



Physiological and Hematobiochemical changes in open and closed pyometra in female dogs

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Abstract

The present study was conducted to evaluate the changes in physiological and Hematobiochemical changes in open and closed pyometra. Pyometra affected dogs were broadly divided into open and closed pyometra depending on the patency of cervix. clinically healthy dogs served as control. Physiological parameters did not show any significant difference. Normocytic normochromic anemia was evident in both pyometra affected groups when compared to control dogs. TLC and neutrophil count was significantly higher in pyometra affected group. Lymphopenia and eosinopenia was evident in open and closed pyometra. A slight monocytosis was observed in closed pyometra. Band neutrophil was significantly higher in affected groups when compared to control dogs. Hepatic enzymes ALT did not show any significant changes, while AST was significantly increased in closed pyometra. Hyperglobulinemia with hypoalbuminemia with unaltered total protein concentration was consistent with open and closed pyometra. The creatinine concentrations were significantly higher in open and closed pyometra when compared to healthy control dogs.

Keywords: pyometra, open, closed, hemato biochemical, anemia, creatinine

I. INTRODUCTION

Pyometra 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 is a disease of intact and mature bitches that is of particular importance to veterinary practitioner, because early recognition, diagnosis and appropriate intervention are required to avoid disastrous consequences (Pretzer, 2008). Canine pyometra is a life-threatening disease common in countries where spaying of dogs is not routinely performed. The disease is associated with endotoxaemia, sepsis, systemic inflammatory response syndrome with a mortality rate of 3-4 per cent in dogs (Brady *et al.*, 2001; Egenvallet *et al.*, 2001; Hagman *et al.*, 2006). Common clinical signs of pyometra include local sign of vaginal discharge and systemic signs such as vomiting, inappetence, polyuria / polydipsia and lethargy. Pyometra is classified into two types open-cervix and closed-cervix pyometra. Open-cervix pyometra is characterized by bacterial uterine infection with dilation of cervix. The dilated cervix provides a route for drainage of the purulent exudates from the uterus. Closed-cervix pyometra occurs when the cervix is completely closed and the infection is contained within the uterus with no route for evacuation, which effectively creates an internal abscess within the abdominal cavity with fatal sequelae (Patil *et al.*, 2013).

II. Materials and methods

The present study was carried out in department of veterinary gynaecology and obstetrics, veterinary college, Hebbal, Bangalore. A tentative diagnosis of pyometra was made in female dogs on the basis of medical history, physical examination with particular reference to the presence of purulent/mucopurulent vaginal discharge. Animals exhibiting abnormal vaginal discharge were considered as suspected case of open pyometra and were further examined by transabdominal ultrasonography for confirmation of pyometra. In animals where the clinical signs were suggestive of pyometra but did not exhibit any vaginal discharge were tentatively diagnosed as closed pyometra. These animals were further subjected to transabdominal ultrasonography for confirmation of the case as closed pyometra.

The ultrasound diagnosis of pyometra was arrived when there was an enlarged convoluted uterus filled with anechoic or hypo-echoic contents. The luminal contents were usually homogenous, but the contents may also be echo-dense with slow and swirling patterns.

The Six clinically normal healthy dogs with the history of estrus minimum a month back, served as control (Group I). The open (Group II) and closed (Group III) pyometra groups consisted 18 dogs each.

Differences in physiological and hemato biochemical parameters were analyzed by ANOVA followed by Tukey's test. The statistical package of graph pad prism, San Diego, USA was considered for analyzing the data. Difference between the mean values was significant when P values were less than 0.05.

III. Results and Discussion

The values obtained in the present study are tabulated in table 1. The physiological parameters temperature, heart rate, and respiration rate did not vary significantly in control, open and closed pyometra which is in agreement with findings of Fransson, (2003), Sharif *et al.*, (2013), Karlsson *et al.*, (2013) and Hagman (2004). The haematological parameters like haemoglobin, PCV, neutrophil, lymphocyte, eosinophil, and band cell did not vary significantly ($P < 0.05$) between open and closed type of pyometra however, the values differed significantly when compared with healthy control dogs. Monocyte and basophil did not reveal any differences in healthy and affected groups. The total leucocyte count were significantly higher ($P > 0.05$) in closed pyometra when compared to open pyometra affected dogs. However, the TLC values in both affected groups varied significantly when compared to control healthy animals. The leucocytosis in the present study are in acceptance with Kochhar *et al.* (1996), Bortaskova *et al.* (2007), England *et al.* (2007) and Kashinath *et al.* (2009).

The significantly higher levels of AST were recorded in open and closed pyometra when compared to control whereas ALT levels did not vary among the groups. Hyper globulenemia with hypo albuminemia was evident in affected groups, with high levels of globulin seen in closed pyometra compared to control. The total protein levels were unaffected in all the groups. The renal function indicator creatinine was significantly higher in closed pyometra dogs, but no significant difference with open pyometra dogs. The creatinine levels were significantly higher in affected groups when compared to control healthy dogs. The Hematobiochemical values obtained in the present study corroborates with Renukaradhya (2011), Radwinska *al.* (2012), Yu (2012) and Jitpean *et al.* (2014)

Table: 1Physiological and hematobiochemical changes in open and closed pyometra

PARAMETER	CONTROL	OPEN PYOMETRA	CLOSED PYOMETRA
TEMPERATURE	102.20±0.21 ^a	102.40±0.23 ^a	102.20±0.19 ^a
HEART RATE	115.00±10.25 ^a	117.10±6.99 ^a	105.10±3.24 ^a
RESPIRATION RATE	30.50±2.50 ^a	26.28±1.21 ^a	29.22±1.40 ^a
HAEMOGLOBIN	14.87±2.50 ^a	12.32±0.75 ^b	11.66±0.49 ^b
PCV	46.58±4.22 ^a	35.95±1.99 ^b	36.50±1.51 ^b
TLC	12632.00±2446.00 ^a	29215.00±3466.00 ^b	36896.00±4295.00 ^c
NEUTROPHIL	70.03±4.05 ^a	84.00±2.43 ^b	85.78±2.30 ^b
LYMPOCYTE	25.90±1.98 ^a	11.28±2.15 ^b	10.33±1.93 ^b
MONOCYTE	1.28±0.72 ^a	1.16±0.35 ^a	2.05±0.76 ^a
EOSINOPHIL	2.45±1.62 ^a	1.82±0.32 ^b	2.05±0.76 ^b
BASOPHIL	0.43±0.30 ^a	0.17±0.09 ^a	0.11±0.08 ^a
BAND CELL	0.00±0.00 ^a	1.94±0.73 ^b	1.39±0.56 ^b
ALT	31.17±3.38 ^a	32.67±4.58 ^a	26.94±2.93 ^a
AST	23.17±1.70 ^a	43.39±5.53 ^b	37.56±3.58 ^b
TOTAL PROTEIN	6.77±0.17 ^a	7.22±0.22 ^a	7.99±0.22 ^a
ALBUMIN	3.00±0.22 ^a	2.29±0.14 ^b	2.23±0.08 ^b
GLOBULIN	3.77±0.36 ^a	4.94±0.32 ^b	5.72±0.23 ^c
CREATININE	0.93±0.09 ^a	1.40±0.23 ^b	1.81±0.26 ^b

Note: means bearing common superscript in row did not vary significantly(P<0.05)

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