Ocular Toxicity after a Single Intravenous Dose of Desferrioxamine in 2 Hemodialyzed Patients

J.		Pengloan
J.		Dantal
C.		Rossazza
M.		Abazza
H.		Nivet

Unité d'Hemodialyse, Service d'Ophthalmologie, CHU Bretonneau, Tours, France

Dr. Josette Pengloan, Service d'Hémodialyse, Centre Hospitalier Régional et Universitaire de Tours, Hôpital Bretonneau, 2 Boulevard Tonnellé, F-37044 Tours (France)

Dear Sir,

The ability of desferrioxamine (DFX) to chelate aluminum is widely used to diagnose and treat aluminum overload in hemodialyzed patients. Ocular toxicity has been previously described in patients with normal renal function [1,3] and in hemodialyzed patients [5], but generally consecutive to long-term treatments.

We report 2 cases of ocular toxicity observed after a usual test dose (40 mg/kg) of DFX infused intravenously during the 4th h of a dialysis session [4] for diagnosis of aluminum overload.

Case 1: A 76-year-old woman was on maintenance hemodialysis for 6 years; she was bi-nephrectomized for pyonephrosis of polycystic kidneys. On August 28th, 1985, 2.7 g DFX was infused; generalized pruritus immediately followed the injection. On August 31st she noted impaired color vision with inability to distinguish yellow. Visual field examination was normal. The findings during color examination by means of Farnsworth's test (28Hue) confirmed dyschromatopsia with axis blue-yellow. Neither visual evoked potentials nor fluorescein angiography could be performed. Color vision improved gradually within 6 days.

Case 2: A 71-year-old woman was dialyzed for 8 years for chronic pyelonephritis. On August 28th, 1985, 2.7 g DFX was infused. Two days later she complained of impaired vision, with bilateral scotomas. Four days later visual acuity was 20/40; neither metamorphopsia nor subjective color vision disturbances were detected. Examination of the left eye fundus showed retinal hemorrhage along a vessel. No other investigations could be performed because of the patient's poor general condition. Visual disorders disappeared completely within a few days.

In these observations signs of ocular toxicity started 2

and 3 days after usual single-dose test of intravenous DFX and disappeared spontaneously within a few days. Only 1 previous case of acute visual loss with dyschromatopsia has been recorded after a single intravenous infusion of 2 g DFX. The disorder appeared a few hours after the infusion and disappeared within 48 h [2]. Disorders observed in this case and in our observations are less severe than those observed in another case where DFX was infused during each dialysis: symptoms appeared after 11 days of treatment, with complete night blindness, loss of color vision and partial regression after DFX withdrawal [5].

Mechanisms of DFX ocular toxicity, presumably related to optical neuritis and/or macula involvement, remain hypothetical. Chelation of divalent ions was incriminated but in our observations the peak of serum aluminum 48 h after the infusion was low: 86 and 71 $\mu\text{g/l}$. No iron overload was observed: in cases 1 and 2, serum iron was 6 and 8 mg/l, ferritin was 32 and 65 $\mu\text{mol/l}$, respectively. Other metals like zinc, copper, and manganese are not chelated during hemodialysis treatment [2]. Direct dose-related toxicity is possible: in 1 case disorders did not recur after using 2nd lower dose [2], whereas another case relapsed during a 2nd course of treatment without reducing the dose [5].

DFX is widely used among hemodialyzed patients to prevent and cure aluminum intoxication. Ocular toxicity might be underestimated and has to be detected at the earliest stage possible.

References

1 Davies, S.C.; Hungerford, J.L.; Arden, G.B.; Marcus, R.E.; Miller, M.H.; Huens, E.R.: Ocular toxicity of high-dose intravenous desferrioxamine. *Lancet* ii: 181–184 (1983).

212

Pengloan/Dantal/Rossazza/Abazza/Nivet

Simon, P.; Ang, K.S.; Meyrier, A.; Allain, P.; Mauras, Y.: Desferrioxamine, ocular toxicity and trace metals. *Lancet* ii: 512–513 (1983).

Lakhampal, V.; Schocket, S.; Jiji, R.: Desferoxamine induced toxic retinal pigmentary degeneration and presumed optic neuropathy. *Ophthalmology* 97:443–451 (1984).

Milliner, D.S.; Nebeker, H.G.; Ott, S.A.; Sherrard, D.J.; And-ress, D.L.; Alfrey, A.C.; Coburn, J.W.: Desferrioxamine infusion test for diagnosis of aluminum osteomalacia. *Kidney int.* 25:149 (1984).

5 Rubinstein, M.; Dupont, P.; Doppee, J.P.; Dehon, C.; Decobu, J.; Hainaut, J.: Ocular toxicity of desferrioxamine. *Lancet* i: 817–818 (1985)