CASE REPORT

Poppers retinopathy

Joshua Luis, Meena Virdi, Shahriar Nabili

Department of Ophthalmology,
Hairmyres Hospital, East
Kilbride, UK

Correspondence to
Dr Joshua Luis,
joshua.luis@nhs.net

Accepted 9 February 2016

SUMMARY

We present a case of a 52-year-old man with sudden, bilateral central loss of vision as a result of inhalation of 'poppers'. He was found to have characteristic changes on optical coherence tomography. With conservative treatment, the patient's vision improved marginally at 3 months follow-up. An overview of previous published cases is also included.

BACKGROUND

'Poppers' are a group of alkyl nitrite chemicals. They cause euphoria, sexual arousal and relaxation of smooth muscles including the anal sphincter. As a result, they are particularly popular in the gay partying community. Numerous recent reports have associated the use of poppers with disruption in vision, we present such a case in a 52-year-old man.

CASE PRESENTATION

A 52-year-old bisexual man presented to the ophthalmology acute referral clinic with a 10-day history of central visual blurring and metamorphopsia. He reported normal peripheral vision, and had no other visual symptoms of note. The deterioration was noted immediately following a night of clubbing, during which time the patient inhaled 'poppers' for the first time. He was HIV negative and systemically well.

Slit-lamp examination was unremarkable, with normal fundal views. His best corrected visual acuity was 6/15 in the left eye and 6/12 in the right, improving to 6/12 and 6/9.5, respectively, with pinhole. His pupil reactions and colour vision were normal. Spectral domain optical coherence tomography (SD-OCT) showed disruption of the inner and outer segment layers, confined to the fovea. These findings were identical in both eyes (figure 1).

The patient was treated conservatively, with advice regarding cessation of drug use. At 3 months follow-up, the patient's best corrected visual acuity improved marginally to 6/9.5 bilaterally. OCT showed improvement in the photoreceptor layer, although some mild changes in the foveal area remained (figure 2).

DIFFERENTIAL DIAGNOSIS

Differential diagnoses for poppers retinopathy include photic injury, central serous retinopathy and vitreoretinal traction. Photic injury can generally be differentiated by history, while other conditions are all very unlikely to present symmetrically. This therefore highlights the importance of relevant drug history and examining both eyes.

Figure 1 Spectral domain OCT on presentation, showing symmetrical disruption of the inner/outer segment layers (red arrows) top—right eye, bottom—left eye. OCT, optical coherence tomography.

DISCUSSION

Alkyl nitrites, colloquially known as 'poppers', are recreational substances frequently used in the clubbing community due to their euphoric effects. They also cause sexual arousal and smooth muscle relaxation, being therefore especially popular among the homosexual population.¹ Poppers are not controlled under the Misuse of Drugs Act² and are therefore readily available from a variety of sources.

Despite the high prevalence of poppers, there have only been around 30 published cases of poppers retinopathy/maculopathy. The actual incidence is likely to be much higher, although the majority of these are asymptomatic.³ All cases present with bilaterally symmetrical central field loss or distortion, with preservation of peripheral fields. Other symptoms such as loss in colour vision, photopsias and positive scotomas are more variable.^{4–6}

SD-OCT provides the most valuable diagnostic test, showing pathognomonic disruption of the inner and outer segment layers in both foveae.^{7–9} Fundus fluorescein angiograms (FFAs), when carried out, are invariably normal.

The SD-OCT findings are similar to those observed in photic injury.¹⁰ However, some recent cases have shown abnormalities in full-field

Figure 2 Improvement at 3 months follow-up.

To cite: Luis J, Virdi M, Nabili S. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2016-214442

electroretinography.⁵ This supports the presence of diffuse retinal damage, and is not limited to the maculae as previously thought. The current proposed mechanism of injury for poppers is that of free radical release from the nitrite chemicals.^{3 11} As a consequence, these studies advocate the use of the term 'poppers retinopathy' over 'poppers maculopathy'.¹²

In poppers retinopathy, disease progression is successfully halted following abstinence from the substance in all cases. Recovery is variable, with some patients achieving complete resolution while others experience no improvement. There is no current proven therapy, however, there are reports of oral lutein therapy, which may be of benefit.⁶ The incidence of poppers retinopathy does not appear to be dose related,¹³ furthermore, there is no current evidence to suggest that patient demographics or HIV status have any influence.

At the time of writing, the 'Psychoactive Substances Bill' is at the report stage during its progress through the House of Commons. This new set of legislations has the intention of tigh-

tening control over substances similar to and including poppers, in the UK.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Gruener AM, Jeffries MA, El Housseini Z, *et al.* Poppers maculopathy. *Lancet* 2014;384:1606.
- 2 Davies AJ, Kelly SP, Naylor SG, *et al.* Adverse ophthalmic reaction in poppers users: case series of 'poppers maculopathy'. *Eye (Lond)* 2012;26:1479–86.
- 3 Schulze-Döbold C, Ben Denoun M, Dupas B, *et al.* Retinal toxicity in users of "poppers." *Ann Intern Med* 2012;156(9):670–2.
- 4 Audo I, El Sanharawi M, Vignal-Clermont C, *et al.* Foveal damage in habitual poppers users. *Arch Ophthalmol* 2011;129:703–8.
- 5 Savary P, Biotti D, Abouaf L, *et al.* Poppers toxic maculopathy misdiagnosed as atypical optic neuritis. *Eur J Neurol* 2013;20:e90–1.
- 6 Pahlitzsch M, Draghici S, Mehrinfar BM. [Poppers-associated maculopathy]. *Klin Monbl Augenheilkd* 2013;230:727–32.
- 7 Asensio-Sánchez VM, Gonzalez-Buendia L, Marcos-Fernández M. Maculopathy due to drug inhalation. *Arch Soc Esp Ophthalmol* 2014;89:313–15.
- 8 Bruninx R, Lepiepe G. Didactic image poppers maculopathy. *Bull Soc Belge Ophtalmol* 2013(322):133–5.
- 9 Rabot A, Pinon F, Baillif S. [SD-OCT appearance in acute poppers-associated macular toxicity]. *J Fr Ophtalmol* 2013;36:388–9.
- 10 Fajgenbaum MA. Is the mechanism of 'poppers maculopathy' photic injury? *Eye (Lond)* 2013;27:1420–1.
- 11 Vignal-Clermont C, Audo I, Sahel JA, *et al.* Poppers-associated retinal toxicity. *N Engl J Med* 2010;363:1583–5.
- 12 Clemens CR, Alten F, Loos D, *et al.* Poppers maculopathy or retinopathy? *Eye (Lond)* 2015;29:148–9.
- 13 Davies AJ, Kelly SP, Bhatt PR. 'Poppers maculopathy'—an emerging ophthalmic reaction to recreational substance abuse. *Eye (Lond)* 2012;26:888.

Learning points

- ▶ Drug and sexual history can be of crucial importance in the investigation of visual disturbances.
- ▶ Poppers retinopathy presents as bilateral, symmetrical, central visual disturbances.
- ▶ Stopping the usage of poppers terminates worsening of symptoms, however, recovery is variable.

Copyright 2016 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow