

Treating Glaucoma During Pregnancy

Preserving patients' vision is becoming increasingly important with advancing maternal age.

BY TERRI PICKERING, MD

Traditionally, we glaucoma specialists have infrequently encountered issues that can complicate the treatment of pregnant glaucoma patients, because most of the women we treat are past childbearing age. This situation is changing¹ as advances in reproductive technology allow women to conceive at increasingly older ages. We are also detecting glaucoma and identifying glaucoma suspects at younger ages due to the availability of new diagnostic tools and an increased clinical awareness of the disease. This article describes the challenges inherent in treating pregnant glaucoma patients and discusses how to minimize the risk to the fetus while preserving the mother's vision.

PERCEIVED RISK

The treatment of glaucoma during pregnancy is complicated by patients' perception that the hypotensive drugs they use to control their IOP are teratogenic.² Even when they are exposed to medicines that are known to be safe, pregnant women think that their unborn children have a 24% risk of developing birth defects.

Women who are 35 years old or older are routinely informed that their age increases their baby's risk of birth defects, and they thus may be more concerned than younger patient about decreasing the risk associated with any medications. In some cases, patients are so reluctant to take medications while they are pregnant that the rate of nonadherence increases, with some of them discontinuing the use of all drugs.³ In reality, most known teratogenic drugs increase the risk of major birth defects by only 1% to 3%.⁴

CHANGES IN IOP DURING PREGNANCY

The small risk of birth defects combined with patients' fears make it tempting to put glaucoma treatment on hold during pregnancy. In fact, common wisdom suggests that glaucoma stabilizes during preg-

"Because the course of glaucoma during pregnancy is highly variable, pregnant women should be monitored closely for changes in IOP and visual field loss."

nancy and that patients therefore may not need treatment.⁵ Studies of healthy women and those with ocular hypertension show that IOP decreases as pregnancy progresses, and research demonstrates a statistically significant drop in pressure from the first to the third trimester.⁶ Proposed causes for this decrease in IOP include an increase in outflow facility, a decrease in episcleral venous pressure, and the development of a mild metabolic acidosis.⁷

The studies showing an association between pregnancy and lower IOPs, however, did not include pregnant women who had glaucoma. In addition, no large studies have evaluated IOP in pregnant glaucoma patients. The largest such trial is a retrospective case series from Harvard Medical School that reviewed 28 eyes of 15 pregnant women with preexisting glaucoma.⁸ Thirteen of 15 patients used glaucoma medications (beta-blockers, alpha-agonists, cholinergics, and topical carbonic anhydrase inhibitors [CAIs]) while they were pregnant. The investigators found that 57% of the eyes had stable IOPs and visual fields during pregnancy. In 18% of eyes, IOP increased, but visual fields remained stable. Finally, 18% of eyes experienced progressive visual field loss with stable or elevated IOPs. Although patients who experienced changes in IOP required additional hypotensive medications, none of them required surgical intervention. This study shows that the course of glaucoma during pregnancy is highly variable, and it confirms that pregnant women

