INDUCTION OF LUTEOLYSIS IN BUFFALOES USING A MICRO DOSE OF $PGF_2\alpha$ ALONG WITH ACUPUNCTURE

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ABSTRACT

A study was conducted on the effect of administration of micro dose of prostaglandin at the BAI HUI acupuncture point for luteolysis and oestrus induction in Surti Buffaloes. The study revealed significant decrease in the concentrations of progesterone at 24 h and 48 h after treatment in buffaloes treated with micro dose of $PGF_2\alpha$ at the BAI HUI acupuncture point as compared with control group of buffaloes.

KEY WORDS: BAI HUI, Acupoint, Buffaloes, Luteolysis, Progesterone, Prostaglandin.

INTRODUCTION

Traditional Chinese medicine has advocated administration of very low or micro doses of certain drugs applied to specific acupuncture points (Klide and Kung, 1977). In veterinary medicine, several authors have recommended treatment at the BAI HUI acupuncture points with human chorionic gonadotrophin (hCG), prostaglandinF2α ($PGF_2\alpha$), and other hormones for treatment of the reproductive disorders such as ovarian cysts in cattle (Lin and Panzer,1992; Turnbull, 1986). The BAI HUI acupuncture point has been frequently used for treatment of uterine and ovarian disorders in mares (Hao, 1987). However, no published studies have demonstrated the effectiveness of using micro doses of hormones to be given at specific acupuncture points in buffaloes. Hence, the present experiment was conducted to examine luteolytic effects of micro dose of PGF2α (0.5 mg, i.e. 1/ 10th of conventional dose) when given at the BAI HUI acupuncture point located at the lumbo-sacral space.

MATERIALS AND METHODS

Total 10 buffaloes ageing from 4 to 14 years having corpus luteum were utilized for the study. In Acupuncture group-I (N=7), buffaloes were administered with 0.5 ml of PGF2α, that represent 1/ 10th of recommended dose, at BAI HUI point located at the lumbo-sacral space. Moreover, acupuncture stimulation for 20 minutes was given at bilateral stomach-36, Spleen-6 and Gall bladder-30 with acupuncture needle along with BAI HUI point. In control group-II (N=3), 0.5 ml of distilled water was administered at BAI HUI point with acupuncture stimulation for 20 minutes on the same points described in group-I buffaloes. Blood samples were collected just before the treatment and after 24, 48 and 72 hrs of treatment and also on day of estrus, and on day 5th and 10th post-estrus. Serum was separated and stored at -20 C till analysed for progesterone and estrogen by radioimmunoassay. Animals were examined clinically for respiration rate and change in behaviour. Animals were checked for estrus signs.

RESULTS AND DISCUSSION

The study revealed significant decrease in the concentrations of progesterone (at 24 h and 48 h after treatment) in buffaloes treated with micro dose of $PGF_2\alpha$ at the BAI HUI acupuncture point as compared with control group of buffaloes (Table 1). The progesterone level dropped significantly

and at a basal level (0.59 ± 0.11 ng/ml) on the day of estrus, whereas estrogen level showed fluctuating but increasing trend in animals of PG treatment group. In animals of control group, progesterone level increased by 24 hrs of placebo treatment (water) at lumbo sacral space instead of micro dose of $PGF_2\alpha$ and decreased by 72 hrs of placebo treatment. Whereas estrogen level showed completely reverse trend, i.e. decreased at 24 hrs and increased by 48 hrs of placebo treatment (Table 1).

The decreasing trend of serum progesterone and increasing trend of serum estrogen concentration in animals of treatment group was correlated with signs of estrus. Estrus was confirmed by per rectal examination of uterus and ovaries on 5th day (n=3) and 8th day (n=4) of treatment in group-I animals. The clinical signs of estrus, viz., persistent bellowing, ropy clear vaginal discharge, mounting on other animals, frequent urination were observed. Inspite of sudden decrease in progesterone and increase in estrogen in animals of control group, none of the animal showed any sign of estrus up to 10 days of treatment. BAI HUI (LS) and L4-L5 (GV3) acupoints somehow provided an extremely efficient pathway for $PGF_2\alpha$ to the ovarian level. Anatomic and physiologic studies have shown an increased amount of nerve plexures as well as vascular and lymphatic vessels under acupuncture points and these structures are associated with several sensory receptors (Smith, 1992).

According to Nie et al. (2001), ovulatory interval was shortened and progesterone concentrations decreased in prostaglandin-treated mares compared with control mares, regardless of dose or treatment site. Mares treated with conventional doses of $PGF_2\alpha$ had greater systemic responses than mares treated with micro doses of $PGF_2\alpha$ or sterile water. Administration of prostaglandins at the BAI HUI acupuncture point does not appear to offer any advantage over administration at standard IM injection sites for induction of luteolysis or to shorten the ovulatory interval. However, administration of a micro dose of the analogue cloprostenol was effective at inducing luteolysis and shortening ovulatory interval regardless of administration site. Controversial studies published by

Table 1. Progesterone and estrogen profile of treatment and control group of buffaloes

Intervals post-treatment	Progesterone (ng/ml)		Estrogen (pg/ml)	
	Control animals (N=3)	PG treated animals (N=7)	Control animals (N=3)	PG treated animals (N=7)
0 hr (Before treatment)	3.03±0.54	2.94± 0.74^{c}	19.67±1.45	15.28± 3.83^{ab}
24 hrs	4.33±0.88	1.76± 0.38^{abc}	14.33±2.63	11.42± 1.11^{a}
48 hrs	--	1.40± 0.33^{ab}		19± 4.57^{abc}
72 hrs	3.53±0.92	1.48± 0.59^{ab}	31.0±7.81	24.85± 4.69^{bc}
Day of estrus (5-8 days from treatment)	--	0.59± 0.11^{ab}	--	28.85± 5.58^{c}
5th day of estrus	--	1.99± 0.52^{bc}	--	16.42± 2.02^{ab}
10th day of estrus	--	1.69± 0.47^{abc}	--	11.28± 0.60^{a}

Figures with different superscripts within the column differ significantly ($P < 0.05$).

Nie et al. (2001) reported that the 1/10th of the conventional dose of $PGF_2\alpha$ induced luteolysis in mares even when administered IM. This is a conflicting data and needs to be better clarified, as ¼th of the conventional dose of $PGF_2\alpha$ was not able to induce luteolysis in mares in another study (Alvarenga et al., 1998).

In conclusion, administration of a micro-dose (1/10th of the conventional dose) of $PGF_2\alpha$ induced estrus and luteolysis in Surti buffaloes.

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