

## Marijuana and Glaucoma: A Shifting Landscape

**M**edical marijuana has been legalized in 37 U.S. states, and recreational cannabis is legal in 18. Most recently, a bill decriminalizing the drug has passed in the U.S. House of Representatives and is now in the Senate.<sup>1</sup> Considering evolving societal norms and given that marijuana has been shown to modestly decrease IOP in several studies—a finding that’s promoted on social media—it may not be surprising that patients are asking their ophthalmologists about the drug’s use in the treatment of glaucoma.

That’s certainly the case for Daniel Lee, MD, at Wills Eye Hospital in Philadelphia, who said that he routinely fields marijuana-related questions. “I’ve even had elderly women—patients in their 80s and 90s—ask about marijuana as a treatment option.” A diverse set of patients is looking at marijuana as a potential treatment, and this is spurred on by media coverage and because some patients have issues with their current treatment, he said.

Dr. Lee’s experience mirrors results of a recent survey of American Glaucoma Society (AGS) members. It found that 38% of respondents reported at least one patient inquiry per week about medical marijuana for treatment of glaucoma, 37% of respondents have patients who use marijuana for their glaucoma, and 55% of respondents report that patients have specifically requested

a prescription.<sup>2</sup>

What concerns Dr. Lee about the uptick in interest in marijuana is the dearth of scientific literature showing a concrete benefit to smoking, ingesting, or applying cannabis topically. “There isn’t a lot of evidence to

support the effectiveness of medicinal marijuana for glaucoma,” he said. In fact, because evidence is scarce, the Academy, the AGS, and the Canadian Ophthalmological Society all advise against the use of marijuana for the treatment of glaucoma.

Dr. Lee pointed out a conundrum in the ophthalmological community: while increasing numbers of patients explore marijuana as a treatment for glaucoma, cannabis isn’t recommended for its treatment by medical societies. So how should glaucoma specialists handle this situation?

### **Evidence, Attitudes, Practice**

**Scant evidence.** Guidance from the Academy and other eye societies is based on decades of literature about the effects



**IN PRACTICE.** As glaucoma patients increasingly ask about marijuana, ophthalmologists must find the right balance.

of marijuana on IOP, which has yielded little support for the drug. After studies in the 1970s found an IOP-lowering effect for smoking cannabis, further studies provided more data. For example, a 1980 study showed that smoking marijuana lowered IOP by approximately 25% in study participants, with the effect dissipating after three or four hours.<sup>3</sup> And other studies have had similar findings.

“A major problem is that the IOP-lowering effect doesn’t last long enough [to be therapeutic]; three to four hours seems to be the duration of action that’s quoted in most of these studies,” said Dr. Lee. “Glaucoma is a chronic disease that requires around-the-clock pressure control.”

More recently, a prospective, observational study bolstered the argument against smoking marijuana. It showed that although smoking cannabis may decrease mean IOP, it accelerates onset

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BY ANNA SHARRATT, CONTRIBUTING WRITER, INTERVIEWING HENRY D. JAMPEL, MD, MHS, MONA KALEEM, MD, DANIEL LEE, MD, AND LEONARD K. SEIBOLD, MD.

of glaucoma. Subjects who smoked many times (more than 100 times) and those who smoked frequently (every day) developed glaucoma at a younger age than did nonsmokers and those who smoked fewer times and/or less frequently.<sup>4</sup>

**Topicals.** Studies on eyedrops haven't been encouraging either. A review article<sup>5</sup> looking at several small studies found that topical tetrahydrocannabinol (THC) as well as THC-cannabidiol (CBD) drops failed to lower IOP; and a synthetic cannabinoid receptor antagonist showed an IOP lowering effect, which dissipated after two hours. "Those [studies] haven't shown much effect at all," said Leonard K. Seibold, MD, at Sue Anschutz-Rodgers Eye Center in Aurora, Colorado. "It's very hard for the active compounds from marijuana to penetrate the eye."

**Societal influences.** On the other side of ophthalmologists' conundrum: acceptance of the drug among U.S. adults more than doubled from 2000-2019, according to a Pew Research survey.<sup>6</sup> Moreover, for glaucoma patients, said Dr. Lee, "many voices on social media tout the benefit of marijuana."