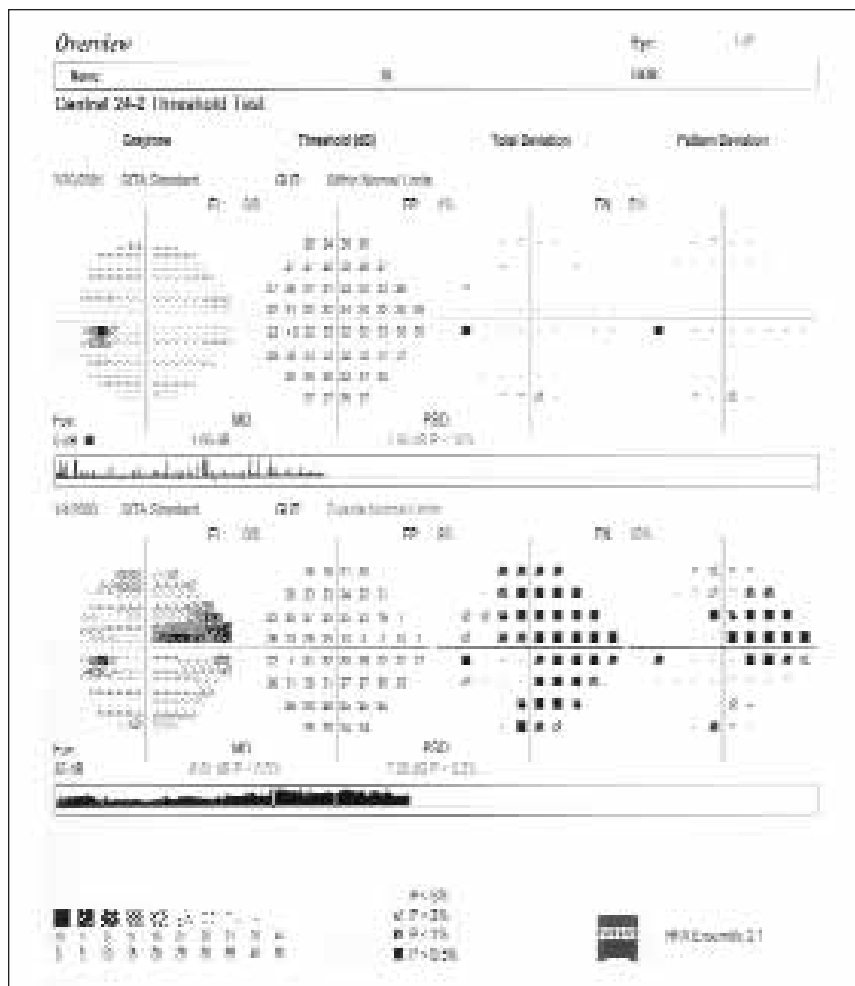


Figure 1. Visual field testing of the patient's left eye showed that she had developed a new nasal defect since 2001.

should be monitored closely for changes in IOP and visual field loss.

CASE REPORT

As the following case report shows, we glaucoma specialists can no longer assume that glaucoma improves or stabilizes during pregnancy.

A 28-year-old Asian American female physician whose juvenile glaucoma had been controlled with latanoprost for 5 years became concerned about continuing treatment with the prostaglandin analogue when she discovered she was pregnant. After the patient was switched to topical timolol, her IOP increased. Because she wanted to avoid surgery, she was once again started on latanoprost. Her IOP increased to 30 mm Hg on this regimen, and she underwent testing to determine if she needed additional treatment. Unfortunately, the patient had developed a new visual

field defect in her left eye (Figure 1) that was confirmed with optical coherence tomography (Figure 2).

Despite treatment with Cosopt (dorzolamide hydrochloride-timolol maleate; Merck & Co., Inc., Whitehouse Station, NJ), the patient's IOP remained high. She also failed to respond to a laser trabeculoplasty, and her IOP remained elevated at 25 mm Hg. This patient was opposed to trabeculectomy, because she was concerned that the use of general anesthesia and intraoperative antimetabolites could adversely affect the fetus. She therefore underwent trabeculectomy with retrobulbar anesthesia and without the application of an antimetabolite. Much to everyone's relief, the patient's postoperative IOP stabilized at 10 mm Hg, and she delivered a healthy baby.

PRINCIPLES OF DRUG THERAPY DURING PREGNANCY

We can prescribe only a limited number of IOP-lowering drugs to pregnant patients. The FDA has not classified any of

the drugs we use to treat glaucoma as pregnancy category A agents.⁷ This designation comprises drugs tested in controlled human studies that show no risk to the fetus in the first trimester and have an overall low risk of causing fetal harm. Because most glaucoma drugs (ie, beta-blockers, prostaglandin analogues, CAs [both topical and systemic], cholinergics, anticholinesterases, and apraclonidine)⁸ are considered category C agents by the FDA (ie, animal studies have shown adverse side effects on the fetus, no controlled studies in women), physicians are usually limited to treating patients with the category B drugs of brimonidine and dipivefrin. Category B drugs show no risk to the fetus in animal studies, and the adverse side effects seen in animal studies are not confirmed in pregnant women.

