

Ocular Changes During Pregnancy

BY ALBERT CHEUNG AND INGRID U. SCOTT, MD, MPH
EDITED BY SHARON FEKRAT, MD

Ocular manifestations of pregnancy can be grouped into three categories: physiologic changes, pregnancy-specific eye disease, and modifications of preexisting eye disease. Although the range of possible pregnancy-associated ocular changes is broad, many of these conditions resolve during the postpartum period. Management may involve watching benign findings, referring the patient to another specialist, and undertaking medical or surgical treatment.

Although not an exhaustive review, the following highlights several examples in each of the three categories.

Physiologic Changes

Corneal changes. Physiologic changes that affect the cornea and are most likely due to water retention include a decrease in corneal sensitivity and an increase in both corneal thickness and curvature. These changes occur later in pregnancy and may produce temporary alterations in refraction, making pregnancy a contraindication to refractive eye surgery.

Moreover, contact lens intolerance has been reported, so it is advisable to delay fitting and prescribing new corrective or contact lenses until several weeks postpartum.

Pregnancy may induce dry-eye syndrome due to a disruption of lacrimal acinar cells. In addition, newly developed Krukenberg spindles, not accompanied by other findings of pigment dispersion, have been observed

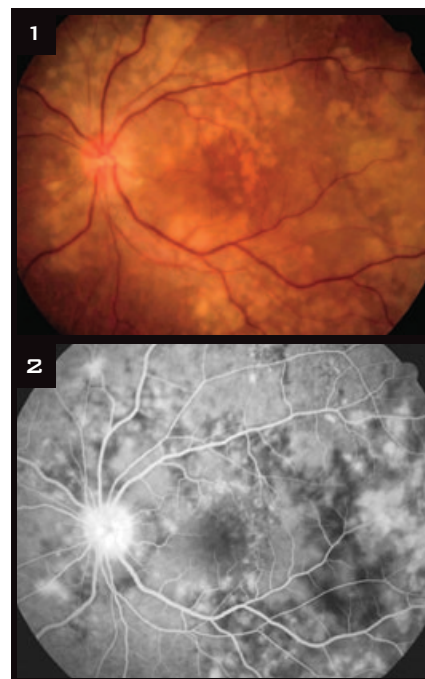
early in pregnancy; these usually decrease during the third trimester and postpartum.

IOP variations. Pregnancy, particularly the second half, is associated with decreased IOP in healthy eyes. In patients with ocular hypertension, this decrease may be even greater.¹ Possible mechanisms for these changes include increased aqueous outflow, decreased episcleral venous pressure, decreased scleral rigidity, and generalized acidosis during pregnancy.² IOP changes typically return to prepregnancy levels by two months postpartum.

Adnexal changes. The ocular adnexa may be affected by chloasma, a hormonally mediated increase in pigmentation around the eyes and cheeks, which is common during pregnancy. In addition, benign spider angiomas commonly develop on the face and upper body. Both of these adnexal changes often resolve postpartum.

Ptosis, often unilateral, can occur during or after pregnancy, most likely as a result of defects that develop in the levator aponeurosis from fluid, hormonal, and stress-related changes of labor and delivery.

Pregnancy-Specific Eye Disease
Preeclampsia and eclampsia. Although visible retinal vascular changes occur in 40 to 100 percent of preeclamptic patients, visual symptoms are reported in 25 to 50 percent. These symptoms, which tend to worsen with increasing disease severity, include blurred or decreased vision, photopsia,



LINKED TO PREGNANCY. (1) This preeclamptic patient with HELLP syndrome had a serous detachment of the retina and multiple yellowish placoid areas at the level of the RPE and inner choroid. (2) The early fluorescein angiographic frames showed reticular patterns of decreased choroidal perfusion bordering areas of hyperfluorescence. Early leakage from the level of the RPE is evident and becomes more apparent in the later phases of the fluorescein angiogram.