He and several other physicians recently conducted a study on this phenomenon.<sup>7</sup> They found that a significant portion of the online material that they evaluated on Google, YouTube, and Facebook promoted cannabis use by glaucoma patients.

In this climate, the survey of AGS members found that 27% of respondents indicated that there may be a role for marijuana in glaucoma management.<sup>2</sup>

**Evolving practices.** Dr. Lee isn't surprised. "My approach has changed," he said. Although he doesn't prescribe marijuana, he's more receptive to dialogue on the topic.

Dr. Seibold added that his patients frequently ask about marijuana, especially those who have problems tolerating topical medications due to side effects, who are worried about risks of laser procedures and surgery, or who have had complications. "It's usually patients who have concerns about their current treatment," he said. "They want to explore."

While Dr. Seibold doesn't recommend marijuana to patients due to a lack of long-term data on its safety and

significant side effects, he has a few patients who use marijuana from time to time. "They have the perception it is helping their glaucoma," he said.

**Role of standard therapies.** Provided that patients adhere to standard treatments and are aware of the side effects, Dr. Seibold said that he generally doesn't interfere with his patients trying marijuana. As a case in point, one patient who was apprehensive about undergoing trabeculectomy wanted to try marijuana first. He found a transdermal patch at a local dispensary and used it with limited success. His IOP decreased for about a month, but then the effect wore off and the patient's tolerance to marijuana increased—and he ended up undergoing surgery after all.

Dr. Seibold said that there might be a place for marijuana in the future. If cannabis were to be proven effective and safe for treatment of glaucoma—and legal in their states—some ophthalmologists may be open prescribing it, he said.

## Keep Downsides in Mind

**Side effects.** Despite the drug's increasing acceptance in the United States, marijuana is by no means benign, cautioned Dr. Seibold. Among marijuana's side effects are increased heart rate, decreased blood pressure, lowered immune response, impaired concentration, decreased motor coordination, lung damage, and more.<sup>8</sup> "It can cause dizziness, and many of my patients are at fall risk," Dr. Seibold said.

**Blood pressure.** Henry D. Jampel, MD, MHS, at Wilmer Eye Institute in Baltimore, also highlighted a concern about marijuana's possible impairment of blood flow to the optic nerve. In an AGS position statement,<sup>9</sup> he wrote, "As marijuana given systemically is known to lower blood pressure, it is possible that such an effect could be deleterious to the optic nerve in glaucoma, possibly reducing or eliminating whatever beneficial effect that is conferred by lowering IOP." In fact, earlier this year, a population-based study confirmed that lower blood pressure is an independent risk factor for glaucoma progression.<sup>10</sup>

**Risk of abandoning standard therapy.** Another concern is related to the

## Marijuana: Its Two Main Components

The two major active components of marijuana are CBD and THC. THC produces the mental status changes associated with using cannabis. Conversely, CBD is not psychoactive and is used to treat neurological conditions such as Dravet Syndrome, a severe form of epilepsy.

In a 2019 editorial, Dr. Jampel commented on these two components.<sup>1</sup>

**Downsides.** When it comes to glaucoma, CBD, unlike THC, does not appear to lower IOP. In fact, Dr. Jampel wrote that some studies seem to indicate that cannabidiol can raise IOP. As for THC, its downsides are psychoactivity, short duration of effect, and the ability of patients to build a tolerance to it.

**Upsides.** Animal studies have found that both CBD and THC may have a neuroprotective effect. If this effect were to bear out, Dr. Jampel stated that CBD "may help prevent degeneration of the optic nerve not related to IOP when used with IOP-lowering therapies." And THC derivatives could provide "a double attack on glaucoma" by lowering IOP and being neuroprotective of the retinal ganglion cells. But, he noted, much more study is needed.

**A caveat.** As for THC, its usefulness in glaucoma treatments also necessitates further study. That's because the concentration of THC in marijuana has increased dramatically during the last few decades, from 2%-3% about 30 years ago to as high as 33% now. This reality could potentially change the outcomes of future studies evaluating marijuana's effectiveness in treating glaucoma, said Dr. Jampel.

