

# EVALUATION OF CONVENTIONAL TREATMENT IN THE MEDICAL MANAGEMENT OF DIFFERENT DEGREE OF AZOTEMIA IN DOGS

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Twenty four dogs naturally suffering with uremia were selected for the present study. They were divided into four groups based on the level of blood urea nitrogen. Higher incidence of uremia in GSD, Non-descript, Pomeranian, Labrador Retriever, Spitz, Lhasa Apsos and Rajapalayam. Haematological values viz. Hb, PCV, TEC and TLC were found to be slightly lower or within normal reference range in all the groups. Blood urea nitrogen, serum creatinine levels were increased than normal in all the animals; but, after peritoneal dialysis and conventional medical management. BUN and creatinine levels decline significantly in group I, II and III. In group IV, BUN level did reduced but not to complete normalcy, whereas creatinine level did not change after treatment. Hence, it is concluded that BUN > 140 mg/dl and creatinine >5 mg/dl, in such condition peritoneal dialysis with combination of Dopamine and Furosemide protocol prolong the life of animal but not the health to save the life.

**Keyword :** Azotemia, Blood urea nitrogen, Serum creatinine, Dopamine, Furosemide, Peritoneal dialysis.

## Introduction

Renal failure is a well recognized cause of morbidity and mortality in geriatric dogs. Though it is not limited to any age, sex or breed of dogs, it is more prevalent in aged animals. The success of treatment of renal failure depends largely on the selection of suitable diuretic treatment and frequency of

dialysis with respect to severity of case. Fluid therapy along with furosemide is being widely used by veterinary physicians to initiate diuresis in oliguric/anuric patient where as low dose of dopamine with minimal systemic effect has shown same results.

Recently a combination of Dopamine and Furosemide is being considered to manage the renal failure cases in a better way. Peritoneal dialysis has been used extensively in human medicine as a method of extra renal means of excretion of metabolic waste products in the recent year but to limited degrees in the dogs.

Hence, the present investigation was undertaken to evaluate peritoneal dialysis and conventional therapy in different categories of azotemic dogs.

## Materials and Methods

Twenty four clinical cases of renal failures in dogs were selected on the basis of history and clinical examination, blood urea nitrogen and serum creatinine level. These cases were divided into four groups, moderate azotemia (BUN 50 – 90 mg/dl), divided in to two group on basis of treatment given to animals, severe azotemia (BUN 90 – 140 mg/dl) and very severe ( BUN 140mg /dl and above) based on degree of azotemia ad below:

Group	Treatment group	No. of animals	Treatment schedule
I	(BUN 50-90 mg/dl) for moderate azotemia	6	<b>Dopamine</b> (0.1 mg/kg) and <b>Furosemide</b> (5 mg/kg) fluid therapy (as per need)
II	(BUN 50-90 mg/dl) for moderate azotemia	6	<b>Peritoneal dialysis</b> with fluid therapy (as per need). <b>Dopamine</b> (0.1 mg/kg) and <b>Furosemide</b> (5 mg/kg)
III	(BUN 90-140 mg/dl) for Severe azotemia	6	<b>Peritoneal dialysis</b> with fluid therapy (as per need). <b>Dopamine</b> (0.1 mg/kg) and <b>Furosemide</b> (5 mg/kg)
IV	(BUN 140 mg/dl and above) for very severe azotemia	6	<b>Peritoneal dialysis</b> with fluid therapy (as per need). <b>Dopamine</b> (0.1 mg/kg) and <b>Furosemide</b> (5 mg/kg)

Haematological examination viz Hb, PCV, TEC, Biochemical examination viz. BUN, serum creatinine, total protein, albumin, sodium and potassium, calcium and phosphours were estimated. Urine analysis such as Specific gravity , pH, protein and sediment was examined. Peritoneal dialysis was performed following the procedures as describe by Chew et al. (2000).

### Results and Discussion

Overall 42% prevalence of renal failure was recorded at Teaching Veterinary Clinical Service Complex (TVCS) of Nagpur Veterinary College, Nagpur. Out of thirty five dogs with renal failure, eight were below five years (22.86%), 12 were between five to ten years (34.29%) and 15 were above ten years (42.85%). The higher incidence of renal failure in older dogs wae reported by Cowgill and Spargler (1981).Out of thirty five dogs GSD showed higher prevalence around 25.72%, Pomeranian 20%, Nondescript 17.15%, Labrador retrievers 17.14%, Lhasa Apsos 11.14%, Spitz 5.17% and Rajapalayam 2.86%. Sex-wise incidence revealed 54.29% in male and 45.71% in female.

The most predominant symptoms observed were weakness, vomition, diarrhoea, dehydration, uremic breath, ulcerative stomatitis, polyuria, polydypsia, subnormal temperature, elevated respiratory and pulse rate.

The above clinical symptoms improved after treatment in group T1, T2 and T3, but in group T4 clinical symptoms remained persistent even after massive medical management.

The pooled mean of body temperature for group were recorded as 99.51±0.49°F(Gr-I); 99.94±0.49°F(Gr-II); 99.78±0.27°F (Gr-III) and 99.93±0.28°F(Gr-IV).These differences were non-significant.

