INTRODUCTION

Extracorporeal renal replacement therapy (ERRT) has been proposed for the treatment of dogs with acute kidney injury (AKI) when renal function fails to recover despite adequate medical management. Canine leptospirosis is associated with profound cytokine imbalances, which lead to significant systemic derangements. Reducing the concentration of cytokines with pathological overexpression by hemoadsorption offers a promising therapeutic option in critically-ill patients to control the inflammatory response, decrease vasoplegia, and improve organ function. This case report describes the first time use of a novel hemoadsorption device (VetresQ®) as an adjunct therapy.

CASE PRESENTATION

A non-vaccinated 4 years-old intact Labrador was presented for four days of lethargy, polydipsia, hematemesis, dysorexia and vomiting. The referring veterinarian highlighted severe azotemia (urea = 45 mmol/L [RI: 2.5-9.6] and creatinine = 450 µmol/L [RI: 44-159]), moderate increased in liver enzymes (ALT = 313 IU/L [RI: 10-125] and AlkP = 230 U/L [RI, 23-212]) and hyperphosphatemia (131.4 mg/L [RI: 24-48]). Urinalysis showed isosthenuria (USG = 1.020), slight proteinuria, moderate hematuria and severe glucosuria. Complete blood count was unremarkable. Leptospirosis was diagnosed based on positive blood and urine PCR. The therapeutic plan included fluid therapy with Lactate Ringer solution, antimicrobials with amoxicillin and clavulanic acid 20 mg/kg IV 3 times a day, and symptomatic treatment for gastro-intestinal signs. Due to the lack of clinical and biological improvement, the dog was referred to our intensive care unit.

Upon admission, the dog presented marked obtundation, ptalism, and hypothermia at 37.5°C. Abdominal ultrasound showed biliary mucocele, bilateral acute nephropathy, slight perirenal effusion, and moderately dilated bladder. Thoracic radiographs showed interstitial to alveolar pattern more severe in the caudal lungs, consistent with pulmonary hemorrhages (Figure 1). Biochemistry showed worsening azotemia (urea = 86.3 mmol/L and creatinine = 988 µmol/L), leading to the decision to initiate ERRT.

VetresQ® is a hemocompatible porous sorbent technology used to reduce excessive inflammatory mediators based on devices safely used in Human critical care. VetresQ® was implemented during the first ERRT session and this session was well tolerated (Figures 2 and 3). Because of rebound increase of renal parameters, the dog received a total of 5 ERRT sessions during its hospitalization (Figure 4). Each ERRT session was a 4-hour intermittent venoovenous hemodiafiltration with VetresQ® device only implemented within the first session. No adverse effect or clinical deterioration were noticed with the use of VetresQ®. After the 5th ERRT session, renal parameters were stable.

During its hospitalization, the dog received fluid therapy, ampicillin/sulbactam, ursodesoxycholic acid, metoclopramide, maropitant citrate, and amlodipine. Its general condition gradually improved and the dog was successfully discharged 15 days after admission, with persistent azotemia (urea = 12.3 mmol/L and creatinine = 410 µmol/L). Physical exam and blood renal parameters were within normal limits 1 and 6 months after discharge.

CONCLUSION

This case report is the first description of the well-tolerated and successful use of a novel hemoadsorption device in a dog with AKI associated leptospirosis during ERRT in veterinary medicine. VetresQ® might be a promising adjunctive therapy for ERRT in the management of AKI secondary to diseases with pathologic elevation in cytokine concentrations, such as leptospirosis. Adsorption is concentration-dependent, cytokines with a reduced expression are not removed from circulation, bringing the patient’s cytokine profile closer to a physiologic balance. Future studies will evaluate the effects of hemoadsorption on cytokines concentrations and renal function in a larger number of animals.

REFERENCES