DIDACTIC IMAGE

POPPERS MACULOPATHY

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ABSTRACT

We describe a case of toxic maculopathy caused by unique inhalation of poppers. This maculopathy has spontaneously resolved.

KEY-WORDS

maculopathy, poppers

CASE REPORT

A 45 year-old male patient presented with a painless bilateral decreased visual acuity accompanied with central photopsias since he woke up 24 hours earlier. He suffered no ocular pain and described photopsias and a central scotoma. During anamnesis, he reported inhalation of poppers last night, 12 hours before examination. This was his first intake of poppers. The patient had no ocular history. He reported oxycodone intake for fist fracture a few days ago and confessed regular alcohol and tobacco consumption. At the examination, best corrected visual acuity was 7/10 in the right eye and 8/10 in the left eye. Near vision remained unchanged with Parinaud 2 in both eyes with a +1.5D addition.

Biomicroscopy showed no particularity. Intraocular pressure was normal in both eyes. Funduscopy showed a bilateral yellow foveal spot.

Spectral Domain Optic Coherence Tomography (OCT) revealed bilateral disruption at the junction of inner and outer segments of photoreceptors in the fovea. Visual Field Testing, Fluoangiography and Electroretinography (ERG) were within normal limits.

The visual acuity spontaneously recovered to 10/10 in both eyes over a period of 4 weeks, with complete resolution of the foveal yellow spot. Disruption of the external segment of foveal photoreceptors lasted for 3 months.

DISCUSSION

Poppers are isopropyl- or alkyle-nitrites firstly used in treatment of angor due to vasodilator action by nitric oxyde (NO) release (1). Since the 1970's, poppers' consumption has increased, especially in the gay-male community where it is used for its sexual action (ampli-

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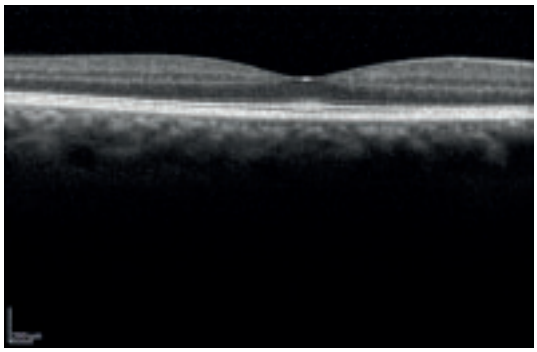
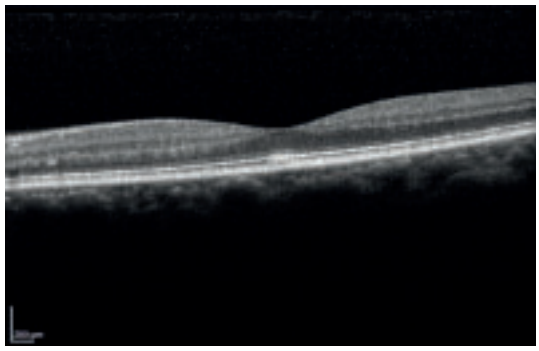

Fig. 1 & 2: OCT Spectral domain showing disruption at the junction of inner and outer segments of foveal photoreceptors during the acute phase.

fication of orgasmic sensations). Up to 47 % of gay male confess poppers consumption during the past 12 months (1). More recently, poppers have been used for their euphoric action and their apparent safety, particularly among teenagers. Epidemiological studies show that experimentation by 17 year- teenagers of France has risen from 2,4% in 2000 to 13,7% in 2008. (2) Poppers can be bought without any medical prescription on line, in sex-shops or in sauna clubs (1,3).

First cases of poppers' maculopathy have been described in 2004 (4). More recent series permitted to describe its main specifications. Visual acuity is variably decreased (from 5/10 to 9/10)(3), with central scotoma and/or photopsias in 50 % of cases (5). Visual disturbance is usually bilateral. Funduscopy shows a yellow foveal spot and Fluoangiography can be normal or show window effect without any dye diffusion.

Visual field testing, Colour Vision and ERG are within normal limits. The most useful examination is OCT and especially Spectral Domain OCT due to its high resolution. The main sign is a disruption at the junction of inner and outer segments of photoreceptors (6, 7).

Maculopathy is more frequent and severe in cases of repeated intake of poppers (3). A recent prospective study showed prevalence of 56 % in habitual consumers (8) whereas in-

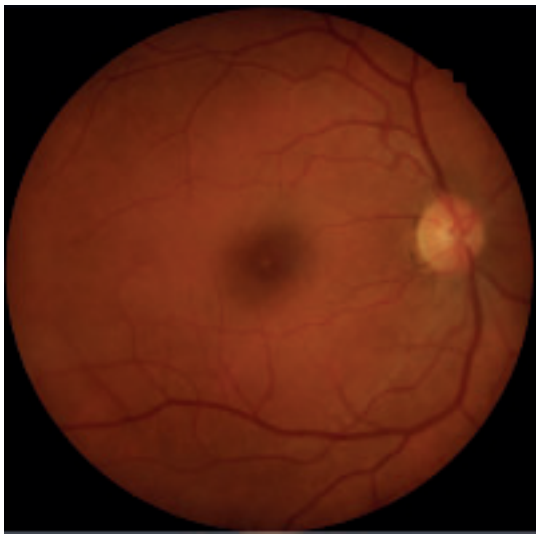


Fig. 3 & 4: Bilateral foveal yellow spot during the acute phase.

frequent cases have been described in occasional consumers. (9) Treatment consists in intake cessation. Evolution is usually good when the drug is ceased, with complete recovery of visual acuity and restoration of fundus and OCT abnormalities.

Several hypotheses exist to explain the mechanism of foveal toxicity. On one hand, NO modulates metabolism and function of photoreceptors, essentially by induction of guanylate cyclase, a key enzyme of phototransduction of the outer part of photoreceptors (most of cases reported photopsias, suggesting activation of foveal cones rather than inhibition). On the other hand, NO could potentiate photic injury of photoreceptors as foveal lesion in poppers maculopathy evokes light induced lesions (however, no patient reported having stared at light). Third hypothesis consists in modification of retinal perfusion due to NO release (6, 7, 9).

The composition of poppers could be involved in rise of this pathology since legal interdiction of amyl- and butyl-nitrites in 2007 lead to use of isopropyl nitrites, while most of the cases have been reported for the last four years. (7,9) The type of nitrite inhaled in our case has not been determined.

CONCLUSION

Consumers and ophthalmologists should be aware of the possible toxicity of poppers.

In this case report, maculopathy occurred after a single drug intake, which is less frequent. In patients with recent bilateral loss of visual acuity and phosphenes, this diagnosis should be considered. Finally, research of the molecular basis for the toxic effects of poppers may be of interest for further documentation the role of nitric oxide in retinal function and diseases.

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