



## Pre and Post-operative Haemato-Biochemical Changes in Pyometric Bitches

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### ABSTRACT

The study on canine pyometra was conducted to assess the alteration in clinico-haemato-biochemical status before and after ovariohysterectomy. Signalment and history recording of six bitches was followed by clinical examination, ultrasonography and blood sampling. Most common clinical signs were vulvar discharge, inappetance, polydipsia, polyuria, vomiting and paresis. At presentation, uterine diameters ranged from 1.3 to 5.0 cm along with leukocytosis, neutrophilia and lymphopenia. Levels of BUN, creatinine, and ALP were elevated. Five out of six bitches had plasma P<sub>4</sub> concentration above basal (> 1.0 ng/ml) level. The mean haemato-biochemical parameters returned to normal by day ten post-surgery. The progesterone concentration decreased to basal by 10<sup>th</sup> day. The changes in haemato-biochemical profile were related to the degree of improvement of the clinical conditions of the bitches. Out of the six bitches, one bitch died on 21<sup>st</sup> post-operative day while another recovered gradually after initial episodes of severe vomiting for a week post-operation.

**Keywords:** Pyometra, Bitch, Ovariohysterectomy, haemato-biochemical changes

Canine pyometra is a diestral disease typical of adult intact bitches whose development is strongly influenced by sequential progestational stimulations (normal diestrus or treatment with progestins) of the uterus. It is a reproductive disorder which affects nearly one-fourth of female dogs before they reach 10 years of age (Egenvall *et al.*, 2001). Pyometra, by definition, is the accumulation of purulent material within the uterine lumen of intact bitches, typically occurring during or immediately following a period of progesterone dominance. It typically affects mature bitches that have undergone repeated estrous cycling, with a reported mean age of 7.25 years (Johnston *et al.*, 2001). There appears to be an increased incidence of pyometra in nulliparous bitches and gestation has a protective action on the canine endometrium (Chastain *et al.*, 1999). Conventionally the treatment of choice for any older, systematically ill or closed cervix pyometra is ovariohysterectomy (MacIntire, 2004).

### MATERIALS AND METHODS

Six clinical cases of different breeds in the age group of six to twelve years brought for treatment to the Teaching Veterinary Clinical Complex, F.V.Sc & A.H., SKUAST-Jammu with clinical symptoms indicative of the open type or close type of pyometra were taken for the study. The pyometra was further confirmed using diagnostic methods like abdominal palpation and ultrasound examination.

Critically ill bitches were stabilized prior to surgery by administration of intravenous fluids and broad spectrum antibiotics. Ovariohysterectomy was performed according to generally accepted surgical guidelines. Special care was taken to invert the uterine stump edges to avoid contamination. Enrofloxacin @ 5 mg/kg body weight, s.i.d. for 5-7 days + Amoxicillin-dicloxacillin or Amoxicillin-clavulanic acid @ 14 mg/kg body weight bid, for 7-30 days was administered. Antiseptic dressing of the surgical



wound was done after every two days and skin sutures were removed on the 10<sup>th</sup> post-operative day. Blood sampling was done twice, 1<sup>st</sup> on the day of presentation and 2<sup>nd</sup> at day 10 when the bitch was presented for opening of skin sutures. Apart from 1 ml blood sample, the rest was centrifuged at 2500 rpm for 10 minutes and plasma separated and stored in labeled plastic vials at -20°C until assay at the Department of Veterinary Gynaecology and Obstetrics GADVASU, Ludhiana, Punjab.

The data obtained was subjected to statistical analysis by paired t-test at 5 per cent level of significance with the help of Statistical Package for Social Sciences (SPSS 16.0) software.

## RESULTS AND DISCUSSION

### Haematological Alterations

Results of haemato-biochemical alterations are presented in Table 1. At presentation, leukocytosis, neutrophilia and lymphopenia was found in most of the pyometric bitches. These findings are consistent with the earlier studies (Singh *et al.*, 2010; Sahoo *et al.*, 2012). After the ovariohysterectomy there was significant ( $p < 0.05$ ) decrease in TLC and neutrophils towards normalcy in all the bitches as supported with previous observations (Patil *et al.*, 2013; Gupta *et al.*, 2013). A mild monocytosis was also evident in some bitches during presentation in the present study. Monocytosis in cases of pyometra has been reported as an indicator of the chronicity of an infectious process, associated with abscessation (De Schepper *et al.*, 1987). The lymphopenia was observed among the bitches affected with pyometra at day 1 which increases significantly ( $p < 0.05$ ) towards normal values post-operatively as compare to day one and the same change was reported by the previous study of Jena *et al.* (2013).

