HAEMATOLOGICAL AND SERUM BIOCHEMICAL ALTERATIONS IN UTERINE INERTIA AFFECTED BITCHES

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The proposed research work, haematological and serum biochemical alterations in uterine inertia affected bitches were conducted at Veterinary Clinical Complex. The data relating to the present investigation were obtained from the obstetrical records of dystocia cases as well as from clinical cases of uterine inertia presented. Total 60 bitches irrespective of age, size and breed with the history and clinical signs of complete and partial primary uterine inertia chosen for the study. Physical examination and digital vaginal palpation in combination with diagnostic imaging were used to confirm the diagnosis. Blood samples were collected from all 60 bitches with both complete and partial uterine inertia in all five groups of bitches before treatment and after whelping to study the changes in levels of serum Calcium, Glucose, Phosphorus, Magnesium, Potassium, Sodium, BUN, Creatinine, Total Protein, Albumin estimations and hematological parameters viz. Hb, TLC, TEC, PCV and platelets.

Keywords: Bitches, Dystocia, Haematological, Serum biochemical, Uterine inertia..

Canine and feline reproductive and pediatric difficulties are commonly encountered emergencies due to a combination of factors, including small animal anatomy and owner ignorance. - 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). Primary uterine inertia is the most common reason of dystocia in the bitch approaching 75% of the cases The condition is characterized by the failure of uterine muscle to expel normal sized foetuses through a normal birth canal, except an incompletely dilated where this is either completely absent, weak or infrequent. In partial primary inertia, the bitch may start to deliver her puppies, but the labor ends prematurely, despite the presence of a patent birth canal. The treatment may be medical or surgical (Van den Weijden and Taverne, 1994).

Calcium is the most important electrolyte regulating myometrial contractions. The myometrial resting membrane potential is generally -35 to -60 mV, being low during most of pregnancy and increasing near term (Sanborn, 2000). It has been proposed that hypoglycemia is the cause of primary uterine inertia, particularly in small breeds of bitches (Linde-Forsberg and Enerboth, 2000). The intravenous crystalloid solutions are administered to correct fluid, electrolyte and acid-base imbalances. The purpose of this study was to investigate if bitches with uterine inertia have low concentrations of any of the haematobiochemical substances in the blood and to evaluate the outcome of five medical treatments followed by caesarean section in unresponsive bitches.

Materials and Methods

Total 60 bitches irrespective of age, size and breed with the history and clinical signs of complete and partial primary uterine inertia were selected. Physical examination and digital vaginal palpation in combination

with diagnostic imaging were used to confirm the diagnosis.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. Cases of maternal dystocia were categorized into primary uterine inertia, secondary uterine inertia and dystocia due to gross abnormalities of the maternal birth canal. The collected data was statistically analyzed.

Complete primary Uterine Inertia

The diagnosis of dystocia due to primary uterine inertia was made, if the animal presented had a history of completion of pregnancy term, complete absence or the presence of very weak signs of first stage of labor, and the presence of greenish or blackish- green lochia on the perineum, vulval or vestibule for at least two hours. In some cases when the history was suggestive of complete primary uterine inertia, but there was no evidence of lochia in the perineum, per vaginal examination was done with the help of finger to identify presence of discharge.

Partial primary uterine Inertia

The diagnosis of dystocia due to partial primary uterine inertia was made, if the second stage of labor had begun, one or more pups had been delivered at least two hours before, but subsequently either there was complete absence of straining or the presence of only weak efforts by the animal to expel the puppies.

Hematological and blood biochemical investigations

Blood samples were collected from all 60 bitches with both complete and partial uterine inertia in all five groups of bitches before treatment and after whelping to study the changes in levels of serum Calcium, Glucose, Phosphorus, Magnesium, Potassium, Sodium, BUN, Creatinine, Total Protein, Albumin estimations and hematological parameters viz. Hb, TLC, TEC, PCV and platelets.

Results and Discussion

Blood samples were obtained from 60 bitches suffering from uterine inertia to investigate the changes in hematological and serum biochemical parameters before the administration of treatment and after normal whelping or after successful caesarean section within 6 hours of duration.

Hematological changes before treatment and after whelping

During the present course of study, various hematological parameters viz. Hemoglobin, Total leucocyte count, Total erythrocyte count, PCV and Platelets were studied before the start of treatment and after the completion of whelping or after the successful caesarean section in all the bitches suffering from uterine inertia. Out of total 60 cases of primary uterine inertia treated during the course of present investigation, medical therapy was successful in 20 bitches (33.33%) and the remaining 40 animals (66.67%) had to be subjected for caesarean section due to failure of complete natural whelping with the medical treatment.

