Case Report

Reversible renal failure due to specific infiltration of the kidney in chronic lymphocytic leukaemia

Maria Isabel Comerma-Coma1, Antònia Sans-Boix1, Esperança Tuset-Andújar2, Javier Andreu-Navarro3, Alicia Pérez-Ruiz1 and Isabel Naval-Marcos1

1Renal Section, 2Haematology Section, Department of Medicine Hospital General de Manresa, and 3Pathology Department, Hospital de Sabadell, Barcelona, Spain

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Introduction

Leukaemic processes can produce renal failure in several ways [1,2] either due to the diseases themselves or to their treatment or complications. Leukemic infiltration of the kidney has been found in over 60% of the autopsies performed on patients with chronic lymphocytic leukaemia [3] (CLL), but it is only rarely associated with renal failure [4–8].

We report on one further case which illustrates some clinically important points.

Case report

The patient was a 69-year-old woman without a history of drug dependency or any known specific allergies and who had three sisters with diabetes mellitus type II. There were no further relevant pathologic background data.

At the age of 60 the patient’s condition was detected by chance in a routine analysis. The patient did not agree to be treated until 5 years later when she was admitted to the hospital with toxic syndrome. At presentation, Hct was. 25% Hb. 9 g/dl, WBC 6000/mm³ (87% lymphocytes), thrombocytes 75000/mm³, urea 52.2 mg/dl, and creatinine 1.0 mg/dl. Hypogammaglobulinemia was also present. Immunocytochemical staining showed that lymphocyte leukaemia cells were positive for CD5 90%, CD22 80%, CD25 35%, and CD19 77%. Abdominal ultrasonography revealed significant splenomegaly, minimal hepatomegaly, a right kidney of 10.3 cm, and a left kidney of 10.5 cm, without alterations. The diagnosis was B-CLL stage C Binet.

The patient was treated with 0.4 mg/kg/day chlorambucil for 2 days every 15 days and 40 mg/m² Prednisone for 4 days every 15 days. There was a slight reduction of splenomegaly and improvement of her haematological parameters, with persistent moderate thrombocytopenia (50 000–75 000 thrombocytes) and leukopenia (2000–3500 leukocytes with 22–25% lymphocytes) and no anaemia.

The treatment was discontinued 4 years later because of the patient’s stable clinical picture and haematological parameters and also because of her irregular compliance with treatment guidelines. Her renal function remained normal (urea 42 mg/dl, creatinine 0.9 mg/dl).

Six months later the patient presented with a 2-weeks history of asthenia, nausea, and vomiting without oliguria or oedema. On admission Htc was: 23.8%, Hb 8.3 g/dl WBC 4300/mm³ (47% lymphocytes), thrombocytes 39 000/mm³, urea 142.2 mg/dl, creatinine 5.8 mg/dl, Na 140 mEq/l, and K 5.2 mEq/l. Urinalysis revealed a sediment: of 2–4 leukocytes/f, 1–2 haematoctytes/f, and leukocyte accumulation, negative uroculture, and 650 mg/dl proteinuria. Ultrasound revealed a bilateral increase in kidney size over 1 cm. Her renal function deteriorated as indicated by the following parameters: urea 171 mg/dl, creatinine 6.9 mg/dl and proteinuria 1.2 g/24 h, without oliguria. Platelet transfusion and desmopressin perfusion, were performed prior to an uneventful percutaneous renal biopsy. Diffuse infiltration of small to medium size lymphoid cells with ovoid nuclei and lumps of chromatin, which separated and compressed the interstitial tubular and vascular structures (Figure 1), was seen on histology. By immunoperoxidase staining, these cells were identified as having mainly a B-cell origin (L 26-CD 20 and CD 45 RA, Biomeda®, positive). There was moderate tubular atrophy with focal and segmentary changes of tubular epithelium, as well as hyaline cylinders. There were no vascular or glomerular alterations (Figure 2). Negative immuno-
Leukaemic processes can cause prerenal failure, which can result in tubular necrosis, especially in acute leukosis, because of dehydration. Nephrotoxicity [2] secondary to antibiotic treatment (aminoglycoside) or chemotherapy or triggered by tumoral lysis syndrome [9] can occur, which can produce uric nephropathy, hyperphosphataemia or hypercalcemia with renal failure. A case of granulomatous interstitial nephritis associated with allopurinol therapy in a patient with CLL has been described [10]. Renal alterations can also appear in the course of an infection complicating leukaemia (septic shock, disseminated intravascular coagulation). Leukostasis phenomenon [11], which is an accumulation of leukaemic cells that occlude the microvasculature and also affect glomerular capillaries, has been described in acute and chronic leukaemias. An obstructive uropathy due to adenopathy or retroperitoneal masses, lithiasis, or ureteral clots must always be ruled out.

Several types of glomerulopathy associated with CLL have been described [12,13] (amyloidosis, membranoproliferative glomerulonephritis caused by cryoglobulinaemia or not, and minimal-change nephropathy). In some cases there is an improvement in the nephrotic syndrome with the leukaemia treatment. Renal failure attributed to leukaemic infiltration has been described in many cases of acute leukaemic processes [14,15]; however, there are only a few cases due to CLL with histological confirmation in literature [4–8]. In all these cases there was a massive interstitial infiltration by lymphoid cells with the same markers as peripheral lymphocytes. The effect on tubular cells was minimal and there were no glomerular or vascular alterations. The extent of renal failure was serious and some cases even required dialysis. The alterations in urine sediment were minimal and proteinuria was moderate (up to 1 g/24 h.) In the three cases the effect on the renal system was the first manifestation of CLL.

Treatment and evolution were different in each case. Only one case did not show improvement in renal function despite treatment with radiotherapy, prednisone and chlorambucil. Two cases showed functional improvement after treatment with chlorambucil and prednisone. One case was initially treated only with chlorambucil, showing improvement over a 5-month period and then a relapse. Interstitial fibrosis was observed on renal histology and function improved with corticosteroid treatment.

In the last case there was no initial improvement with chlorambucil treatment alone, but the patient later responded to radiotherapy and prednisone. In our case, renal failure due to leukaemic infiltration appeared 5 years after CLL was diagnosed and 6 months after having discontinued treatment with chlorambucil and prednisone. Renal function progressively improved with the reintroduction of prednisone with gradually decreasing doses. Functional deterioration was observed coinciding with the sudden cessation of...
prednisone treatment with a recovery following its reintroduction.
Thus, continuous corticosteroid treatment offered the best results in the case described.

References


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