scotomata, diplopia, visual field defects, and blindness.^{3,4} The most common ocular finding is constriction or spasm of retinal arterioles, with a decreased retinal artery-to-vein ratio cor-

relating with severity. If the constriction is severe, changes associated with hypertensive retinopathy may occur, including diffuse retinal edema, hemorrhages, exudates, and cotton-wool spots. Possible mechanisms for these changes include hormonal changes, endothelial damage, hypoperfusion ischemia/edema, and coexisting systemic vascular disease.⁵

Other ocular abnormalities seen in preeclampsia and eclampsia include white-centered retinal hemorrhages, papillophlebitis, Elschnig spots, macular edema, retinal pigment epithelial (RPE) lesions, retinal artery and vein occlusion, optic neuritis, optic atrophy, and ischemic optic neuropathy.²

Exudative (or serous) retinal detachment occurs in less than 1 percent of patients with preeclampsia and in 10 percent with eclampsia, although preeclamptic and eclamptic women with HELLP syndrome (*hemolysis/elevated liver enzymes/low platelet count*) may be approximately seven times more likely to develop a retinal detachment than those who do not have the syndrome⁴ (Figs. 1, 2).

Exudative retinal detachment tends to be bilateral, diagnosed postpartum, more frequent in primiparous women, and more common in women who undergo cesarean delivery; it tends to resolve completely postpartum.⁴ Fluorescein angiographic findings support the hypothesis that retinal detachment in preeclampsia/eclampsia is secondary to choroidal ischemia from intense arteriolar vasospasm. The RPE usually resorbs the subretinal fluid postpartum, and visual acuity typically returns to predetachment levels within weeks.

Cortical blindness, which affects up to 15 percent of preeclamptic and eclamptic women, is often preceded or accompanied by headache, hyperreflexia, and paresis. This visual loss, if the exam is otherwise normal, often is recovered over a period varying from four hours to eight days, although bilateral inferior scotomata and visual field defects have been reported to persist for several months postpartum.³ An MRI scan may show focal occipital

lobe edema, including bilateral edema of the lateral geniculate nuclei, represented by hyperintense lesions on T₂-weighted images.⁶ The reversibility of these lesions, seen in the parieto-occipital area, has been documented on follow-up imaging.⁶

The constellation of findings (headaches, seizures, cortical blindness, and altered mental status) associated with preeclampsia/eclampsia and other diseases is referred to as reversible posterior leukoencephalopathy syndrome.

Because most of the visual disturbances tend to reverse during the postpartum period, the overall prognosis is good for preeclamptic patients. However, the onset of ophthalmic changes or fundus findings in a pregnant patient may presage the onset of seizures and should be evaluated by an obstetrician to rule out preeclampsia.

Central serous chorioretinopathy.

CSCR results in an accumulation of subretinal fluid that leads to a circumscribed neurosensory retinal detachment in the macula at the level of the RPE. Although CSCR is 10 times more common in men, in women it has a strong association with pregnancy, especially late in pregnancy. Patients most commonly present with unilateral metamorphopsia and moderately reduced visual acuity. Elevated levels of endogenous cortisol are thought to lead to increased permeability in the blood-retinal barrier, choriocapillaris, and RPE. White fibrous subretinal exudates are found in 90 percent of pregnancy-associated cases of CSCR, compared with 20 percent of general cases.⁷

Although CSCR usually resolves within a few months after delivery and visual acuity returns to normal, changes to the central visual field, metamorphopsia, and RPE alterations may persist. Diagnosis typically is made clinically, but optical coherence tomography has shown value in both identifying and following patients with CSCR.

Occlusive vascular disorders.

Purtscher-like retinopathy, most likely from arteriolar obstruction by complement-induced leukocyte aggregation,

has been documented in the immediate postpartum period. It is associated with preeclampsia, pancreatitis, amniotic fluid emboli, and hypercoagulability. Presentation often consists of severe bilateral visual loss shortly after delivery, with widespread cotton-wool spots with or without intraretinal hemorrhage.

The visual prognosis is guarded, but retinal changes and symptoms may resolve spontaneously. Branch and central retinal artery occlusions, as well as retinal vein occlusions (although these are less common), have been reported in pregnancy, presumably secondary to amniotic fluid emboli or a hypercoagulable state.

