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Letters to the Editor

Acute renal failure in patients with myeloma: Experience with extended high cut-off hemodialysis☆

Fracaso renal agudo en pacientes con mieloma: Nuestra experiencia con hemodiálisis extendidas con dializadores de alto poro

To the Editor,

The aim of this study was to share our experience and add further evidence to those studies already published in the literature proposing haemodialysis (HD) with high-cut-off (HCO) dialysers as a promising option in the treatment of myeloma kidney.

We conducted a prospective study from November 2012 to February 2015 and evaluated eight patients with multiple myeloma and acute renal failure requiring dialysis, with serum free light chain (FLC) levels >500 mg/L (measured by nephelometry; FREELITE®, The Binding Site, Birmingham, United Kingdom).

All patients received treatment with bortezomib-based regimens.

The patients signed a consent form after being informed about the technique.

Two patients had renal biopsy, with a histopathology diagnosis of cast nephropathy. Renal biopsy was not performed in the remaining cases because of hemathologic abnormalities.

The patients had a 8-h HD sessions with a HCO 2100 dialyser (Theralite®, 2.1 m^2, Gambro, Deerfield, Illinois, USA), using the HD monitors routinely used in our unit (5008 CorDiax®, Fresenius Medical Care, Bad Homburg, Germany), with blood flows of 250–300 mL/min and ultrapure dialysis fluid flow of 500 mL/min.

Heparinisation was achieved with hourly doses of unfractionated sodium heparin (initial dose of 0.5 mg/kg in the first hour and 10 mg/h with adjustment according to aPTT after 4 h).

Replacement fluid after each session was albumin 20% (100 mL), monosodium phosphate (10 mL), 1 M magnesium sulphate (10 mL) and calcium gluconate. These supplements were adjusted according to the needs of each patient.

The treatment regimen included 5 sessions in consecutive days, 6 sessions on alternate days and then 3 weekly sessions until recovery of renal function and/or a reduction in FLC <500 mg/L and/or after 6 weeks had elapsed, at which time an assessment was made of whether or not to continue treatment according to the patient's clinical evolution and response to chemotherapy.

Data analysis was performed using SPSS 15.0.

Eight patients were analysed (Table 1). Three were male (37%) and five female (62%), with mean age 67 ± 9 years. Six patients (75%) had *de novo* multiple myeloma and two (25%) had relapses. One patient (12%) had a history of chronic kidney disease as a result of nephroangiosclerosis (eGFR by CDK-EPI: 49 mL/min/1.73 m^2). The FLC were *lambda* in five patients (62%). Seven patients (87%) had renal involvement at the time of diagnosis and all required HD at the start of treatment. The median number of FLC at baseline was 3415 mg/L (2740–11,975). In 3 patients (37%), HD with HCO was delayed ≥7 days from the time of diagnosis of acute renal failure.

A median of 10 extended HD sessions with HCO were performed per patient (8–19), with a mean reduction in FLC per session of 73% (61–77). In the last HD with HCO session, we observed a mean concentration of FLC (pre-dialysis) of 972 mg/L (562–2815).

Six patients (75%) had an improvement in renal function, no longer requiring HD at the end of treatment. Two patients had no improvement in renal function and had to start long-term HD programmes. The start of treatment with HD with HCO had been delayed for more than seven days in both of these patients, one of whom was refractory to chemotherapy.

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Table 1 – Clinical data of patients treated with HD with HCO.

Sex	Type MM	CRP Initial (mg/dL)	CRP Final (mg/dL)	FLC Initial (mg/L)	FLC Final (mg/L)	Reduction FLC/session (median)	No. sessions	HCO ≥ 7 days[a]
Female	IgA lambda	7.3	3.6	9330	1300	78% (21–64)	28	Yes
Female	IgG kappa	3.2	1.1	21,200	984	40% (71–88)	13	No
Male	BJ lambda	18.0	Long-term HD	3960	56	72% (58–84)	11	Yes
Female	IgA lambda	4.0	3.1	2290	519	70% (63–75)	8	No
Male	IgG lambda	3.0	2.0	2800	3320	59% (67–80)	9	No
Male	BJ lambda	4.4	2.1	10,400	1240	78% (52–70)	10	No
Female	BJ kappa	13.0	Long-term HD	12,500	3820	77% (67–84)	21	Yes
Female	IgG kappa	7.3	3.0	2720	694	77% (48–85)	6	No

FLC: free light chains; ARF: acute renal failure; HCO: high-cut-off dialysers; HD: haemodialysis; MM: multiple myeloma.
Extended haemodialysis with Gambro HCO 2100 dialyser (Theralite®) was used in all cases.
[a] Start of haemodialysis with HCO ≥ 7 days after diagnosis with MM-related ARF.

Among the patients who recovered renal function, we observed a median of 9 months free of HD (5–15). The mean follow-up time for each patient was 9 months (4–15). One patient died 11 months after starting HD with HCO because the development of sepsis with multiple organ failure, having maintained stable renal function up to that time.