### Biochemical Alterations

The mean blood urea nitrogen (BUN) and creatinine levels were higher on the day of presentation in all the pyometric bitches in the present study which is comparable with the earlier findings of Dabhi and Dhama (2006) and Sahoo *et al.* (2012). At day 10 post-operative, there was a significant ( $p < 0.05$ ) decrease in the mean plasma concentrations of both BUN and creatinine in all the bitches under study. The

post operative decline in the mean plasma concentrations of both BUN and creatinine in all the bitches under present study suggest reversal of toxemia within 10 days and this observation is supported by the findings of Borresen (1980) and Gayakwad *et al.* (1999).

At presentation, the plasma AST and ALT levels were elevated in all six pyometric bitches. Post-operatively, the mean value of AST decreased significantly ( $p < 0.05$ ) while the decrease in ALT was non-significant ( $p > 0.05$ ) at day 10 as compared to the pre-operative values. Similar findings were reported by De Schepper *et al.* (1987). Hagman (2004) stated that serum ALT values were within normal range even in pyometric bitches, while De Schepper *et al.* (1987) and Dabhi *et al.* (2007) observed increased levels of serum AST due to inhibition of liver enzyme synthesis or hepatic membrane damage.

**Table 1:** Pre-and post-operative haemato-biochemical (Mean±SE) parameters of pyometric bitches (n=6)

Sl. No.	Parameters	D <sub>1</sub>	D <sub>10</sub>
1	BUN(g/dl)	53.47±1.89 <sup>a</sup>	25.39±1.71 <sup>b</sup>
2	Creatinine (mg/dl)	3.02±0.21 <sup>a</sup>	1.11±0.14 <sup>b</sup>
3	AST (IU/L)	51.61± 3.66 <sup>a</sup>	32.76±1.85 <sup>b</sup>
4	ALT (IU/L)	52.65± 4.06	49.46±2.67
5	ALP (IU/L)	108.02±8.86 <sup>a</sup>	75.63±8.49 <sup>b</sup>
6	Progesterone(ng/ml)	2.72 ± 0.58 <sup>a</sup>	1.04 ± 0.54 <sup>b</sup>
7	TLC(10 <sup>3</sup> /mm <sup>3</sup> )	29.06 ± 0.87 <sup>a</sup>	11.55 ± 0.61 <sup>b</sup>
8	Differential leukocyte count (%)		
	Neutrophil (%)	78.00 ± 0.44 <sup>a</sup>	68.33 ± 0.66 <sup>b</sup>
	Lymphocyte (%)	11.16± 0.49 <sup>a</sup>	23.66±0.68 <sup>b</sup>
	Monocyte (%)	8.83± 0.58 <sup>a</sup>	6.66 ± 0.25 <sup>b</sup>
	Eosinophil (%)	2.16± 0.20	1.33± 0.25

Different superscripts (a and b) indicate significant difference ( $p < 0.05$ ) within a row.

The ALP concentration was elevated in all bitches at presentation. Similar findings had been reported by Dabhi *et al.* (2007) and Sahoo *et al.* (2012). There was significant ( $p < 0.05$ ) decline in the plasma ALP activity after ovariohysterectomy. Dabhi *et al.* (2007) reported similar findings in cases of pyometra after surgical treatment.

The mean level of plasma progesterone was above basal level at the day of presentation in all the bitches. Mean plasma progesterone levels declined significantly ( $p < 0.05$ )

at 10th day post-operative similar to the previous findings of Dabhi *et al.* (2007) and Gao *et al.* (2011).

Out of the six bitches, one bitch died on 21<sup>st</sup> post-operative day while another recovered gradually after initial episodes of severe vomiting for a week post-operation. Other four bitches recovered without complications post-operatively. Post surgical mortality in pyometric bitches has been found to be approximately 5 per cent or more (Wheaton *et al.*, 1989). The study concluded that there was reversal of toxemia and normalization of haemato-biochemical profiles in bitches that recovered from pyometra after ovariohysterectomy.

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