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COMPARATIVE STUDY OF HORMONAL PROFILE IN PRIMARY UTERINE INERTIA BITCHES

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Abstract: The present study was conducted at Teaching Veterinary Clinical Complex and the Department of Animal Reproduction, Gynaecology & Obstetrics, Nagpur Veterinary College, Nagpur. Out of total 60 uterine inertia bitches (24 complete and 36 partial) the mean progesterone concentration in bitches with complete primary uterine inertia bitches was 7.41± 0.28 nmol/L than that of partial primary uterine inertia bitches as 5.17 ± 0.16 nmol/L. The mean Estradiol concentration in complete primary uterine inertia bitches was 10.63 ± 0.32 pmol/L higher than that of partial primary uterine inertia bitches with 7.30 ± 0.24 pmol/L. The mean Cortisol concentration level in complete primary uterine inertia bitches as 148.61 ± 5.29nmol/L which was lower than that of partial primary uterine inertia bitches as 115.54 ± 2.74 nmol/L.

Keywords: Uterine inertia, Progesterone, Estradiol and Cortisol.

I. INTRODUCTION

Dystocia is defined as the inability to expel foetuses through the birth canal and occurs in about 5 per cent of all parturitions in dogs (Linde-Forsberg and Eneroth, 2000). The cause may be maternal or foetal. The most common form in bitches is primary inertia which can be classified as complete or partial. Primary uterine inertia is the most common reason for dystocia in the bitch approaching 75% of the cases. Primary complete uterine inertia has been recognized as one of the principle causes of dystocia in bitch. In partial primary inertia, the bitch may start to deliver her puppies, but the labour ends prematurely, despite the presence of a patent birth canal. The treatment may be medical or surgical (Van den Weijden and Taverne, 1994).

The hormones progesterone and estrogen play an important role in maintenance of pregnancy and onset of labour, through the constant modulation of myometrium excitability and contractility (Mesiano *et al.* 2002). The main endocrine event during parturition refers to the rapid increase in estrogen/progesterone ratio in the placenta. The decrease in progesterone

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and increasing estrogen concentration possibly trigger detachment of the placenta, dilatation of the cervix and increase in uterine contractility (Concannon, 1986). Estrogen stimulates the onset of labour by enhancing the expression of genes related to myometrium excitability and contraction. Thus, estrogen increases uterine sensitivity to oxytocin progressively during pregnancy (Fuchs, 1983). Therefore the present study was carried out to evaluate progesterone, estradiol and cortisol changes in bitches of treatment and control group.

II. MATERIAL AND METHODS

The research work was conducted at Teaching Veterinary Clinical Complex and Department of Animal Reproduction, Gynaecology and Obstetrics, Nagpur Veterinary College, Nagpur. Total 60 bitches (irrespective of age, size and breed) with the history and clinical signs of complete and partial primary uterine inertia were diagnosed. The clinical cases of dystocia presented were subjected to a detailed clinico-obstetrical examination to identify the cause of dystocia. The causes of dystocia were broadly categorized as foetal or maternal in origin as per criteria of Arthur *et al.* (1989). Cases of maternal dystocia were categorized into primary uterine inertia, secondary uterine inertia and dystocia due to gross abnormalities of the maternal birth canal. Blood samples were obtained from bitches suffering from uterine inertia at the time of presentation at clinic before the administration of any treatment and separated serum was stored in epindroff tube for progesterone, estradiol and cortisol concentration assay at -20°C. The method used for the estimation of hormone was carried out by preparing standard stock solutions of 1 mg/ml of estradiol, progesterone, and cortisol in methanol. Standard solutions of estradiol, progesterone, and cortisol in methanol at concentrations of 100 ng/ml were prepared from the stock standard solution and injected into the instrument and peak area was noted. Estradiol, progestrone, cortisol analysis was performed using the Thermo System.

III. RESULT & DISCUSSION

Table 1: Serum concentrations of progesterone, estradiol and cortisol in bitches with primary uterine inertia

Hormone	Progesterone (nmol/L)	Estradiol (pmol/L)	Cortisol (nmol/L)
CPUI	7.41 ± 0.28^{a}	10.63 ± 0.32^{b}	115.54 ± 2.74^{a}
PPUI	5.17 ± 0.16^{b}	7.30 ± 0.24^{a}	148.61 ± 5.29^{b}
Overall mean	6.29 ± 0.30	8.96 ± 0.42	132.07 ± 4.75

Note: The superscript alphabet indicates difference between means of complete & partial primary uterine inertia for each parameter at 5% level of significance

Serum Progesterone (nmol/L):

Table 1 presents mean progesterone concentration complete primary uterine inertia bitches was 7.41±0.28 nmol/L which significantly higher ($p<0.01$) than that of the partial primary uterine inertia bitches which 5.17 ± 0.16 nmol/L. While the overall mean concentration of progesterone in uterine inertia bitches was 6.29±0.30 nmol/L. The levels of serum progesterone were much higher than the normal levels in cases of uterine inertia. Present findings are in accordance with Concannon *et al.* (2000) who stated that the level of progesterone concentration typically declines from 12 - 15 nmol/L to near or below 6 - 7 nmol/L during the 24 hours before the onset of labour which was in accordance with the present findings of overall concentration of progesterone (6.29 ± 0.30 nmol/L) in uterine inertia bitches. The levels were comparable to the reference values from normal whelping bitches reported by several authors, which indicated that lack of ability to diminish progesterone concentration hormone at the time of whelping towards the basal level may possibly participate its essential role in the development of uterine inertia in bitches.

Serum Estradiol (pmol/L)

Table 1 presents mean estradiol concentration in complete primary uterine inertia bitches was 10.63 ± 0.32 pmol/L which significantly higher ($p<0.01$) than that of bitches suffering from partial primary uterine inertia which 7.30 ± 0.24 pmol/L. The overall mean concentration of estradiol in bitches suffering from uterine inertia was 8.96 ± 0.42 pmol/L. During the present findings, concentration of estradiol hormone differed significantly in between complete and partial primary uterine inertia bitches but the values were within reference range at the time of whelping as also documented by Baan *et al. (*2008). Therefore, from the present observations it can be opined that serum estradiol concentrations had no significant role in causing uterine inertia in bitches.

Serum Cortisol (nmol/L)

Table 1 presents the mean cortisol concentration level in bitches with complete primary uterine inertia as 148.61 ± 5.29nmol/L which was significantly lower ($p<0.01$) than that of partial primary uterine inertia bitches (115.54 ± 2.74 nmol/L). The overall mean concentration of serum cortisol in bitches with uterine inertia was 132.07 ± 4.75 nmol/L. The present findings are in accordance with the findings reported by Bergstrom *et al. (*2010) who investigated plasma cortisol concentrations in bitches diagnosed as primary uterine inertia and stated that the values were not differed between the groups. Even if there was a significant difference in between the complete and partial primary uterine inertia bitches, the

overall mean concentration of cortisol during uterine inertia was in reference range with that eutocia bitches, which indicated that serum cortisol is not involved in the occurrence of uterine inertia in bitches.

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