

CASE REPORT

Cytomegalovirus encephalitis in a hemodialysis patient: a rare association

Alberto Vera¹, Pablo Ruano², Esther Ortega², Borja Quiroga²

¹Cardiology Department, Hospital Universitario de la Princesa, Madrid, España; ²Nephrology Department, Hospital Universitario de la Princesa, Madrid, España

SUMMARY

Haemodialysis patients are at greater risk of infections than individuals not on dialysis due to their immunosuppressive state caused by several factors (uraemia, vascular access, inflammation, malnutrition). However, infections affecting the central nervous system are not frequent in this population. We present the case of a 77-year-old man with end-stage renal disease who was admitted to the emergency department for a decreased level of consciousness and fever. Although the initial clinical suspicion oriented to a urinary infection, the lack of improvement forced us to perform a lumbar puncture. Five days after cerebrospinal fluid was cultured, cytomegalovirus was isolated and ganciclovir initiated.

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INTRODUCTION

Cytomegalovirus (CMV) encephalitis is a rare condition in the general population, reaching a certain prevalence in populations with impaired immunity such as HIV patients, transplant recipients or those immunosuppressed by other causes (Arribas *et al.*, 1996). To date no cases of CMV encephalitis have been reported in patients with chronic kidney disease (CKD) on hemodialysis. Some circumstances aggravate the susceptibility of CKD patients to opportunistic microorganisms such as the decrease in the number and response of T lymphocytes or altered antigen presentation (Kelly, 1994; Eleftheriadis *et al.*, 2007; Lisowska *et al.*, 2012). Here we describe the first case of CMV encephalitis in a patient with advanced CKD on hemodialysis.

CASE REPORT

A 77-year-old man with advanced CKD on hemodialysis, hypertension, type II diabetes, hypercholesterolemia, two vessel coronary disease, mitral and aortic insufficiency, obstructive sleep apnea treated with CPAP, Parkinson disease, and right renal cancer (T1N0M0) treated by nephrectomy was admitted to the emergency department with fever, confusion, lethargy and drowsiness of 2 days' evolution.

On physical examination, his blood pressure was 157/78 mmHg, heart rate 80 beats per minute, temperature 37.5°C and oxygen saturation 100%. The patient was drowsy, disoriented in time and place, eupneic at rest with

dehydration of skin and mucous membranes. There was no increased jugular venous pressure. The heart sounds were rhythmic with a systolic murmur in mitral focus. Pulmonary auscultation and abdominal examination did not show significant abnormalities. He had an autologous radiocephalic fistula that was normal. Blood test revealed hemoglobin of 10.3 g/dl, mean corpuscular volume of 84 fL, platelets of 435000/mm³, and leukocytes of 13490/mm³ (with 90% neutrophils). Coagulation was normal. He had aglycaemia of 116 mg/dl, urea of 64 mg/dl, creatinine of 4.6 mg/dl, sodium of 140 mEq/L, potassium of 3.49 mEq/L and procalcitonin of 3.26 ng/mL. The urine sediment revealed piuria and an account of 20-30 red cells per field. Previous uroculture was positive for *Proteus mirabilis* so ceftriaxone was started.

Evolution was unfavorable with persistent fever, fluctuating conscious level and disorientation so a lumbar puncture was performed after checking an unaltered computed tomography. The cerebrospinal fluid (CSF) sample was clear with normal levels of glucose, cells and proteins. Antibiotic coverage was expanded with meropenem and vancomycin. At 72 hours, CMV was demonstrated by polymerase chain reaction (PCR) in CSF so intravenous ganciclovir treatment was started. Although his initial response was favorable in the first 72 hours, the patient died a few days later due to septic shock.

DISCUSSION

Here we describe the first case of CMV encephalitis in a dialysis patient. CKD patients have a 6-fold risk of central nervous system infections compared to the general population. The most common infection is meningitis due to *Staphylococcus* and *Mycobacterium tuberculosis* followed by brain abscess. Regarding viral encephalitis, patients with advanced CKD have 8 to 15-fold higher risk for developing these infections, the etiology most frequently being herpes and varicella-zoster viruses (Gunst *et al.*, 2013). Infections in hemodialysis patients impact mortality and

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Corresponding author:

Borja Quiroga

E-mail: borjaq@gmail.com

morbidity and their detection is not always easy due to the chronic and asymptomatic increase in acute phase reactants and the nonspecific symptoms (Maschke *et al.*, 2002; Quiroga *et al.*, 2014). The causes that explain the enhanced rate of infections in this population include innate and acquired immune-deficiencies, uremia, comorbidities such as diabetes mellitus or chronic inflammation state. Other risk factors include vascular access (specifically catheters) or advanced age. Unfortunately, the presentation of infections in hemodialysis patients is not always standard and some patients remain underdiagnosed or receive intensive antibiotic therapy to cover the majority of microorganisms.

In conclusion, CKD causes a significant degree of immunosuppression, as evidenced by the appearance of opportunistic infections such as CMV encephalitis.

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