were used repeatedly for synchronization of oestrus with $PGF_2\alpha$. At the onset, oestrus was synchronized with two injections of $PGF_2\alpha$ (750 µg, Tiaprost, Iliren, Hoechst Roussel Vet) given intramuscularly (I/M) at 11 days apart. In subsequent cycles these animals were further treated with 30 µg Tiaprost injected directly into the corpus luteum (CL) with the help of indigenously developed injection assembly bearing insulin syringe at its one end. The animals were fasted for 16-24 hr and restrained in a cattle crush for laparoscopic visualization. Laparoscopy was performed in standing position with cows under light sedation (xylazine hydrochloride, 8 µg, I/M) and infiltration of 2% lignocain hydrochloride (15 ml, ICI India) at incision site. Two 1.5 to 2.0 cm skin incisions, one in the centre and the other about 10 cm posterior to the first incision were made in the right paralumbar fossa. The trocar and cannula assembly was inserted into the incision site which was followed by visualization of ovaries with a straight forward 0^0 telescope (10mm diameter x 57 cm length, Karl Storz). The other skin incision was also penetrated through trocar and cannula for insertion of injection assembly. However, on two occasions, it was required to use these ports interchangeably to facilitate the drug administration. A pin point bleeding was observed at the site of needle puncture into CL after withdrawal of the needle. Three of these animals were reused 10 days later for injecting 0.2-ml saline into the CL following the laparoscopic technique. Skin incisions were closed by single interrupted suture. Oestrus was detected by visual observation thrice daily at 7:00, 13:00 and 20:00 h for 30 minutes each time and confirmation by palpation per rectum.

Of the six cows synchronized with 750 µg Tiaprost injection (I/M), only 83.3% exhibited oestrus following first PG injection and 100% following second PG injection. All the cows exhibited oestrus following laparoscopic guided

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luteal injection of 30 µg Tiaprost (0.2 ml). However, none of the animal treated with 0.2 ml saline exhibited oestrus signs. There was no significant difference in the percentage of cows coming into heat following its administration either by luteal or I/M route. Bermudez *et al* (1999) also reported that there was no significant difference in the cows coming into heat after $PGF_2\alpha$ treatment among groups receiving lower dose by ultrasound guided intraovarian injection or higher dose by I/M route.

The mean (±SE) interval to oestrus after $PGF_2\alpha$ was not significant (P>0.05) with luteal injection as compared with I/M injection (57.17±4.83 vs 62.18±5.05 h). Several studies on oestrus synchronization with $PGF_2\alpha$ either with I/M (Stevenson *et al.*, 1984), intrauterine (Smith, 1974), intravulvosubmucus (Ono *et al.*, 1982) or ischiorectal fossa (Colazo *et al.*, 2001) routes also indicate a great variation in onset of oestrus following treatment. Curiously, $PGF_2\alpha$ and its analogues have been found to increase production of progesterone by dispersed bovine luteal cells in vitro (Musah *et al.*, 1990).

Results of the present study suggest that luteal injection of reduced ($1/25^{th}$) dose of $PGF_2\alpha$ by laparoscopic method is as effective as the high dose of $PGF_2\alpha$ by I/M route for luteolysis and oestrus induction in cyclic cows. However, similar to I/M injection tight synchrony of oestrus was not achieved with local injection of $PGF_2\alpha$ into the luteal tissue.

ACKNOWLEDGEMENT

The authors are grateful to the Director, IVRI, Izatnagar for the facilities provided. The Director, CIRB, Hisar is thankfully acknowledged for granting study leave to the first author.

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