SUCCESSFUL MANAGEMENT OF VIPER ENVENOMATION INDUCED ACUTE KIDNEY INJURY AND ITS PROGRESSION TO CHRONIC KIDNEY DISEASE IN A DOG

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Viper venom has potent nephrotoxic effects which can cause acute kidney injury (AKI). In advanced AKI grades, supportive therapy usually is insufficient for sustaining life and renal replacement therapy like intermittent haemodialysis needs to be applied. Sequelae of recovery from AKI can be development of chronic kidney disease (CKD) as there is substantial reduction in functional renal mass. This report describes a case of AKI in a dog induced by viper envenomation, its management with intermittent haemodialysis in addition to supportive therapy; the case finally progressed to CKD and was managed accordingly.

A four-year-old Rottweiler, 42kgs, was presented to cochin pet hospital with a recent history of viper envenomation. Clinical examination revealed fang marks near the muzzle. Catheterization of urinary bladder revealed haematuria. Anti-snake venom was administered along with supportive therapy *viz.* injection amoxicillin sulbactam @ 20mg/kg, inj. pantoprazole@ 1mg/kg, inj. furosemide @1mg/kg and inj. Dextrose Normal Saline intravenously.

On day 2, the dog was anorexic and dull. Blood pressure was normal. The case progressed from AKI Grade I to Grade III, as per the International Renal Interest Society (IRIS) guidelines (2013) within 3 days. The rise in the serum creatinine, phosphorus and BUN concentrations (104.2mg/dl), oligouria and the overall clinical conditions made it necessary to put the dog through intermittent haemodialysis on day 5. This in agreement with the IRIS guidelines, 2013. Blood flow rate ($Q_{B)}$ was 120ml/min for first one hour and was later 150ml/min for 3 hours. Duration of dialysis was 4 hours. Ultrafiltration rate was 3500 for four hours. Sodium prescription was kept at 150mmol/L for first half an hour, later adjusted to 145mmol/L. Post dialysis there was a considerable reduction in serum creatinine, phosphorous and BUN. Urine production was recorded. The life threatening uremic crisis was managed sucessfully. This is in agreement with Bloom and Labato (2011). The dog was sent home on day 6. Commercial renal diet and sucralfate @0.5g BID were prescribed.

Table 1: Values of BUN, serum creatinine, serum phosphorous and urine production

Day	BUN	Serum creatinine	Serum phosphorous
Day 2	46.1	1.4	3.5
Day 3	66.4	2.4	5.3
Day 4	87.9	2.8	8.0
Day 5	104.2	3.2	10.2
Post dialysis	53	1.7	6

Dog was reviewed after 7 days. The appetite was normal. Dog had accepted the renal diet. Serum creatinine was 1.6mg/dL,

BUN was 46.1 mg/dL and serum phosphorous was 5.4mg/dL. The owner reported the urine to be pale colored. Routine urine examination revealed a clear pale yellow urine with a low specific gravity 1.018, presence of +2 epithelial cells. There was no evidence of urinary tract infection. Urine protein creatinine ratio was 0.53. the dog was proteinuric. Chronic Kidney Disease stage 2 diagnosis was made on the basis of the above findings, as per the IRIS guidelines (2013). Post recovery, AKI can develop to CKD. This is in agreement with Chew *et al.* (2013) who reported that one of the sequelae of AKI could be CKD. Enalparil was prescribed orally @0.25mg/kg BID for 10 days. Commercial renal diet and sucralfate @0.5g total dose BID was continued. Dog was reviewed again after 10 days. The serum creatinine value dropped to 1.4mg/dL, BUN was 43.2mg/dL and serum phosphorous was 5mg/dL. Proteinuria had reduced in magnitude to borderline proteinuric range (0.33). This finding is in accordance with Brown *et al.* (2013) who reported that angiotensin converting enzyme inhibitor (ACEi) could be a treatment of choice for dogs with proteinuria. Monthly review was continued for the dog for a period of six months and the dog was successfully maintained at stage2 CKD with renal diet.

Summary

A case of acute kidney injury induced by viper envenomation treated with intermittent haemodialysis and supportive therapy which progressed to chronic kidney disease stage 2 and its successful management is discussed.

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