We should avoid treating pregnant patients with category C drugs unless the potential benefit for the

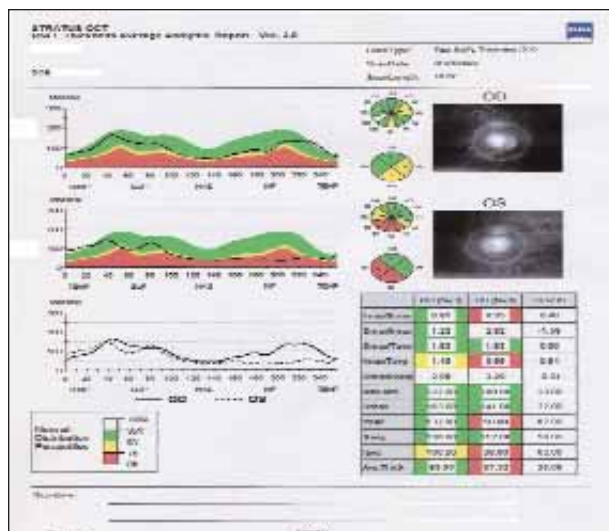


Figure 2. Optical coherence tomography of the patient's left eye showed degenerative changes in the inferotemporal portion of the optic nerve. These changes correspond to the superonasal visual field defect shown in Figure 1.

patient justifies the risk to the fetus. A soft exception to this rule is the use of beta-blockers. Although ophthalmologists may be reluctant to prescribe this class of drugs to pregnant glaucoma patients, obstetricians are most comfortable with this type of therapy, because they prescribe oral beta-blockers to control hypertension during pregnancy.⁸ Even this class of drugs must be used carefully, however, because topical timolol has been associated with fetal and neonatal bradycardia and arrhythmia.^{7,8}

Glaucoma patients may also be able to use topical CAs safely during pregnancy. The literature contains no reports of any adverse effects from this class of drugs, but oral formulations (methazolamide and acetazolamide) have been associated with sacroccygeal teratoma and transient renal tubular acidosis.⁹ Women who are near term should avoid cholinergic drops, because these drugs have been associated with hyperthermia, restlessness, seizures, and diaphoresis in neonates. Despite its status as a category B drug, bromonidine is also contraindicated in women who are near term. Bromonidine has been associated with bradycardia, apnea, and unresponsiveness in neonates and children.¹⁰

Surprisingly, prostaglandin analogues may be considered safe for use during pregnancy, but the jury is still out. Physicians usually avoid this class of drugs, because it is similar to oxytocin, an agent used to induce labor. In an observational study of 11 pregnant women exposed to latanoprost for various lengths of time, how-

ever, investigators found no evidence that the drug posed a risk to the fetus or the course of pregnancy.¹¹

CONCLUSION

Ophthalmologists seeking guidance on treating pregnant glaucoma patients can refer to various books (eg, the *Physician's Desk Reference*¹²), Web sites (including the teratogen information system,¹³ the breast-feeding department of the University of California, San Diego,¹⁴ Motherisk,¹⁵ and the Reproductive Toxicology Center¹⁶), and, of course, patients and their obstetricians.

Ideally, we should discuss alternatives to topical hypotensive drugs with patients before they become pregnant. With advanced planning, glaucoma patients can undergo surgery (eg, laser trabeculoplasty) in anticipation of decreasing or discontinuing their use of eye drops. In addition, patients who continue to use eye drops during pregnancy should practice punctal occlusion to decrease the systemic absorption of glaucoma drugs. One hopes that this measure can keep the amount of drug to which the fetus is exposed too low to cause a birth defect. □

Case report provided by Andrew G. Iwach, MD.

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