Table 1:Hematological values at pre-treatment and post whelping (Mean ± SE)

No of Bitches N=60	Hb (gm/dL)		TLC(thousand /cumm)		TEC(millions /cumm)		PCV (%)		Platelets (Lakh/cumm)	
	Before	After	Before	After	Before	After	Before	After	Before	After
Complete uterin -e inertia (n=24)	9.68 ±0.17	8.13 ±0.16	18.36 ±0.59	17.31 ±0.63	6.24 ±0.27	5.77 ±0.27	32.15 ±0.83	31.95 ±0.83	339.38 ±9.23	326.13 ±9.52
Partial uterine inertia (n=36)	9.82 ±0.15	8.26 ±0.15	19.33 ±0.59	18.17 ±0.54	6.50 ±0.20	5.92 ±0.21	32.14 ±0.56	31.83 ±0.58	328.64 ±7.84	317.89 ±7.86
Overall mean	9.71	8.16	18.94	17.82	6.49	5.93	31.84	31.58	332.93	321.1

	±0.11	±0.11	±0.43	±0.41	±0.16	±0.16	±0.48	±0.49	±6.02	8±6.08

The differences in the hematological parameters were non-significant and the values were within normal physiological range. Therefore, it may be concluded that the mean hematological parameters do not hange in complete or partial primary uterine inertia. In bitches. The mild decrease in the values of Hemoglobin, Total leukocyte count and platelet count recorded during and following the completion of surgery might have been due to splenic pooling of blood during the period of anesthesia. It is also possible that the marginal decrease in the hematological parameters recorded in the present study during and after surgery is due to haemodilution as all the animals received an intravenous infusion of a balanced electrolyte solution throughout the period of surgery and during the recovery period. Similarly it is also well known that the anaesthetic protocols, surgical stress and labour do affect these vital parameters, although transiently. The decreased volume of PCV at the time of whelping could be due to more litter size. The dam and fetuses have an increased metabolic demand and to meet this demand; maternal blood volume progressively increases by approximately 40 % during pregnancy. The increase in plasma volume is proportionally greater than the increase in erythrocytes leading to hemodilution and relative anemia as also mentioned by Pascoe and Moon, 2001).

Biochemical changes before treatment and after whelping

During the present course of study, the biochemical parameters studied were Blood Urea Nitrogen, Serum Creatinine, Serum Calcium, Serum Phosphorus, Serum Magnesium, SerumPotassium, SerumSodium, Blood Glucose, Serum Total Proteins and Serum Albumin before the start of treatment and after the completion of whelping or after the successful caesarean section in 60 uterine inertia bitches. The values in complete primary uterine inertia and partial primary uterine inertia are depicted in Table 2.

Table 2. Sodium, Calcium, Phosphrous, Magnesium, and Potassium changes before treatment and after whelping in uterine inertia bitches (Mean± SE).

Bitches N=60	Sodium (mmol/L)		Calcium (mg/dL)		Phosphrous (mg/dL)		Magnesium (mg/dL)		Potassium (mmol/L)	
	Before	After	Before	After	Before	After	Before	After	Before	After
Complete uterine inertia (n=24)	148.88 ±1.6	148.73 ±1.7	9.00 ±0.15	8.91 ±0.14	4.25 ±0.13	3.9 ±0.11	2.08 ±0.05	2.0 ±0.06	4.52 ±0.18	4.2 ±0.14
Partial uterine inertia (n=36)	148.85 ±1.19	148.27 ±1.19	9.49 ±0.19	9.32 ±0.17	4.8 ±0.18	4.7 ±0.16	2.0 ±0.05	2.0 ±0.05	4.2 ±0.12	4.2 ±0.14
Overall mean	148.86 ±0.96	148.45 ±0.97	9.29 ±0.13	9.16 ±0.12	4.6 ±0.13	4.4 ±0.12	2.0 ±0.03	2.0 ±0.04	4.3 ±0.10	4.2 ±0.10

The differences were non-significant and the values were within normal physiological range for sodium, calcium, potassium. Therefore, it was concluded that the mean concentration levels did not change in complete or partial primary uterine inertia bitches.On the other hand, Fomin *et al.,* 2006 documented that Magnesium causes both smooth muscle relaxation and inhibition of myometrial contraction by both intracellular and extracellular mechanisms and therefore, Magnesium may be of importance when evaluating causes of dystocia. However, during the present investigation, the values of Magnesium in all the groups were normal physiological range. Therefore it was concluded that the cause of uterine inertia was at least not related to serum Magnesium levels in the present investigation.

Although the blood glucose