

Management of anoestrus in dairy cattle with placentrex

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ABSTRACT

Placentrex, a patent of human placental extract was used through intravenous route for induction of oestrus in heifers (n = 30) and cows (n = 40) of Jersey x Indigenous crosses (Jr x) and in heifers (n = 43) and cows (n = 6) of Holstein Friesian x Sahiwal crosses (HF x Sh). Heifers in Jr x group exhibited oestrus with an average interval of 14.2 days and resulted in 73.33 per cent pregnancy while cows in Jr x and HF x Sh groups exhibited oestrus with an average interval of 11.7 and 18.5 days respectively and resulted in 87.5 per cent and 75.0 per cent pregnancy respectively. Placentrex was injected at interval of 24 hrs for three days @ 10 ml. to all the heifers and cows in Jr x group while @ 15 ml. was used to cows in HF x Sh group and found to be beneficial for induction of oestrus in anoestrus condition.

Keys words : Anoestrus, placental extract, cattle, estrus, pregnancy

INTRODUCTION

The incidence of anoestrus in dairy cattle is attributed to the causes of defective managerial practices in the farms and involves genetic factors which mar upon the economy of production (Roberts, 1971; Boyd, 1977; Roche *et al.* 1992). True anoestrus condition develops due to temporary suppression of optimum endocrine secretion to activate the ovarian folliculogenesis for optimum recruitment of dominant follicle. Alleviation of the condition against suppression of folliculogenesis with various drugs are well documented (Fernandes *et al.* 1978; Chauhan *et al.* 1984; Rao and Sreemannarayana, 1983; Singh *et al.* 1983; Aboul-Ela and El-Keraby, 1986). Human placental extract is a biological source of three releasing hormones *viz.* Gn-RH, TSH-RH and CRF (Gibbons *et al.* 1975; Lee *et al.* 1981; Khodr and Siler-Khodr, 1978; Khodr and Siler-Khodr, 1980; Shibasaki *et al.* 1981) and its role has not been established in stimulating the follicular growth in true anoestrus condition. Gn-RH has been proved to have its priming effect for follicular growth by release of LH and FSH (Pickering and Fink, 1977; Fernandes *et al.* 1978; Conte *et al.* 1980; McDonald, 1980; Aboul-Ela and El-Keraby, 1986). In the present study, efficacy

of Placentrex (Albert David Ltd., Calcutta-50), a patent prepared form the extract of fresh human placenta has been reported in the treatment of anoestrus and delayed puberty in dairy cattle.

MATERIALS AND METHODS

Altogether 73 heifers and 48 cows of Holstein Friesian x Sahiwal crosses (HF x Sh) and Jersey x Indigenous (Jr x) crosses were used for the present study at different localities of Guwahati and Jorhat suburban area of Assam. The body weight of the heifers and the cows ranged from 200 to 260 kg and 350 to > 500 kg respectively. The age of the Jr x heifers ranged from 30 to 36 months while the age of the HF x Sh heifers ranged from 20 to 24 months. The lactation of the cows varied from second to seventh in both the groups. For description of the animals, the heifers were called anoestrus as they failed to exhibit oestrus signs even though they attained their age of >20 months. Similarly, the cows were called anoestrus as they failed to exhibit their first post partum oestrus within 90 days. Clinical per rectum examinations of both heifers and cows were conducted for two subsequent occasions at 10 days interval and confirmed true anoestrus condition with presence of smooth ovaries.

As for pilot trial, seven heifers and seven cows of Jr x group were injected with 10 ml of Placentrex (Albert David Ltd.) intramuscularly for three times. ad

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24 hours interval. Since the signs of oestrus was not evinced until 21 days after the pilot treatment, subsequent treatment in all the animals was carried out with same dose of Placentrex through intravenous route. A slightly higher dose of 15 ml Placentrex for three days through intravenous route was preferred for the HF x Sh group of cows since the first two cows did not respond to the treatment with only 10 ml for 3 days.

In response to the treatment, when the heifers and the cows evinced oestrus symptoms, they were inseminated within 16–20 hours of the onset of oestrus. Two more chances of inseminations were taken during the subsequent oestruses, when the first insemination during the induced oestrus failed to result in conception. The conception rate was determined based on 60 days non-return rate and finally confirmed by per rectum examination after 90 days.

RESULTS AND DISCUSSION

The results of treatment are presented in Table-1. The HF x Sh group of cows required a higher dose (15 ml) of Placentrex for induction of oestrus which could be due to the large body size of the animal with

higher body weight (≥ 500 Kg). This suggests that the Placentrex acted in the dose dependent manner based on body weight. It is believed that Placentrex which is prepared from the human placenta contains Gn-RH (Gibbons *et al.* 1975; Khodr and Siler-Khodr, 1980; Lee *et al.* 1981) and needed in higher concentration in the circulating blood to stimulate the release of LH and later FSH for follicular growth depending on respective body weight.

