

## Haemato-Biochemical, Ultrasonographical and Histopathological Changes of Prostatic Enlargement in Dogs

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### Introduction

Bacterial urinary tract infection usually results from ascending infection from normal skin and gastrointestinal tract flora which may overcome the normal urinary tract defences that prevent colonization. In intact male dogs, UTI frequently extends to the prostate gland. Due to the blood prostate barrier, it is difficult to eradicate bacteria from the prostate gland. They may reinfect the urinary tract, causing a systemic bacteremia, infect the reproductive tract, or cause a local infection within the prostate and eventually cause an abscess (Dowling, 1996). The present paper describes the haemato-biochemical changes, ultrasonographical changes and urinalysis findings of the 4 dogs with prostatic enlargement.

### Materials and Methods

The study was conducted in the department of Clinical Veterinary Medicine, College of Veterinary and Animal Sciences, Mannuthy. Dogs brought to the University Veterinary Hospital, Kokkalai and Mannuthy with clinical signs suggestive of urinary tract infections were selected and utilized for the present study. Urine was collected by ante pubic cystocentesis on the day of admission and 10th day before discontinuing the treatment, into 50 ml sterile urical vials and kept under refrigeration until further analysis. Antibiotic sensitivity of the urine samples was obtained by using disk-diffusion (Kirby-Bauer method) method as per Cruickshank (1975) and Quantitative urine culture of bacteria was expressed as CFU/ml (Gatoria, 2006). Total erythrocyte count, hemoglobin, volume of packed red cells, total leukocyte count, differential leukocyte count, platelet count, Creatinine, albumin were estimated as per the standard techniques. Serum C-reactive protein (CRP) was estimated using the turbidimetric assay using standard kits.

From which 4 dogs showing depression, pain on rectal palpation of the prostate, fever, straining to urinate or defecate subjected to the estimation of the prostatic volume ultrasonographically in cubic centimeters from greatest cranio-caudal (L), transverse view (W) and dorsoventral (D) diameters using the formula : volume in cubic centimeters =  $( [ L \times W \times D ] / 2.6 ) + 1.8$ .

### Results and Discussion

Depression, pain on rectal palpation of the prostate, fever, straining to urinate or defecate seen in the present study were similar to the observations made by Johnson *et al.* (2000) in acute prostatitis. Total erythrocyte count ( $6.2 \pm 1.89$  million / cumm), hemoglobin ( $12.89 \pm 3.36$  gms %), volume of packed red cells ( $39.38 \pm 10.53$  %), total leukocyte count ( $23.2 \pm 11.33 \times 10^3 / \mu\text{l}$ ), neutrophils ( $79 \pm 12.17\%$ ), lymphocytes ( $19.33 \pm 12.23\%$ ), eosinophils ( $1.33 \pm 1.16\%$ ) platelet count ( $2.69 \pm 1.10 \times 10^6 / \mu\text{l}$ ), creatinine ( $6.96 \pm 0.19$  mg/dl), albumin ( $2.41 \pm 0.86$  %), and serum CRP ( $12.4 \pm 0.67$  mg/dl) were observed.

Leucocytosis with neutrophilia and left shift were present in renal and prostatic diseases. Raila *et al.* (2011) suggested that serum CRP measurement might contribute to the detection, prognosis and/or monitoring of the disease in dogs and highest CRP values were observed in dogs with uremia and proteinuria. This was in agreement with prostatitis in the present study.

Ultrasonographic examination revealed diffuse increase in echogenicity of prostatic parenchyma.

The mean prostatic length, depth, width and volume in the present study were 4.98 cm, 4.67 cm and 4.45 cm and 44.21 cm<sup>3</sup> respectively. The prostatic fluid volume was calculated.

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Estimated prostatic volumes were ranged from 18.46 cm<sup>3</sup> to 64.99 cm<sup>3</sup> with the mean value of 44.21 cm<sup>3</sup> (Plate.1).



**Plate.1: Diffuse increase in echogenicity of dogs Prostatic parenchyma**

Kidney cortex was thick, hyperechoic and renal pelvis was hyperechoic in dog with prostatic enlargement.

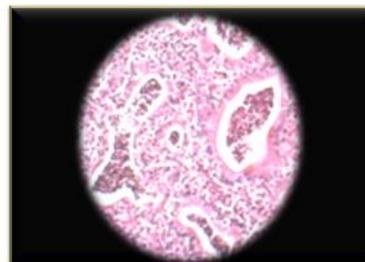
One dog of acute prostatitis in the present study was succumbed which was yielded prostatic volume of 64.99 cm<sup>3</sup> with multifocal hyperechoic areas. Postmortem examination of succumbed animal was conducted. Both kidneys were small, haemorrhagic and irregular in shape. Bladder was distended with urine and bladder wall was thickened. Enlarged prostate obstructing the flow of urine was detected. The weight of the prostate was 50g (Plate.2).



**Plate.2. Postmortem examination of with acute prostatitis**

Both the lobes of prostate were enlarged and filled with pus, which was in correlation with ultrasonographic findings. The echymotic patches in bladder mucosa were suggestive of cystitis, which could be correlated with culture of urine.

Histopathology of prostate gland revealed infiltration by neutrophils in acinar and stromal tissue (plate.3).



**Plate.3. Histopathology of prostate (H &E-10x) acini filled with neutrophils**

Bladder inflammation was characterized by combination of mostly plasma cells with lymphocytes and neutrophils and the inflammation extended into muscular layer of bladder.

### Summary

The present study was undertaken to evaluate haemato-biochemical and ultrasonographical changes of the dogs affected with prostatitis. Ultrasonography is an effective non invasive diagnostic tool for early diagnosis of urinary tract infections (UTI). Whether clinical signs are present or not, the consequences of untreated UTI included urolithiasis, prostatitis, septicemia and pyelonephritis with scarring and eventually kidney failure. Bacterial infections of the urogenital system were among the most frequently encountered infections in small animal medicine and varied from asymptomatic to life threatening.

### References

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