Mean albumin levels were 2.6 ± 0.4 g/dL, potassium 3.3 ± 0.4 mEquiv./L, phosphorus 2.9 ± 0.6 mg/dL, calcium 8.8 ± 0.2 mg/dL and magnesium 1.9 ± 0.3 mg/dL.

Patients tolerated the sessions satisfactorily from a haemodynamic point of view, and there were no incidents of note during the sessions.

An increasing number of authors are proposing HD with HCO as effective adjuvant therapies in the treatment of myeloma kidney[1–8] (Table 2). The advantage of these techniques is their high cut-off point, up to 60 kD, which obtains greater clearance of the FLC.

The main limitation of these techniques is the lack of controlled, randomised studies. There are currently two European multicentre studies underway, EuLITE[9] and MYRE,[10] the results of which will provide more evidence on the use of these techniques.

Table 2 – Experience of different authors with haemodialysis in ARF and myeloma.

Authors	N	Technique	Recovery of kidney function, n (%)
Hutchison et al.	67	HD-HCO	42 (63)
Tan et al.	6	HD-HCO	3 (50)
Martin Reyes	6	HD-HCO	3 (50)
Buti et al.	5	HD-HCO	4 (80)
Borrego-Hinojosa et al.	5	HD-HCO	4 (80)
Khalafallah et al.	4	HD-HCO	3 (75)
Pendon-Ruiz et al.	3	HFR-SUPRA	1 (33)

ARF: acute renal failure; HD-HCO: extended haemodialysis with high-cut-off dialysers; HFR-SUPRA: haemodiafiltration with ultrafiltrate regeneration by adsorption in resin.

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10. Studies in patient with multiple myeloma and renal failure due to myeloma cast nephropathy (MYRE).

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Actinomyces viscosus infection in a kidney–pancreas trasplanted patient☆

Infección por *Actinomyces viscosus* en trasplantado de riñón-páncreas

To the Editor,

Actinomycosis is a rare, chronic, suppurative, infectious disease caused by organisms of the genus *Actinomyces*. The most common species in humans is *Actinomyces israelii*.

We present the case of a 36-year-old patient with a history of type 1 diabetes mellitus, chronic kidney failure secondary to diabetic nephropathy and bilateral salpingectomy after a non-specific acute salpingitis. The patient had a kidney–pancreas transplant and received induction with thymoglobulin, mycophenolate, tacrolimus and prednisone, after which she had a rapid improvement in renal function, normalisation of amylase and lipase, and well-controlled blood glucose levels without insulin requirements.

Two weeks post-transplant, she developed abdominal pain and fever, and was found to have leukocytosis and raised CRP. Abdominal CT showed a peripancreatic fluid collection in relation to the pancreatic fistula; percutaneous drainage was inserted and antibiotic therapy started. As the pyrexia persisted, a number of further tests were performed: urine culture, blood culture, sputum culture, determination of CMV by PCR, chest X-ray and echocardiography, all with no abnormal findings. Repeated abdominal CT scan ruled out intra-abdominal fluid or other complications.

The fever and pain persisted, accompanied by abdominal distension, abnormal liver function tests with a dissociated cholestasis pattern and pancytopenia. Further abdominal imaging and scintigraphy tests were performed which, respectively showed distension of intestinal loops and intense uptake into bone marrow. Since patient continued to deteriorate clinically, a laparotomy was performed, finding whitish nodules scattered around the intestines and bowel loop adhesions; these were released and ileocecal bypass performed with biopsies of the intestine, liver and bone marrow.

The bone marrow and liver cultures were negative, but *Actinomyces viscosus* was isolated in an intestinal sample. Histopathology examination showed acute liver damage with necrosis consistent with a toxic-drug reaction, with no significant lesions in the bone marrow. The patient was diagnosed with intestinal actinomycosis and started on intravenous penicillin, the pyrexia resolving after one week. The penicillin was continued for one month, followed by amoxicillin for a further eleven months. The abnormal liver function tests and pancytopenia resolved after withdrawal of the remaining antibiotic therapy. Ten months after transplantation, the patient is afebrile, her general condition is good and both grafts are functioning normally.

Actinomycosis is considered an endogenous, opportunistic infection of immunocompromised patients. The change in the status of *Actinomyces* from commensal to pathogenic may be the result of mucosal damage or tissue disruption.[1,2] It mainly affects three areas: the cervicofacial, thoracic and abdominopelvic regions, with the latter accounting for approximately 20% of cases.[3] Injury to the intestinal mucosa, previous surgery, cancer, diabetes, infections and states of immunodeficiency and immunosuppression generally predispose to invasion of the gastrointestinal tract. Damage to the intestinal mucosa is necessary for the bacteria to multiply and spread, which leads to the formation of fibrous tissue masses with a “woody” consistency. Our patient had mucosal disruption related to the pancreas transplant surgery, but her previous history also included bilateral salpingitis and she

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