casts together with dilation of the lumen and cytoplasmic vacuolisation with glomerular integrity are usually found in the kidney biopsy.[3,4] In the electron microscope study it is typical to find dilated mitochondrial cristae and an accumulation of bile acids within the lysosomes.[8]

Treatment is not specific and is fundamentally supportive. Renal replacement therapy has no specific role except for the treatment of AKI, while plasmapheresis may have a use in reducing pro-inflammatory substances.[9] Other options aimed at reducing inflammatory cytokines and bilirubin are MARS, *Coupled Plasma Filtration Adsorption* (CPFA) and plasma filtration adsorption dialysis. Steroids, cholestyramine, ursodeoxycholic acid and lactulose have demonstrated minimal benefit.[8] AS can cause these symptoms, so amateur athletes should be informed about their side-effects.

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Unnoticed iron overload leading to irreversible pancreatic damage☆

Sobrecarga férrica inadvertida hasta daño pancreático irreversible

Dear Director,

Hemochromatosis in patients with renal failure is a diagnostic challenge since there is no correlation between serum markers (ferritin, transferrin saturation [ST]) and iron deposits in this population.

Inherited hemochromatosis is a genetic disease with abnormalities in the proteins responsible for the transport of iron, resulting in iron deposition in different organs.[1] The most frequent cause of hereditary hemochromatosis is the C282Y mutation of the HFE gene. Homozygous H63D or the heterozygosis (one copy of the HFE gene mutated with C282Y and the other copy with H63D) can also produce hemochromatosis.[2]

The frequency of carriers of these mutations in Europe goes from 1 to 31%, and only 0.3% of the population is homozygous for C282Y, which is the genotype with highest risk.[3,4] Penetrance is variable, with a clinical expression manifested in up to 44% of women and in 50% of men homozygous for HFE mutations.[5]

Usually the diagnosis is suspected by elevation of ferritin and ST, and by quantification of iron in the liver using nuclear

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magnetic resonance. The diagnosis is confirmed by genetic analysis.[6]

In hemodialysis patients inflammation is associated to elevation of serum ferritin levels and does not correlate with iron overload.[7] The KDIGO Working Group recommends the administration of intravenous iron in dialysis patients with anemia and ferritin levels up to 500 ng/mL and with ST up to 30%[8]; these values overlap suspected hemochromatosis in the general population (ferritin > 200 ng/mL in men and >150 ng/mL in women with a ST > 45%).[9] This is the reason why hemochromatosis in patients with chronic kidney disease may go unnoticed.

We present the case of a patient who was diagnosed of hemochromatosis, that was not noticed during his period on time on hemodialysis until transplantation with an abrupt presentation and target organ failure.

The patient is a 60-year-old man, with a medical history of arterial hypertension and GI bleeding from duodenal ulcer and renal insufficiency of unknown etiology. In 2009 he was started on hemodialysis. In 2013 received a cadaveric kidney transplant. Induction included basiliximab and immunosuppression with triple therapy (corticoids, mycophenolate and tacrolimus) and prophylaxis according to the protocol. At the time of renal transplantation, he was treated with iron III-hydroxy sucrose (100 mg monthly intravenous) and erythropoietin alfa (5000 units weekly), and had hemoglobin levels of 11.2 μg/dL, ferritin 815 μg/mL, ST 29%, blood sugar 81 μg/dL, 5% glycosylated hemoglobin, ALT 11 U/L, AST 11 U/L, GGT 11 U/L and bilirubin of 0.4 U/L.

After transplant the patient presented acute tubular necrosis. The immediate post-transplant period was uneventful, with progressive improvement in renal function. Anemia was treated with occasional doses of darbepoetin alfa without iron administration or blood products. The patient was discharged on day 9 with Cr 2.1 mg/dL and hemoglobin of 12 g/dL. Until that time, basal glycemia and liver function remained within normal range.

He came to the clinics for the third month follow-up with malaise and the following analysis: hemoglobin 14.4 μg/dL, ferritin 1817 μg/L, ST 38%, leukocytes 11,000/μL, fasting glucose 738 μg/dL, ALT 21 U/L, AST 20 U/L, GGT 108 U/L, bilirubin 0.6 U/L, PCR 0.3 mg/dL, tacrolimus levels 14.1 ng/mL. The patient had not received erythropoietin or iron.

He was diagnosed of diabetes mellitus and insulin was started. Given the elevation of ferritin and ST the diagnosis of hemochromatosis was considered. By nuclear magnetic resonance he had hepatic iron deposition of 230 μmol/g with DE ± 50 μmol/g of dry weight. In the genetic study revealed combined heterozygosity for C282Y and H63D. During follow-up, the patient progressed to ferritin levels of 2500 ng/mL and ST of 90%. Treatment with phlebotomies was started, with improvement of the iron overload, but the pancreatic function did not improve.

The patient had deterioration of pancreatic function due to iron deposition. This case shows that in hemodialysis patients the presence of hemochromatosis could lead to a beneficial adaptation; by decreasing the release of hepcidin the availability of iron for erythropoiesis improves. After renal transplantation (uremia is corrected) and hepcidin is reduced which allows greater intestinal absorption resulting in a rapid increase of iron deposits. Iron deposits in pancreas produced β-cell dysfunction, highly vulnerable to oxidative stress. Likewise, other factors (such as corticosteroids or tacrolimus) may precipitate or further deteriorate the iron induced pancreatic damage.

Therefore, any early sign of iron overload should be monitored with other techniques such as nuclear magnetic resonance and, in selected cases; it is advisable to perform a genetic diagnosis since early treatment produces clinical improvement.

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