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Biochemical Alterations in Canine Pyometra

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ABSTRACT

Nine pyometra-affected bitches were utilized for the study of alterations in biochemical profiles. The biochemical profiles studied were creatinine, BUN, total bilirubin, conjugated bilirubin, SGPT, SGOT, ALP, total protein, albumin, globulin, GGT and A/G ratio. All the profiles were within normal range except in total protein fractions, total bilirubin and ALP activity. Hyperglobulinemia, hypoalbuminemia, hyperprotinemia with increased ALP activity was recorded in pyometra-affected bitches.

Key words: *Bitches - Pyometra - Biochemical Profiles.*

INTRODUCTION

Pyometra in bitches is relatively a common reproductive disorder in middle-aged bitches of all breeds. It commonly occurs during diestrus resulting from a complex interrelationship between follicular estrogen and luteal progesterone and secondarily by microorganisms. The infection begins as cystic hyperplasia of endometrial glands. Thus, the secretion of the glands provide favourable environment for bacteria that entered the uterus as ascending infection. The bacterial isolates include *E.coli, Klebisella, Pasturella, Enterobacter, Staphylococcus, Streptococcus etc.* Hence, the condition makes the uterus unable to contract, with the result the bacterial count could not be cleared effectively from genital tract. The effected bitches showed clinical signs like depression, polydipsia, polyuria, purulent to sero-sangvinous vaginal discharges, vomitions and diarrhoea. It is also associated with endotoxemia, sepsis, systemic inflammatory response syndrome with mortality rate of 3-4 %. Hence, the present paper is aimed to record the alterations in biochemical profiles of plasma related to kidney and liver functions during pyometra.

MATERIALS AND METHODS

Nine bitches with open pyometra of different breeds aged from (3-10) years were clinically examined and diagnosed as pyometra by clinical history , clinical signs and ultrasonography. The blood sample was collected into BD vacutainer from cephalic vein using 20-gauge needle with all aseptic precautions. The blood samples were analyzed at private labs for creatinine, BUN, SGPT, SGOT, ALP, total protein, globulin, bilirubin and GGT.

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RESULT AND DISCUSSION

The results are as follows

Biochemical profiles of plasma in pyometra affected bitches

Parameter	Values	Normal range*
Creatinine	0.92 ± 0.10 mg/dl	0.5 - 1.6
BUN	13.57 ± 2.87 mg/dl	7.0-26
Total bilirubin	**0.51 ± 0.17 mg /dl**	**0.0-0.4**
Conjugated bilirubin	0.17 ± 0.02 mg /dl	0.0 -0.4
SGPT	33.78 ± 19.16 IU/L	10-109
SGOT	**44.11 ± 6.99 IU/L**	**13-15**
ALP	**182.89 ± 69 IU/L**	**10 -150**
Total protein	**7.92 ± 0.38 g/dl**	**5 .4-7.5**
Albumin	**2.42 ± 0.37 g/dl**	**2.6 - 4.0**
Globulin	**4.86 ± 0.68 g/dl**	**2.1-3.7**
GGT	2.09 ± 0.27 IU/L	1.0-9.7
A/G ratio	0.6 ±0.26	0.8-2.0

**Source: Merck veterinary manual online edition.*

The mean creatinine (0.92 ±0.10) levels and BUN (13.57±2.87) levels were in normal range but there was significant increase in total protein (7.92±0.38) and ALP (182.89 ± 69). Besides this, the albumin level (2.42 ± 0.37) was decreased and globulin level (4.86 ± 0.68) was markedly increased along with slight increase in total bilirubin (0.51 ± 0.17 mg /dl) level**.**

Hyperprotenemia in these cases might be due to acute phase reaction in pyometric bitches[4,11]. But the hyperglobulinemia concurrent with hypoalbuminemia might be due to mild to moderate urinary protein loss especially albumin[9,12,10]. The elevated ALP and total bilirubin values might be due to hepatocellular damage in these cases[7].

The hyperglobulinemia and hyperprotinemia can also occur due to chronic inflammation and dehydration. These alterations in fraction of protein could be due to loss of albumin via mildly damaged kidneys and elevated globulin could be a defense mechanism against infection[5].

Creatinine and BUN values indicated early renal insufficiency. Nevertheless, the levels were within normal range in these cases. However, the levels of more than 20 mg/dl indicate mild or early kidney disease. Likewise, 80 mg/dl of BUN levels indicates uremic conditions.

The specific liver enzyme like SGPT levels are markedly increased only during the infection, injury and interrupted blood supply. The enzyme SGOT levels may be used as marker for cardiovascular disorder and the enzyme GGT levels are increased when there is obstruction to bile duct.

Possible explanations for observed increase in all these parameters include hepatocellular damage might be caused by septicemia, changes in hepatic circulation and cellular hypoxia in dehydrated bitches, as well as intrahepatic cholestasis[2,13,8,3].

In the bitches of present study, there are no much alterations in profiles of kidney function and liver function, except protein fractions and bilirubin levels. Hence, further studies are warranted for estimation of loss of micro albumin in urine as well as glomerular filtration rate to prevent further kidney damage.

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