

**HAEMATOLOGICAL CHANGES IN OPEN CERVIX PYOMETRA
FOLLOWING PGF₂α THERAPY IN CANINES**

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ABSTRACT

Canine pyometra is a common reproductive disorder of intact diestrual bitch, which warrants early recognition, diagnosis and appropriate treatment to avoid any disastrous consequences. A total of 36 bitches of different breeds and age were divided into three groups consisting of twelve bitches in each group. Animals of Group I were treated with PGF₂α @ 250 µg/kg body weight once daily for five days, and those of Group II were treated with PGF₂α @ 30 µg/kg body weight twice daily for eight days subcutaneously. Both the above groups including Group III (non-PGF₂α control) were treated with selected antibiotics (Cefataxime, Amikacin etc) parenterally for seven days based on antibiogram results at standard dosage. The effect of PGF₂α treatment on haematological changes in open type of pyometra revealed no changes in total erythrocyte count, haemoglobin and packed cell volume, while there was marked neutrophilic leucocytosis, monocytosis and shift to left (immature neutrophils).

KEY WORDS: Open cervix pyometra, PGF₂α, bitches, haematology.

INTRODUCTION

Pyometra is a hormonally mediated acute or chronic polysystemic diestrual disorder and induces high mortality in bitches if not treated in time (Singh *et al.*, 2010). Physiological, haematological and biochemical changes in pyometra are considered significant to assess the severity of the disease condition (Singh *et al.*, 2006). Restoration of fertility may be done with medical treatment (Baithalu *et al.*, 2010). PGF₂α induced increased myometrial contractions might enhance cervical relaxation and has a luteolytic effect (Gobello *et al.*, 2008). The pyometra is one of the life-threatening reproductive disorders in bitches and the clinical manifestations are attributed to haemato-biochemical alterations in pyometric bitches resulting in toxemia and toxic bone marrow depression. The aim of this study was to study treatment response to different doses of PGF₂α treatment and to compare haematological profile of pyometric bitches in different treatment groups.

MATERIALS AND METHODS

Thirty six bitches of different breeds aged between one to ten years, brought to the small animal obstetrics and gynaecology unit, Madras Veterinary College Hospital with open type pyometra were included for experimental study. The confirmative diagnosis of pyometra was arrived based on clinical signs, abdominal palpation, radiography and ultrasonography. These bitches were divided into three equal groups consisting of twelve bitches in each group (Group I, II and III). Bitches in Group I were treated with PGF₂α (Inj. Lutalyse – Up John Co.) at the dose rate of 250 µg/kg body weight once daily for five days subcutaneously along with selected antibiotics based on antibiogram of genital discharge. Bitches in Group II were treated with PGF₂α at the dose rate of 30 µg/ kg body weight twice daily for eight days subcutaneously along with selected antibiotics based on antibiogram. Bitches in Group III were treated with selected antibiotics alone based on antibiogram parenterally for seven days.

Blood samples were collected from all the bitches by cephalic vein puncture in a 5 ml vial containing EDTA as an anticoagulant before and at the end of treatment in the respective groups. The blood samples were subjected to estimation of hemoglobin (Hb), packed cell volume (PCV), total erythrocyte count (TEC), total leukocyte count (TLC) and differential leucocyte count (DLC). Statistical analysis of the data was carried out as per the standard procedure outlined by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Total erythrocyte count:

The mean total erythrocyte count before treatment was 4.63 ± 0.23 , 4.56 ± 0.18 and 4.70 ± 0.20 million/cmm in group I, II and III, respectively. In 19 per cent of bitches the total erythrocyte count was found to be lower than the normal and ranged from 3.2 to 4.7 million/cmm. The normocytic regenerative type of anaemia may be either due to diapedesis in the uterine lumen with erythrocytic loss in to the pus or shortened life span of erythrocytes caused by toxic effects due to toxic depression of bone marrow. The mean total erythrocyte count showed a slight increase at the end of treatment to 4.75 ± 0.25 , 4.60 ± 0.20 and 4.85 ± 0.26 million/cmm in group I, II and III, respectively. The total erythrocyte counts showed a rising trend at the end of treatment in all three groups which suggested a clinical recovery of animals in response to treatment. This is in agreement with Thirumurugan (2011), who observed increased erythrocyte count in response to the treatment.

The mean total erythrocyte count (million/cmm) in recovered and non-resilient non-responded bitches were 5.18 ± 1.12 and 3.70 ± 0.20 in group I, 4.79 ± 0.17 and 4.10 ± 0.00 in group II, 4.85 ± 0.05 and 5.17 ± 0.20 in group III, respectively. Statistical analysis revealed a significant increase ($P < 0.01$) in total erythrocyte count in recovered bitches in group I, while in not responded bitches the count declined significantly to 3.70 ± 0.20 .

Haemoglobin (Hb)

The mean Hb levels in bitches with pyometra before treatment were 9.20 ± 0.50 , 9.04 ± 0.46 and 8.83 ± 0.51 g/dl in group I, II and III, respectively. Eight out of 36 bitches showed abnormally low Hb values ranging from 5.5 to 7.5 g/dl. The mean Hb values at the end of treatment showed a slight increase to 9.33 ± 0.50 , 9.34 ± 0.43 and 9.08 ± 0.47 g/dl in group I, II and III, respectively. However no significant difference in the Hb levels was observed at the end of treatment in any of the three groups. A slight increase in the mean haemoglobin values at the end of treatment period in group I, II and III indicated a response to treatment (Thirumurugan, 2011).

