What’s That I Smell?

Manjot K. Gill, MD
Associate Professor of Ophthalmology
Director of Vitreoretinal Fellowships

Cole Rojas, MD
No relevant financial disclosures
Summary

• Poppers use is relatively common, very common amongst MSM
• Can lead to significant reduction in vision
• OCT findings are the most reliable finding, sometimes the only finding
• AOSLO shows definite photoreceptor loss in the macula, especially in the fovea
• Enhancing public awareness and recognition is critical
Case History

• 40 yo HIV+ male presents with 6 month history blurry vision
• PMHx: HIV+, anxiety
• Medications: Genvoya, Lexipro, Abilify
• POHx: Non-contributory
• ROS: Non-contributory
• SHx: Choreographer, long term relationship with male partner, uses marijuana and ETOH moderately
### Physical Exam

- **BCVA:** 20/40, 20/50
- **Pupils:** reactive, no APD
- **IOP:** WNL
- **SLE:** WNL
- **Fundus Exam:**

<table>
<thead>
<tr>
<th></th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disc</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>C/D Ratio</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Macula</td>
<td>Normal, No edema</td>
<td>Normal, No edema</td>
</tr>
<tr>
<td>Vessels</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Periphery</td>
<td>area of chorioretinal atrophy at 9 o clock with operculum</td>
<td>pigmentary changes inferiorly, chorioretinal scar ST</td>
</tr>
</tbody>
</table>
Fundus Photos
What is going on?

• DDx is limited, not many things look this

• One extra question from the history confirms the diagnosis
  - *Do you use poppers?* “Every day for many years”
What are poppers?

- Colloquialism used to describe a class of drugs known as alkyl nitrates or volatile nitric oxide

- Recreational drugs used for their psychoactive effects and are particularly common among men having sex with men (MSM) because of their ability to induce euphoria and myorelaxation
How popular are poppers?

One study revealed popper use among the general population in the UK, Australia, USA and Eurozone was around 7.6% within the past year, whereas a study in Ireland showed that 35% of MSM have used poppers in the same period.
Poppers Maculopathy

- Rare maculopathy that is poorly understood with yellow foveal discoloration and disruption of the outer segments of foveal photoreceptors

- Presents with bilateral central vision blurring that can present over the course of days to months

- Damage appears to be confined to the photoreceptors

- Abnormalities of the ellipsoid layer most common feature on OCT
Poppers Maculopathy

https://www.thelancet.com/article/S0140-6736(14)60887-4/fulltext
Poppers Maculopathy

https://www.nature.com/articles/eye2013218.pdf
Poppers Maculopathy

Mechanism of action:
- alkyl nitrates may be directly toxic to photoreceptors
- alkyl nitrates make photoreceptors more susceptible to photopic damage explaining the similarity in appearance to solar retinopathy
- poppers may disrupt blood flow to the photoreceptors via vasodilation

Some have suggested decreased signal on ERG may indicate a more widespread retinopathy
Back to our case: We used AOSLO to look at our patient

Healthy Control Patient

Note central high density of cones that is seen in a healthy control.
Back to our case: We used AOSLO to look at our patient.

AOSLO reveals extensive damage to the central cones of both eyes. The central dark elliptical zone denotes an area with absent cone outer segment signal. This is surrounded by normal reflecting outer segments in the perifovea.
Poppers Maculopathy

Prognosis poorly understood given the paucity of cases with long term follow-up.
- Case series in 2014, Pahlitzsch et al showed only 1/3 patients recovering VA following initial presentation.
- Case series by Hui et al (Retina, 2020) showed complete recovery of VA/OCT findings in one patient at 3 year follow-up after ceasing popper use.
Poppers Maculopathy

Figure 2  Optical coherence tomography (OCT) images at presentation (A and B) and 1-year follow-up (C and D), showing complete resolution (case 4). O.D., oculus dexter (right eye); O.S., oculus sinister (left eye).

Poppers: legal highs with questionable contents? A case series of poppers maculopathy
Rewbury, Rebecca ; Hughes, Edward ; Purbrick, Robert ; Prior, Stephen ; Baron, Mark
Conclusion

• Consider poppers maculopathy in differential diagnosis of subfoveal loss of EL on OCT
• Our case is the first to image the retina in Poppers maculopathy using newer AOSLO technology demonstrating significant central loss of cones supporting a more focal maculopathy.
• Poppers maculopathy may show complete resolution of signs on long-term follow-up, even after chronic popper ingestion.
• Enhancing public awareness and recognition is critical
References