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Poppers toxic maculopathy misdiagnosed as atypical optic neuritis

P. Savary[a], D. Biotti[a,b,c], L. Abouaf[a,c], M. Bernard[a], F. Chaise[d], O. Guerrier[b], C. Tilikete[a,b,c] and A. Vighetto[a,b,c]

[a]*Department of Neuro-ophthalmology, Hôpital Neurologique Pierre Wertheimer, Lyon;* [b]*Department of Neurology, Hôpital Neurologique Pierre Wertheimer, Lyon;* [c]*Université de Lyon 1, Université Claude Bernard, Lyon; and* [d]*Department of Ophthalmology, Hôpital Fleyriat, Bourg en Bresse and Hôpital de la Croix Rousse, Lyon, France*

Correspondence: Dr Damien Biotti, Department of Neurology, Hôpital Neurologique Pierre Wertheimer, 59 boulevard Pinel, 69394 Lyon, France (tel.: +33 47 235 7882; fax: +33 47 235 7351; e-mail: damien.biotti@chu-lyon.fr).

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Sir,

Poppers are volatile nitrite oxide donors used as a recreational drug, mostly within the gay male community. Recently their use has spread outside this community. In France, up to 14% of young people under age 18 and 10% of the UK general population reported having already tried poppers [1]. A few cases of retinal toxicity have been reported [1–6].

Cases

Patient 1

A 30-year-old male was first admitted in November 2008 for a rapidly worsening painless decrease of vision in the right eye. Visual acuity (VA) was 20/200 in the right eye (OD) and 20/20 in the left eye (OS). Anterior segments and fundus examination were normal. Right visual field showed a caecocentral scotoma. Optical computed tomography (OCT) scan was considered normal. Neurological examination was otherwise unremarkable. Brain MRI was normal as was cerebrospinal fluid examination. Diagnosis of optic neuritis was suspected and high-dose steroids were given. The evolution was favourable with complete recovery obtained over a few months. In August 2012 he was addressed to our neuro-ophthalmological unit for a relapse. Eight days before admission he reported left eye central blue light phosphenes accompanied by blurred vision. VA was 20/20 in both eyes (OU) but left visual field showed temporal and superior scotoma. There was no relative afferent pupillary defect. Funduscopy and brain MRI remained non-contributive. Spectral domain OCT (SD-OCT) showed a limited foveal disruption of the signal in the inner segment/outer segment (IS/OS) junction of photoreceptors with hyper-reflecting signal in the outer nuclear layer (Fig. 1b). Multifocal ERG (mf-ERG) displayed mildly diminished central responses OS (Fig. 1c). A new reading of the 2008 OCT scan revealed a similar pattern in the previously affected eye (Fig. 1a). The diagnosis of optic neuritis was excluded and retinopathy was suspected. Thorough questioning revealed a long-term (before 2008) regular use of poppers (containing isobutyl nitrite). His consumption increased the week before the visual symptoms occurred with a different brand containing propyl nitrite. The diagnosis of poppers maculopathy was made. After a marked reduction of inhalation, over several weeks, visual symptoms, SD-OCT

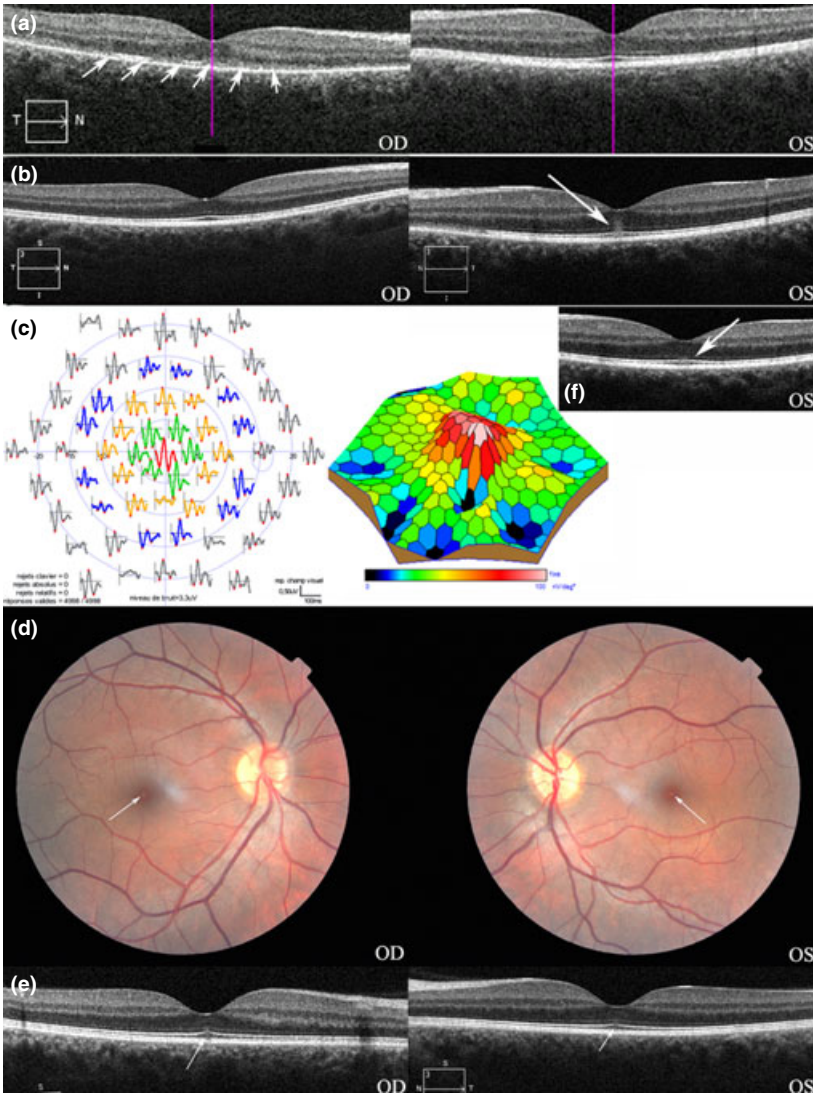

Figure 1 Patient 1: (a) 2008 OCT scan; (b) 2012 SD-OCT scan; (c) left eye multifocal ERG; (f) 2012 SD-OCT scan 1 month later. Patient 2: (d) funduscopy; (e) SD-OCT scan. OD, right eye; OS, left eye.

(Fig. 1f) and mf-ERG alterations improved.

Patient 2

A 39-year-old male was admitted in October 2012 because of bilateral severe painless central blurred vision occurring shortly after his first inhalations of poppers during the same night. Neurological examination and visual field were normal. VA was 20/50 OU; funduscopy revealed bilateral foveal yellow dots (Fig. 1d). SD-OCT showed a foveal IS/OS disruption (Fig. 1e) whilst mf-ERG remained normal. These features were suggestive of acute toxic poppers maculopathy. His VA increased shortly without any treatment, evaluated in November 2012 as between 20/25 and 20/20 OU, whereas funduscopy and SD-OCT remained unchanged.

Discussion

Although general toxicity of poppers has been reported previously, toxic maculopathy has appeared as an emerging entity [1,2,5]. Its recent description could be related to the most frequent use, in the last few years, of isopropyl nitrite rather than isobutyl nitrite [1,3]. The mechanisms of toxicity remain unclear with the hypotheses of a modulation of retinal cell phototransduction or of an increase in light toxicity susceptibility [2,5]. The existence of a chronic and/or an acute toxicity could also be debated [1,2]. Our first patient was a long-term consumer but with a recent increase in the frequency of inhalations with a new, and perhaps more toxic, brand of poppers; the second patient, however, was a real one-time user. The prevalence and evolution of the retinal toxicity remain uncertain. In our cases, the evolution was favourable, even if patient 1 continued using poppers.

Ophthalmological examination and SD-OCT images can corroborate poppers toxic maculopathy. Differential diagnoses include adult onset foveomacular vitelliform dystrophy and several dysimmune and photic maculopathies [1]. If ophthalmologists are now more frequently aware of this specific macular toxicity neurologists are not, and some patients are referred to them for the evaluation of optic neuropathy. This situation could easily lead to misdiagnoses, inappropriate use of ancillary tests and maintenance of poisoning.

Disclosure of conflict of interest

The authors have nothing to disclose.

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