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Short Communication

Blood urea nitrogen and creatinine as prognostic indices in canine pyometra

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ABSTRACT

Blood urea nitrogen (BUN) and creatinine were estimated in 20 bitches suffering from pyometra. Azotemia (BUN > 30 mg/dl and/or plasma creatinine > 2 mg/dl) was recorded in 10 (50%) patients. The bitches were treated with medicines and/ or surgically for pyometra and their responses were studied. Death/complications occurred in 40 % of the azotemic bitches. The bitches suffering from pyometra with initial plasma BUN and creatinine levels of more than 120 mg/dl and 5 mg/dl, respectively, had a poor prognosis.

Key words: Blood urea nitrogen, creatinine, pyometra

Pyometra in bitches is a diestral disorder associated with a combination of progestational, estrogenic and bacterial factors leading to endometritis and toxaemia. The toxic state affects the function of several organs like bone marrow, kidney and liver (Hardy and Osborne, 1974). Many authors have reported that the biochemical and renal profiles are influenced by pyometra (Renton *et al.*, 1971; Borresen 1980, Stone *et al.*, 1988; Gayakawad *et al.*, 1999). Gyula *et al.* (1985) found 48% of pyometra affected animals to be azotemic, and 38% of the azotemic dogs died. Renton *et al.* (1971) encountered 30% azotemia and 33% of the azotemic dogs died after ovariohysterectomy. This paper presents blood urea nitrogen (BUN) and creatinine levels as a guide for prognosis of pyometric bitches.

The study was carried out on 20 bitches ailing from pyometra. Blood samples (5 ml) were collected from the bitches by cephalic or sephanous venupuncture in heparinised syringe at the time of presentation for treatment to the university veterinary clinics. Blood was centrifuged at 3000 rpm for 10 minutes. Plasma was harvested and stored frozen (- 20° C) for biochemical analysis.

BUN estimation was done by UV method and creatinine was estimated from plasma by picrate method using Autopack reagent kits (Bayer Diagnostics India Ltd., Baroda). Treatment was given as per the clinical condition of the case. One moribund, quadriplegic patient was euthanized at owner's request on the day of presentation. One critically ill bitch was directly subjected to ovariohysterectomy and another didn't turn back subsequently. The remaining 17 cases were treated with broad-spectrum antibiotics along with one of the following three treatments:

a) Methylergometrine maleate (Tab. Metherginé) – 1 bid orally for 3-5 days (n = 3)

b) $PGF_2\alpha$ (Inj. Lutalyse) sc @ 0.1 mg/kg bid for 5-7 days (n = 8).

c) $PGF_2\alpha$ intravaginally @ 0.15 mg/kg od for 5-7 days (n = 6).

The cases not responding to medical treatment

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Table 1. BUN levels and response obtained in pyometric bitches (n = 20).

BUN (mg/dl)	No. of animals	Response
< 30	10	8 Recovered
		1 Died after 6 day of treatment and ovario-hysterectomy.
		1 Unknown
30-60	4	Recovered
60-90	1	Recovered
90-120	2	Recovered
> 120	3	1 Euthanised
		1 Died after 3 days treatment
		1 Ovario-hysterectomy done, fate unknown

Table 2. Creatinine levels and response in pyometric bitches (n = 20)

Creatinine (mg/dl)	No. of animals	Response
< 1.5	2	Recovered
1.5 – 2	8	Recovered
2 – 3	5	4 Recovered
		1 Died after 6 day treatment and ovario- hysterectomy.
3 – 5	2	Recovered
> 5	3	1 Euthanised
		1 Died after 3 day treatment
		1 Ovario-hysterectomy done, fate unknown

were subjected to ovariohysterectomy.

The average BUN level in pyometric bitches on the day of presentation was 63.93 ± 14.1 mg/dl (5.3 – 215 mg/dl). The average initial creatinine level was 3.29 ± 0.62 mg/dl (1.4 – 11.3 mg/dl). Ten (50%) patients were found to have BUN less than 30 mg/dl initially good response was obtained in the present study in all patients with BUN less than 120 mg/dl except one (Table 1). Eighteen (90%) patients had plasma creatinine level more than 1.5 mg/dl at the time of presentation. The levels were marginally higher (1.5 – 2 mg/dl) in 8 patients (Table 2). The bitch that did not respond to $PGF_2\alpha$ treatment or surgical treatment had creatinine and BUN levels of 2.3 mg/dl and 23.9 mg/dl, respectively. The cause of treatment failure in this case could be the severe metabolic derangements.

The normal range of BUN and creatinine in canines is 10 – 30 mg/dl and 0.5 – 1.5 mg/dl, respectively, (Kaneko *et al.*, 1997). The pus filled uterus produces a "toxic state" leading to decomposition of body protein as a result of suppurative process and reduced renal perfusion (Ascheim, 1965; Borreson, 1980; Wykes and Olson, 1993). Urea and creatinine are waste products normally excreted by the kidneys. Both are indicators of the glomerular filtration rate (GFR) and their blood levels increase with a decreased GFR (Neel and Grindem, 2000).

Eight animals had initial creatinine concentration between 1.5 to 2 mg/dl. Since these marginally high levels may be due to non-creatinine chromogens, which have no significance (Neel and Grindem, 2000), therefore, animals having creatinine levels more than 2 mg/dl were considered to be azotemic. Thus azotemia (BUN > 30 mg/dl and / or plasma creatinine > 2 mg/dl) was considered to be present in 50% cent of the pyometric bitches. Death/complications occurred in 40% of the azotemic bitches in the present study. This finding is consistent with the reports of other workers (Renton *et al.*, 1971; Gyula *et al.*, 1985). In the present study,

three animals, which had creatinine levels more than 5 mg/dl also, had BUN more than 120 mg/dl. These animals did not survive and had poor prognosis.

It thus appears that the pyometric bitches having BUN and creatinine more than 120 and 5 mg/dl, respectively, have a poor prognosis and should not be treated with medicines but subjected to hysterectomy.

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