Dear Sir,

The purpose of the present letter is to call special attention to the increased frequency of retinal toxicity of desferrioxamine (DFO) and therefore to recommend additional caution when using this drug in dialysis patients.

DFO has been used as a chelating agent for the diagnosis and treatment of aluminum intoxication in patients with chronic renal failure. Several side effects have been reported associated with DFO administration, including hypotension, anaphylaxis, susceptibility to Mucor and Yersinia infections and auditory and ocular toxicity [1].

Decreased visual acuity and abnormal macular pigmentation were first recognized in 1983, in 2 patients with thalassemia who received large doses of DFO by continuous intravenous infusion [2]. In the same year, Simon et al. [3] reported a case of dyschro-matopsy in a dialysis patient after the intravenous infusion of 2 g DFO. Since then, cases of ocular toxicity have been communicated in individuals exposed to various doses for different pathologies [4-7]. Of interest, in large series of patients with normal renal function treated with high doses of DFO, ocular toxicity has been only occasionally detected. The ocular side effects which have been attributed to the therapy with DFO include impaired visual acuity, defective darkness adaptation, dyschromatopsia of the yellow-blue band, loss of peripheral visual fields, perimacular pigmented deposits, optic neuropathy, abnormal visually evoked potentials and fluorescein angiographic alterations [8].

We have examined the ocular toxicity of DFO in the dialysis population of a university hospital-based unit. In the last 14 years we have used DFO for the treatment of aluminum intoxication in 24 dialysis patients. All of them were submitted to a simple follow-up procedure, which consisted of funduscopic and visual acuity examinations immediately before and after (1 month and 1 year) DFO administration. DFO was administered 3 times weekly for 3 months in dosages of 5-40 mg/kg/dose. Macular changes appeared in 8 patients (33%); mostly, these changes consisted in perimacular pigmented deposits and were not significantly related with the total administered dose (p NS by χ² with the Yates correction) or the method of DFO administration (i.v. at the end of dialysis or i.m. 6 h previously to

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**Table**

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dialysis). In a control group of 22 non-DFO-treated patients from the same unit, macular changes were completely absent (p < 0.001). Only 1 of the patients with retinal changes presented a marked decrease of visual acuity, which was definitely associated with the use of DFO. At 1 year, the retinal changes had improved in only 1 patient.

The reported incidence of DFO-induced ocular toxicity in patients with normal renal function varies between 0 and 4% [9-11]. In hemodialysis patients, ocular toxicity has been reported in 17-73% of DFO-treated patients [12, 13]. Cases et al. [12] observed visual toxicity in 7 of 41 of their patients treated with 10-40 mg/kg DFO 3 times weekly. Ravelli et al. [13] reported sequential ophthalmological examination in 15 hemodialysis patients undergoing a standard DFO test (40 mg/kg): 13 complained of reduced visual acuity and 9 had macular changes. In some of these patients the ophthalmological findings did not improve.

Macular changes were, therefore, very frequent in our and others’ dialysis patients [12, 13], even with doses that were lower than those used in individuals with normal renal function. This finding strongly suggests that patients in hemodialysis have still undetected co-morbid factors for developing DFO-related retinopathy. The fact that the patients treated with DFO are not always submitted to routine funduscopic examination may result in underdiagnosis of DFO-related retinopathy. In spite of the fact that the clinical repercussion in visual acuity is less than the incidence of maculopathy, the finding of an increased frequency of DFO-related retinopathy in dialysis patients makes it more necessary to consider the use of DFO in the dialysis setting in a more conservative manner.

KAHGEH

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References


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