1 Pujari R, Jampel H. *Ophthalmol Glaucoma*. 2019;2(4):201-203.

appeal of the drug, said Dr. Lee. Several of his patients with severe glaucoma have, over the years, tried cannabis in lieu of traditional treatment. One of these patients, who stopped taking his medications, returned several years later with significant progression, he said.

### How to Communicate With Patients About Marijuana

Dr. Lee is waiting for a definitive study on the benefits of marijuana before he considers prescribing it to his glaucoma patients. In the meantime, however, he's carefully addressing the issue.

**Build trust, be approachable.** "My approach has somewhat changed. Taking a strong stance against medical marijuana may inadvertently alienate those who need the most help. I try to take a softer approach as a patient educator and guide," said Dr. Lee.

Mona Kaleem, MD, at Johns Hopkins Medical Institute in Baltimore, agreed. "A lot of my patients say, 'Just to let you know, I do smoke [marijuana],' she said. "I think my nonjudgmental approach helps patients open up." When they do start to talk, Dr. Kaleem takes the opportunity to educate them about marijuana. "The patient-physician relationship is very important here."

Dr. Seibold also pointed out that patient-physician dialogue will improve as the stigma around marijuana ebbs with increased legalization.

**Offer evidence.** Dr. Lee said that ophthalmologists must be careful about how they talk to patients. "I usually say 'Hey, I'm not necessarily antimarijuana in general—but for glaucoma I am.'" He said that it's important to explain why marijuana doesn't work while focusing on therapies that do, such as eyedrops and laser procedures.

**Stay in the loop.** Dr. Kaleem said that a big problem is that, in states where marijuana is licensed, patients can buy cannabis almost anywhere without an ophthalmologist's prescription. Or they can buy it online. She noted that two Jamaican cannabis-containing eyedrops, Canasol and Cantimol, have been in existence since the 1980s but have not been proved at all useful. She said it's key that ophthalmologists be aware of the variety

of products in order to have educated conversations with patients and dispel misinformation.

**Educate patients.** "The truth is most of our patients are not turning to academic journals to get their information. The messaging has to go out there in a way that speaks to the audience," said Dr. Lee. To this end, the authors of the AGS member survey study created a handout for patients to guide them to reputable sources, such as the Academy and the AGS. (To download the handout, find this article at [aao.org/eyenet](http://aao.org/eyenet).)

- 1 [www.congress.gov/bill/117th-congress/house-bill/3617](http://www.congress.gov/bill/117th-congress/house-bill/3617).
- 2 Bergman Z et al. *J Glaucoma*. 2022;31(2):67-71.
- 3 Merritt C et al. *Ophthalmology*. 1980;87(3):222-228.
- 4 Lehrer S, Rheinstein PH. *J Fr Ophtalmol*. Published online Jan. 26, 2022.
- 5 Passani A et al. *J Clin Med*. 2020;9(12):3978.
- 6 [www.pewresearch.org/fact-tank/2021/04/16/americans-overwhelmingly-say-marijuana-should-be-legal-for-recreational-or-medical-use/](http://www.pewresearch.org/fact-tank/2021/04/16/americans-overwhelmingly-say-marijuana-should-be-legal-for-recreational-or-medical-use/).
- 7 Jia J et al. *Ophthalmol Glaucoma*. 2021;4(4):400-404.
- 8 [aao.org/complimentary-therapy-assessment/marijuana-in-treatment-of-glaucoma-cta--may-2003](http://aao.org/complimentary-therapy-assessment/marijuana-in-treatment-of-glaucoma-cta--may-2003).
- 9 Jampel H. *J Glaucoma*. 2010;19(2):75-76.
- 10 Jammal AA et al. *Ophthalmology*. 2022;129(2):161-170.

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**MORE ONLINE.** See the Academy patient education infographics on this topic at [aao.org/eye-health/tips-prevention/marijuana-glaucoma-infographic](http://aao.org/eye-health/tips-prevention/marijuana-glaucoma-infographic), and share them on social media.

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