The mean Hb levels in recovered and not-resilient bitches were 10.11 ± 0.49 and 7.50 ± 0.00 g/dl in group I, 9.70 ± 0.42 and 7.00 ± 0.00 g/dl in group II and 8.75 ± 0.59 and 9.57 ± 0.30 g/dl in group III, respectively. Analysis of variance revealed non-significant differences between recovered and not resilient bitches in all three groups.

Packed cell volume (PCV):

Normal haematocrit values (PCV > 37%) were observed in 41 per cent of bitches. This was in agreement with Coles (1986), who observed normal haematocrit values in 37-54 per cent, whereas 59 per cent of bitches were found to be markedly anaemic. The present finding was also in agreement with Sevelius *et al.* (1990).

The mean packed cell volume at the end of treatment was found to be 31.56 ± 1.63 , 31.00 ± 1.60 and 29.16 ± 1.49 per cent in group I, II and III, respectively. Statistically there was no significant difference in the PCV before and at the end of treatment. Also no significant difference in the PCV was observed at the end of treatment between groups. The mean PCV in responded and not responded bitches were 32.89 ± 1.09 and 29.00 ± 3.00 per cent in group I, 32.80 ± 1.31 and 24.00 ± 0.00

per cent in group II and 30.00 ± 0.59 and 31.57 ± 1.54 per cent in group III, respectively. Analysis of variance revealed no significant difference in PCV from pre-treatment values in both recovered and not resilient bitches of all three groups (Thirumurugan, 2011).

Total leukocyte count (TLC)

The mean pre-treatment levels of TLC were found to be 24.05 ± 2.66 , 20.45 ± 2.59 and 20.40 ± 2.81 per cmm in group I, II and III, respectively. Twenty two out of 36 bitches showed leukocytes ranging from 18,400 to 38,000 per cmm, while 14 bitches showed normal TLC. This is in agreement with Sevelius *et al.* (1990), who stated that exudates from an open cervix may reduce the chemotactic effect on neutrophils and consequently total leukocyte count in peripheral blood may remain within normal range. They also reported normal leukocyte count along with increased leucocytes in bitches with open type pyometra. At the end of treatment the mean values of total leukocyte count declined to 19.91 ± 2.16 , 17.25 ± 2.36 and 17.36 ± 2.66 per cmm in group I, II and III, respectively. Nelson and Feldman (1986) opined that during recovery, leucocytes gradually subside although days or weeks are required for a return to normal. Although a decline in total leukocyte was observed following treatment in all the groups, statistically no significant difference was noticed before and at the end of treatment within the group.

The mean total leukocyte counts in responded and non-resilient bitches were 19.99 ± 2.96 and 14.9 ± 1.60 per cmm in group I, 17.15 ± 2.63 and 10.30 ± 0.00 per mm^3 in group II 23.00 ± 3.01 and 16.88 ± 2.80 per cmm in group III, respectively before and after treatment. Analysis of variance revealed non-significant difference from pre-treatment values in both recovered and not resilient bitches of all three groups.

Differential leukocyte count (DLC):

The mean pre-treatment values of neutrophil were 69.17 ± 1.66 , 73.75 ± 1.58 and 76.17 ± 3.50 per cent in group I, II and III, respectively. The mean neutrophil count at the end of treatment declined in group I, II and III, respectively. Although slight decrease in neutrophil count was observed at the end of treatment compared to pre treatment values there was no significant difference in the neutrophil count before and at the end treatment in all the three treatment groups and also between the groups at the end of treatment.

The mean pre-treatment lymphocyte counts were 9.83 ± 0.95 , 10.08 ± 1.13 and 12.66 ± 0.52 per cent, while the corresponding mean lymphocyte counts at the end of treatment were found to be 11.00 ± 0.98 , 11.58 ± 1.23 and 13.16 ± 0.44 per cent in group I, II and III, respectively. Although slight increase in the mean post-treatment lymphocyte count was observed compared to pre-treatment values, statistically there was no significant difference.

CONCLUSION

It was concluded that total erythrocyte count, haemoglobin, packed cell volume, total leukocyte count and differential leukocyte count are of indicative value in prognosis and in pre- and post-treatment assessment of canine pyometra.

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REFERENCES :

Baithalu, R.K., Maharana, B.R., Misra, V., Sarangi, L. and Samal, L. (2010). Veterinary World, 3(7): 340-342.

Coles, E.H. (1986). *Veterinary Clinical Pathology*. 4th Edn. W.B. Saunders Company, Philadelphia, London, p. 77-78.

Gobello, C., Castex, G., Klima, L., Rodriguez, R. and Corrada, Y. (2008). *Theriogenology*, 60: 901-908.

Nelson, R.W. and Feldman, E.C. (1986). *Pyometra*. *Vet. Clin. North Am.*, **16**:561-576.

Sevelius, E., Tidholm, A. and Tolling, K.T. (1990). *J. Am. Vet Med. Assoc.*, **26**: 33-38.

Singh S., Dadhich, H. and Sharma, G.D. (2006). *Indian J. Vet. Path.*, 30: 66-64.

Singh. K.P., Singh, B., Singh, J.P., Singh, S.V., Singh, P. and Singh, H.N. (2010). *Intas Polivet*, 11: 86-87.

Snedecor, G.W. and Cochran, W.G. (1994). *Statistical Methods*. Oxford and IBH Publishing Co., New Delhi, India, p. 229.

Thirumurugan, K. (2011). *Efficacy of Aglepristone and Prostaglandin F₂α in treatment of open cervix pyometra in bitches*. M.V.Sc Thesis, TANUVAS, Chennai, India.

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