The most conspicuous symptoms noticed during the 3 days course of treatment with Placentrex was that irrespective of the age and parity of the animals, the vulva became oedematous from the second day of treatment and became normal in appearance on 5th day. Also, during this period, per rectum examination of the genital organ revealed highly tonous uterus. These symptoms of genital organ were suggestive of increased concentration of oestrogen in the circulating blood. The fact may be such that the Gn-RH present in the patented human placental extract might had stimulated the theca cells of ovarian follicles through LH and FSH for oestrogenic hormone production along with the growth

Table 1. Induction of oestrus using intravenous Placentrex in cattle

Breed	Parity	Dose and course used	Average days required for induction of oestrus	Conception rate (%)			
				1st A.I.	2nd A.I.	3rd A.I.	Overall
HF x Sh (n = 43)	Heifers (age: 20-24 mths)	@ 10 ml, 3 days	—	—	—	—	None
Jr x (n = 30)	Heifers (age: 20-36 mths)	@ 10 ml, 3 days	14.2 ± 5.2 (6–25 days)	40.90	45.45	13.63	73.33
Pooled	Overall in heifers	@ 10 ml, 3 days	14.2 ± 5.2 (6–25 days)	40.90	45.45	13.63	30.13
HF x Sh (n = 6)	Cows (2-5 lact.)	@ 15 ml, 3 days	18.5 ± 11.6 (7–36 days)	66.66	33.33	—	75.00
Jr x (n = 40)	Cows (2-7 lact.)	@ 10 ml, 3 days	11.7 ± 4.3 (7–27 days)	62.85	11.42	5.72	87.50
Pooled	Overall in cows	@ 15 ml & 10 ml, 3 days	12.7 ± 6.5 (7–36 days)	80.48	14.63	4.87	85.41

HF x Sh = Holstein Friesian x Sahiwal; Jr x = Jersey cross.

of follicular wave and ultimately culminate into oestrus (Pickering and Fink, 1977; Webb *et al.* 1977; Fernandes *et al.* 1978; Leslie, 1983; Aboul-Ela and El-Keraby, 1986; Dufour *et al.* 1997). Thus precocious puberty followed by oestrus in heifers were achieved through uniform follicular development by stimulation of Gn-RH (Conte *et al.* 1980; Dufour *et al.* 1997; Tamuli *et al.* 2000). The failure of inducing precocious puberty in the heifers of HF x Sh group might be related to the genetic factor (Roberts, 1971; McDonald, 1980). Because in Sahiwal breed of animals, the age at puberty was recorded around 30 – 34 months of age with average age at first calving by 44 months (Singh *et al.* 1999). It was also recorded that in HF x Sh cows, the age at first calving was 986 ± 12 days suggesting that the HF x Sh heifers conceive around 30 – 32 months of age (Gaur *et al.* 2000).

Most of the animals responded to treatment for inducing oestrus within 6 to 14 days. Oestrus could usually be established within 18 to 23 days after treatment with Gn-RH (Bierschwal *et al.* 1975; Kesler and Garverick, 1982). It was recorded that two of the cows of HF x Sh group were suffering from gonitis on their left side and they took 33 and 36 days respectively to evince oestrus after the Placentrex course (15 ml for 3 days). It was noticed that following treatment with Placentrex, the swellings in joints were healed up satisfactorily within 15 days. The anti-inflammatory healing effect was possibly due to the presence of CRF present in the human placental extract (Gibbons *et al.* 1975, Shibasaki *et al.* 1981) which had probably stimulated the release of natural glucocorticoid through the ATCH activity (McDonald, 1980). The healing effect of human placental extract was also earlier recorded through different experiments (O'Keefe *et al.* 1985; Katharia *et al.* 1992). This may also be true that due to known or unknown pathological conditions, the animal might be suffering from excessive stress where follistatin, an anti-FSH was probably acting against follicular recruitment (Robertson *et al.* 1987; Nakamura *et al.* 1990; Findlay *et al.* 1992). The fact may hold good in the case of these two cows for what there was delay in resumption of oestrus. The role of CRF can be supported with earlier findings that the corticosteroids were successfully used for induction of oestrus in postpartum anoestrus animals (Baldwin and Sawyer, 1974; Nakao and Ono, 1977). It was established too that CRF acts synergistically with the Gn-RH for the release of LH from the anterior pituitary (Baldwin and Sawyer, 1974; Caraty *et al.* 1997) and thus

helps in folliculogenesis. The role of TSH-RH present in the human placental extract may be defined in support of thyroxin hormone which increases the basal metabolic rate and in turn stimulates the proper release of gonadotrophic hormones (Roberts, 1971; McDonald, 1980).

Results indicated that Placentrex is beneficial in alleviating anoestrus condition. Moreover, Placentrex prepared from the extract of fresh human placenta contains releasing hormones which are very low molecular proteins and provides least antigenicity with very short half life and can be used for repeated occasion (Kesler and Garverick, 1982; Chauhan *et al.* 1984). The intravenous route was always preferred, because the intramuscular route failed to yield any response.

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