

COPARATIVE THERAPEUTIC EVALUATION OF NEPHROLIV IN RESPECT OF ULTRASONOGRAPHIC CHANGES IN RENAL FAILURE CASES OF DOGS

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Introduction

Renal failure is one of the most frequent problem in dogs responsible for high mortality rate. Recently, herbal medicine has attracted the clinicians as an effective drug for cure of various diseases due to its tissue rejuvenator property, cheap in cost and without any side effects. Early diagnosis and satisfactory management of renal failure possess a great challenge to the veterinary clinicians. Ultrasonography had made its place in the diagnosis of various diseases during 1980, Cartee et. al. (1980) worked on the usefulness of ultrasonography in the diagnosis of renal diseases and found it useful in the diagnosis of hydronephrosis, renal calculi and renal neoplasia. Ultrasound is often superior to radiography in obtaining accurate renal measurements (Robertson and Seguin; 2006).

Materials and Methods

A total number of 15 out of 483 clinical cases of renal failure were selected based on history, physical examination and biochemical evaluation with having serum creatinine > 2mg/dl and BUN > 25mg/dl. Fifteen clinical dogs were divided into three groups: (Group I, II and III) consisting of 5 dogs in each group. Dogs of Group I were treated with *Boerhaavia diffusa* root extract @ 200mg/kg b.wt. p.o along with peritoneal dialysis and fluid therapy while dogs of Group II were treated with peritoneal dialysis and fluid therapy. Dogs of Group III were treated with Nefroliv capsule (marketed by Indian Herbs Ltd) at the dose rate of 2 capsules twice daily for adults and 1 capsule twice daily for pups p.o. along with Peritoneal dialysis and fluid therapy.

Fresh roots of *Boerhaavia diffusa* were procured, cleaned and aqueous extract were prepared as per protocol described by Pareta et. al. (2011). The haematological parameters i.e.

Haemoglobin (gm%), total leucocyte count (TLC) and differential leucocyte count (DLC) were studied by blood cell counter. The biochemical parameters viz. serum creatinine, blood urea nitrogen(BUN), serum GGT, total protein, albumin, serum sodium, serum potassium were estimated by autoanalyser. Urine sample was collected in sterilized beaker through catheterization of dogs for routine urine analysis. Ultrasonographic evaluation of the Kidneys was performed as per the standard method Nyland and Mattoon (1995) and Peritoneal dialysis was done as per method described by Chew et. al.(2000). Biochemical, Urine analysis, Ultrasonographic evaluation and Peritoneal dialysis were performed on day 0, 3, 9 and 15 of observation. Statistical analysis was done as outlined by Snedecor and Cochran (2004).

Results and Discussion

The clinical signs observed in dogs suffering from acute renal failure were anorexia, weakness, vomiting, diarrhea, dehydration, uremic breath, subnormal temperature, elevated respiratory and pulse rate, the same finding was also observed by Lee et. al., (2012), Kumar et. al.,(2011), Stanley and Langston (2008), Lew et. al. (2006), Ross (2006), Cowgill and Francy (2005). The mean values of Hb revealed no significant variation among groups. TLC values were decreased significantly on 9th and 15th day of treatment and returned to normal after treatment. Neutrophilia and lymphopaenia were consistent findings. The mean serum creatinine level decreased gradually in all the three groups on 3rd, 9th and 15th day of treatment. Increase in BUN level was observed on 0 day of observation which significantly decreased as treatment proceeded and returned to normal on day 15 of observation in all the three groups.

Table 1. Biochemical parameters (mean±S.E.) in dogs with renal failure.

Groups	Day 0	Day 3 rd	Day 9 th	Day 15 th
Serum creatinine mg/dl)				
I	2.92 ± 0.36 ^B	1.91 ± 0.32 ^A	1.34 ± 0.39 ^{aA}	1.00 ± 0.24 ^A
II	3.44 ± 0.24 ^C	3.15 ± 0.20 ^C	2.38 ± 0.16 ^{bb}	1.20 ± 0.12 ^A
III	3.41 ± 0.64 ^C	2.50 ± 0.64 ^{BC}	1.23 ± 0.19 ^{aAB}	0.85 ± 0.02 ^A
BUN (mg/dl)				
I	94.24 ± 4.27 ^{abD}	63.64 ± 0.81 ^{bc}	21.36 ± 0.92 ^{bb}	10.45 ± 0.51 ^{aA}
II	84.80 ± 1.01 ^{aD}	76.03 ± 1.42 ^{cc}	50.95 ± 1.43 ^{cb}	22.90 ± 1.44 ^{ba}
III	95.24 ± 3.62 ^{bc}	50.81 ± 3.81 ^{ab}	11.57 ± 0.62 ^{aA}	8.67 ± 0.21 ^{cA}
Serum Sodium				
I	153.33 ± 2.26 ^C	149.68 ± 2.68 ^{BC}	143.84 ± 2.81 ^{AB}	140.31 ± 2.29 ^A
II	150.05 ± 2.86 ^B	147.18 ± 3.14 ^{AB}	140.80 ± 2.81 ^A	138.76 ± 2.65 ^A
III	155.40 ± 1.87 ^C	148.76 ± 1.56 ^B	142.70 ± 0.99 ^A	141.20 ± 1.07 ^A
Serum Potassium				
I	5.80 ± 0.21 ^C	5.02 ± 0.14 ^{ab}	4.12 ± 0.12 ^{aA}	3.94 ± 0.11 ^A
II	5.95 ± 0.18 ^C	5.68 ± 0.17 ^{bc}	4.88 ± 0.22 ^{bb}	4.07 ± 0.15 ^A
III	5.93 ± 0.27 ^C	4.62 ± 0.07 ^{ab}	4.08 ± 0.10 ^{aA}	3.88 ± 0.14 ^A

Value (Mean±S.E) bearing no common superscript (Capital letter in row and small letter in column) vary significantly at P≤0.05.

The ultrasonographic observation of kidneys revealed hyperechoic cortex in 6 dogs out of 15 clinical cases, the echogenicity of cortex increased slowly and it became comparable to that of liver. Loss of contour and no clear-cut demarcation in cortex and medulla was noticed in 4 out of 15 cases. In 9 cases kidneys became enlarged. All the abnormal findings became almost normal in most of the cases after treatment. The present findings were in accordance with the findings of Temizsoylu *et. al.*(2006) who observed hyperechoic kidney in 7 dogs of ARF and Zwingenberger (2008) observed loss in cortico-medullary differentiation in acute renal failure cases while Tripathi and Mehta (2011) found loss of architectural detail, hyperechoic periphery and indistinct contour. Similar, findings were also demonstrated by Mugford *et. al.* (2013), Ross (2011), Ross (2006) and Robertson and Seguin (2006).

In few cases of dogs suffering from acute renal failure ultrasonographic images of kidney did not showed major abnormalities and having almost normal architecture and cortices with normal echogenicity. Similar finding were also observed by Stanley and Langston (2008).

Summary

The Ultrasonographic examination showed better configuration and contour of kidney in group III treated with Nefroliv +

Peritoneal dialysis + Fluid therapy, in comparison with the animals of group I treated with *Boerhaavia diffusa* + Peritoneal dialysis + Fluid therapy. Further it can also be concluded that ultrasonography provides additional and clear-cut information to that obtained by physical and laboratory examinations. Ultrasonography can contribute much information towards the diagnosis of renal failure cases in dogs and its inclusion and frequent use will be of great value in Veterinary medicine.

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