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Original article

Thirteen treated of acute renal failure secondary to multiple myeloma with high cut off filters☆

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ABSTRACT

Introduction: Multiple myeloma (MM) is a haematological tumour that is characterised by uncontrolled proliferation of plasma cells and a significant volume of serum free light chains (sFLCs), which can cause acute renal failure due to intratubular precipitation, resulting in cast nephropathy.

Acute renal failure is a complication that can arise in more than 20% of patients with multiple myeloma, half of which will require dialysis.

Methods: We report our experience with 13 patients who were treated with dialysis using *high cut off filters* (HCO) between July 2011 and February 2015.

A total of 6 consecutive 6-h sessions were performed using a 2.1 m^2 HCO filter (Theralite® by Gambro®). Afterwards, further 6-h sessions were continued on alternate days.

Results: A total of 151 sessions were conducted, with an average of 11.6 sessions per patient (range 6–27).

The treatment proved to be effective in removing both kappa and lambda sFLCs, resulting in a 93.7% fall in sFLCs by the end of treatment. The average reduction was 57.7% per dialysis session. 10 out of the 13 cases recovered sufficient renal function to become independent of dialysis.

There were no major changes in albumin levels using an infusion protocol of 2 50-ml vials of 20% albumin at the end of the dialysis session.

Conclusions: Combination treatment with chemotherapy and long dialysis with HCO filters was effective in reducing the sFLC levels and recovering sufficient renal function in

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77% of cases. With HCO filters, significant cost savings are achieved, contrary to what was previously believed.

Trece tratamientos de la insuficiencia renal aguda secundaria a mieloma múltiple con filtros de *high cut off*

Palabras clave:
Mieloma múltiple
Insuficiencia renal aguda
Diálisis con filtros de *high cut off*

RESUMEN

Introducción: El mieloma múltiple (MM) es una tumoración hematológica que se caracteriza por la proliferación incontrolada de células plasmáticas y la existencia de una importante cantidad de cadenas libres en sangre (CLLs) que puede ocasionar un fallo renal agudo por la precipitación intratubular de ellas, causando nefropatía por cilindros.

La insuficiencia renal aguda es una complicación que puede presentarse en más de un 20% de los pacientes con MM, y la mitad de estos precisarán diálisis.

Métodos: Presentamos nuestra experiencia de 13 pacientes tratados con diálisis mediante filtros de *high cut off* (HCO), durante el período comprendido entre julio de 2011 y febrero de 2015.

Se realizan 6 sesiones consecutivas de 6 h de duración, utilizando un filtro de HCO (Theralite® de Gambro®) de 2,1 m^2 de superficie. Posteriormente se continúa con sesiones a días alternos de igual duración.

Resultados: Se realizaron un total de 151 sesiones; una media de 11,6 sesiones/paciente (rango 6–27).

El tratamiento se mostró efectivo para eliminar tanto CLLs kappa como lambda. El porcentaje de disminución de CLLs desde el inicio hasta el final del tratamiento fue del 93,7%. La reducción media por sesión de diálisis fue del 57,7%. En 10 de los 13 casos se recuperó la función renal y los pacientes pudieron permanecer sin diálisis.

No hubo grandes cambios en los niveles de albúmina utilizando un protocolo de infusión de 2 viales de 50 mL de albúmina al 20% al final de la sesión de diálisis.

Conclusiones: El tratamiento combinado con quimioterapia más diálisis largas con filtros de HCO resultó eficaz para reducir el nivel de CLLs y recuperar un nivel de función renal suficiente en el 77% de los casos. Con filtros de HCO se consigue un ahorro significativo, en contraposición a lo descrito previamente en la literatura.

Introduction

Multiple myeloma (MM) is a neoplastic disease characterised by uncontrolled proliferation of plasma cells in the bone marrow.[1] This produces an excessive release of immunoglobulins and their fragments called light chains, The formation of cast in the distal tubules as a result of the deposit of light chains along with the Tamm–Horsfall protein causes renal failure in these patients.[2,3]

There are two types of light chain: kappa, which is a monomeric form with a molecular weight of 22.5 kDa; and lambda, which are dimers, with a molecular weight of 45 kDa.

MM accounts for 0.1% of all cancers. In Spain, it represents 13% of all haematological cancers, with over 2000 new cases every year and an incidence of 5–6 cases/100,000 population.[4] MM is observed in adults; only 15% of cases are under 50, and the peak incidence is between the ages of 60 and 70. It affects men more than women and black people more than white.[5]

Life expectancy is less than a year if the patient develops renal failure, although with treatment, it can prolonged to 5–7 years.[5,6]

Acute renal failure may occurs in up to 20% of MM patients and half of them may require dialysis. The acute renal failure may be aggravated by different circumstances, such as dehydration, hypercalcaemia, hyperuricaemia, hyperviscosity,[7] and the use of nephrotoxic drugs.

At the beginning of the disease, clinical signs are non-specific, an this may delay the diagnosis. The first symptoms, such as bone pain, pathological fractures, anaemia, fatigue, hypercalcaemia, infections, acute renal failure and others, is usually presented late.

Acute or chronic kidney disease makes the prognosis much worse.

The causes of renal dysfunction in patients with myeloma include alteration to the proximal and distal tubules as a result of tubular cell damage caused by filtered light chains, cast nephropathy, amyloidosis, light- or heavy-chain deposition