In the present study it is observed that, initially in renal failure dogs, the body temperature were subnormal while after treatment attains to normalcy. These findings are in accordance with Joshi et al. (1989) and Cowgill and Francy(2005) who reported

hypothermia in acute renal failure,dogs might be due to nephrosis,depression and sedative effect of toxicants.

The pooled mean of respiratory rate for groups were 35.79± 2.45 (Gr.I),34.45±2.75 (Gr.II),35.83±2.74 (Gr.III) and 53.45 ± 2.87 (Gr.IV).The difference between group I,II and III was found non-significant;but rest of difference were significant.The increased respiratory rate before treatment might be due to the progressive development of metabolic acidosis ( Cowgill and Francy ,2005).These findings are in accordance with English (1974),Mahajan (2000) and Kaushik (2004).

The pooled mean of pulse rate for groups were recorded as 126.20±3.04 (Gr I);154.37±4.71(Gr II); 126.16±4.70 (Gr.III) and 146.45±4.56 (Gr.IV).The difference between group I and group III was found non-significant.However,rest of the differences was significant.The increase in pulse rate before treatment can be attributed to terminal dehydration.These findings are in accordance with English (1974),Joshi et al. (1989).After treatment the mean values of pulse rate decreased significantly (P<0.01) which was restored almost to normal in all treated groups.Kaushik (2004)also reported similar findings in renal failure dogs.

Haematological investigations (Hb%, PCV%, TEC and TLC) were within normal reference range or slightly lower in T1, T2, T3 and T4 groups on 0, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> day and did not show any significant change.

Serum urea and creatinine in all the groups were significantly higher than normal reference values in all the groups. While serum creatinine level in T1, T2 and T3 restored after medical management, but in T4 group serum creatinine level remained elevated on 0, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> day (Table 1 and 2). Serum sodium, potassium, calcium phosphorus, total protein and albumin levels were recorded within normal reference range but slightly towards lower in groups T1, T2, T3 and T4 on day 0, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> day and did not show any significant difference before and after treatment.

**Table 1. Mean and ±S.E. of serum creatinine (mg/dl)**

Days Group	0 Day	1 <sup>st</sup> Day	2 <sup>nd</sup> Day	3 <sup>rd</sup> day	Pooled mean
T1	1.44±0.24	1.3±0.17	1.21±0.16	0.97±0.06	1.23 <sup>a</sup> ±0.09
T2	3.09±0.24	2.07±0.17	1.64±0.14	1.12±0.06	1.98 <sup>b</sup> ±0.19
T3	3.032±0.22	2.54±0.15	2.15±0.15	1.66±0.14	2.34 <sup>b</sup> ±0.19
T4	8.52±0.70	8.57±0.69	8.72±0.67	8.73±0.67	8.63 <sup>c</sup> ±0.18

<b>Pooled mean</b>	4.02 <sup>B</sup> ±0.59	3.62 <sup>AB</sup> ±0.63	3.43 <sup>A</sup> ±0.66	3.12 <sup>A</sup> ±0.70	
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Serum creatinine levels reduced as compared to 0 day in T1,T2 and T3 group. In T4 group, serum creatinine level did not show any significant change even after peritoneal dialysis

with combination therapy of Dopamine and Furosemide. According Gabrisch (1973) reported that creatinine was more reliable diagnostic tool compared to that of serum urea.

**Table 2. Mean and ±S.E. of blood urea nitrogen (BUN) (mg/dl)**

<b>Days Group</b>	<b>0 Day</b>	<b>1<sup>st</sup> Day</b>	<b>2<sup>nd</sup> Day</b>	<b>3<sup>rd</sup> day</b>	<b>Pooled mean</b>
<b>T1</b>	73.96±5.59	52.21±4.55	33.78±2.16	26.81±0.82	46.69 <sup>a</sup> ±4.26
<b>T2</b>	84.51±2.07	53.66±4.77	30.88±2.54	20.15±1.99	47.30 <sup>a</sup> ±4.85
<b>T3</b>	138.3±0.70	96.8±4.91	66.86±4.59	25.86±1.05	80.45 <sup>b</sup> ±4.88
<b>T4</b>	243.85±21.37	135.58±16.41	77.68±4.72	43.73±2.27	125.21 <sup>c</sup> ±5.00
<b>Pooled mean</b>	135.15 <sup>D</sup> ±15.11	84.56 <sup>C</sup> ±8.54	50.80 <sup>B</sup> ±4.45	29.14 <sup>A</sup> ±2.015	

Serum nitrogen levels were markedly reduced on day 3 post treatment as compared 0 day in all the groups. Similar findings were also recorded by Graziani et al. (1983) and Shivakumar (2001).

In the present study, routine analysis of urine revealed proteinuria ranging from distinct narrow ring (+) to very wide ring (+++) in all the 24 clinical cases. Further microscopic examination of urine sediment revealed the presence of WBC, RBC cast, granular cast, hyaline cast, renal epithelial cells, transitional and squamous epithelial cells in variable number in individual dogs under all the groups. After medical management proteinuria and sediment was either absent or present to a distinct narrow ring (+) on last day of experiment. In the present study, the mean urine pH was found within the normal reference range in all the treated groups.

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