attempt, two for two attempts, one for three attempts, and none if the problem cannot be solved with three attempts.

Descriptive analysis of the participants was performed and then linear regression analysis was used for assessing the influence of age, education, and gender on test performance. Group comparisons (performed by one-way ANOVA) were used for determining the normative data divisions. Statistical significance was established at 0.05.

The participant's description and test performance are shown in Table. The linear regression model was significant ($F=7.00$, $p<0.001$, $R^2=0.07$), showing influence of age ($\beta=-0.19$, $p=0.001$) and education ($\beta=0.18$, $p<0.001$) on test performance, but not of gender ($p>0.05$). The ANOVA results suggested a normative data division based on age and education, since the proposed age-education groups presented significant differences ($F=8.59$, $p<0.01$, $\eta^2=0.07$).

The TOL is a well-validated classical neuropsychological test for the assessment of planning skills. As other studies suggested, age and education were related to task performance[4]. The development of adequate normative data is essential for cognitive assessment in clinical setting. When a precise characterization of executive/planning performance is necessary, as in the assessment of different conditions like dementia, neuropsychiatry disorders, and mild cognitive impairment, stratified data for sociodemographic factors as age and education allow a more accurate interpretation of test performance and neuropsychological hypothesis testing in the clinical setting[5].

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Ibuprofen-induced unilateral optic neuritis

Neurite óptica unilateral induzida por ibuprofeno

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Visual disturbances have been reported to occur as side effects from ibuprofen (2-4'-isobutylphenyl-propionic acid) in therapeutic dosages, in <1% of the cases[1-3]. The most common visual disturbances include amblyopia, scotomata, or changes in color vision[3]. Also, the contrast sensitivity may be depressed at low spatial frequencies during treatment with ibuprofen, 800 mg/d[3]. Visual side effects occur more frequently in adults as compared to children and they are dose-dependent[4].

CASE REPORT

A 61-year-old Caucasian female, referred by the department of ophthalmology for acute and constant visual deficit (Fig 1), and papillary edema on the right eye for one week. She took ibuprofen 1,600 mg/d during seven days for lumbalgia. At the last day of ibuprofen administration, the patient experienced visual deficits on the right eye, which she described as blurring and dimming. Initially, she went to her ophthalmologist who found a visual acuity of -0.5 (left) and -0.5 (right) and fuzzy papilla, and referred her to a secondary ophthalmology center, which found a prominent right papilla due to edema and swelling (Fig 2), but did not reveal an ophthalmologic cause of the abnormality either. To exclude a central nervous system lesion, she was referred to the neurologist.

Her history was uneventful except for recurrent lumbalgia, and her family history was noteworthy only for scleroderma in her sister. She did not take any regular medication.

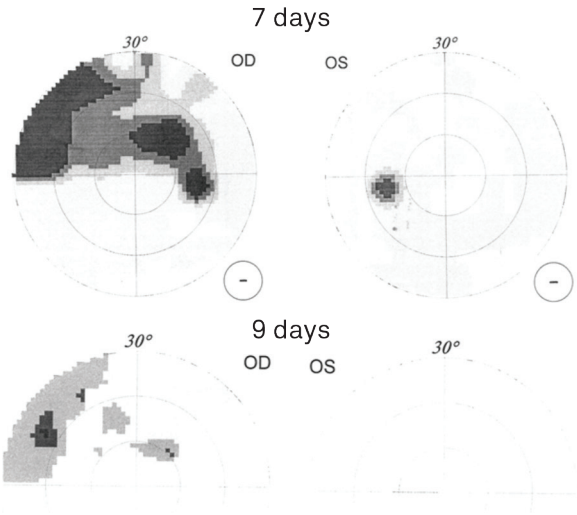

Fig 1. Visual field defects in seven (upper panels) and nine days (lower panels) after discontinuation of 1,600 mg of ibuprofen. Within nine days after ibuprofen administration, the deficits had almost completely disappeared.

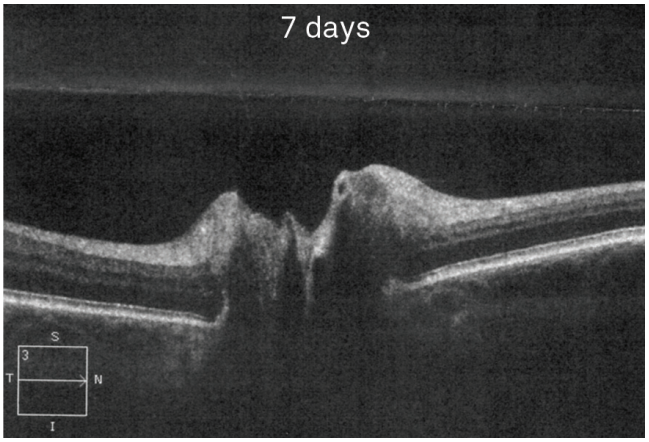

Fig 2. Optical coherence tomography of the right eye seven days after discontinuation of 1,600 mg of ibuprofen showing a prominent papilla.

Clinical exam and blood tests were noninformative. The magnetic resonance imaging (MRI) of the cerebrum did not show any abnormalities. Visually-evoked potentials, however, gave a prolonged latency of the P100 component on the right side. She was advised to refrain from misusing ibuprofen in the future and to treat lumbalgia by other means than nonsteroidal anti-rheumatic drugs. Two days after the first neurological exam and nine days after ibuprofen discontinuation, visual field defect had markedly improved (Fig 2), and further six days later, vision was normal again. The probability that the adverse reaction was attributable to ibuprofen was 4 on the Naranjo ADR scale.

DISCUSSION

Visual deficits following intake of ibuprofen have been occasionally reported[1-4]. However, the patient described here differs in several aspects from the previous cases. Contrary to previous reports[2,3], this patient was taking a higher dosage of ibuprofen. Previously reported patients took dosages of 800 mg[3] or 1,200 mg[1]. Contrary to previous reports, our patient developed visual deficits one week after starting ibuprofen. In Hamburger et al. case, visual acuity and color vision decreased not earlier than two months after starting ibuprofen[2]. In Ridder's[3] case, contrast sensitivity depressed after two days taking 800 mg/d[3]. Duration of impaired vision was also different between the studies. Again, our patient did not exhibit decreased color vision or depressed contrast sensitivity. Compared to Hamburger et al. case, our patient did not exhibit a reduced N75/P100 amplitude. Gamulescu et al.[1] reported a case with optic neuritis, which lasted until two days after discontinuation of 1,200 mg ibuprofen/daily. This case was a 41-year-old male who complained about right-sided blurred vision and ocular pain during voluntary movements of the eyes or head. Vision was markedly reduced, there was a quadrant visual field defect, and absent response of visually-evoked potentials[1]. Visual disturbances associated with ibuprofen have also been reported in patients who received the drug over the counter[5]. Although the described cases indicate that some patients may develop ophthalmologic side effects, there are also studies on larger series of patients under ibuprofen for osteoarthritis, which could not find any ocular complications from the drug[6].

This case shows that high daily dosage of ibuprofen during one week may result in unilateral, transient lesion of the visual pathway. Withdrawal of ibuprofen may be followed by immediate recovery of the disturbed visual functions.

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