Preexisting Eye Disease

Diabetic retinopathy. Although studies have shown pregnancy to be an independent risk factor for worsening diabetic retinopathy (DR), the occurrence of gestational diabetes in the absence of preexisting diabetes does not seem to increase the risk for DR.

Other risk factors that may accelerate the worsening of DR in pregnant women include coexisting hypertension or preeclampsia, greater severity and duration of diabetes prior to pregnancy, poor prepregnancy glycemic control, rapid normalization of blood glucose levels during pregnancy, and changes in retinal blood flow. The standard treatment for DR is laser photocoagulation surgery. Although postpartum regression of DR may occur with uncertain rate and timing, women still are at an increased risk of progression for as long as one year postpartum.

Worsening macular edema (ME) may present as part of DR and is increased by coexisting hypertension, nephropathy, and proteinuria. This will often regress postpartum but may persist, resulting in long-term visual loss. Clinically significant ME typically is treated with focal laser photocoagulation.

The Academy recommends that women with diabetes who plan to become pregnant should have a prepregnancy dilated fundus exam. Dur-

ing pregnancy, an eye exam should be performed in the first trimester, with follow-up scheduled according to amount of retinopathy found. Those with no retinopathy to moderate non-proliferative DR should be reexamined every three to 12 months. Patients with findings of severe NPDR or worse should be reexamined every one to three months. Those diagnosed with gestational diabetes do not require retinopathy screening.⁸

Uveitis. For chronic noninfectious uveitis, pregnancy seems to confer a beneficial effect, with a lower incidence of flare-ups. This is possibly due to hormonal and immunomodulatory effects.

When flare-ups do occur, they take place most commonly during the first trimester; there also may be a rebound in activity within the first six months postpartum.

Toxoplasmosis. Latent ocular toxoplasmosis may reactivate during pregnancy, with a negligible risk to the fetus of acquiring congenital toxoplasmosis. Spiramycin has been recommended over pyrimethamine as a safer, yet equally effective, treatment in pregnant women.

- 1 Qureshi IA. *Arch Med Res.* 1997;28(3):397-400.
- 2 Omoti AE et al. *Afr J Reprod Health.* 2008; 12(3):185-196.
- 3 Schultz KL et al. *Curr Opin Ophthalmol.* 2005;16(5):308-314.
- 4 Vigil-De Gracia P, Ortega-Paz L. *Int J Gynaecol Obstet.* 2011;114(3):223-225.
- 5 Dinn RB et al. *Obstet Gynecol Surv.* 2003; 58(2):137-144.
- 6 Cunningham FG et al. *Am J Obstet Gynecol.* 1995;172(4 Pt 1):1291-1298.
- 7 Sunness JS et al. *Arch Ophthalmol.* 1993; 111(3):360-364.
- 8 *Preferred Practice Pattern Guidelines: Diabetic Retinopathy.* American Academy of Ophthalmology. 2008. Available at www.aaopt.org/ppp.

Mr. Cheung is a medical student and Dr. Scott is professor of ophthalmology and public health sciences; both are at Penn State College of Medicine in Hershey, Pa. The authors report no related financial interests.

Focal Points Delivers

Practical, clinical
knowledge year-round!



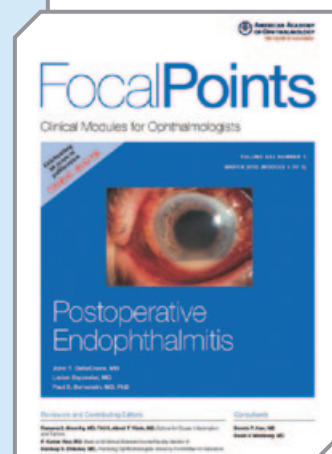
A 2012 Focal Points subscription delivers:

- > Twelve clinical modules straight to your mailbox or online.
- > Quality, trusted clinical information written and reviewed by leading experts.
- > Up to 2 AMA PRA Category 1 Credits™ per module.

2012 Focal Points Module Titles

(Subject to change)

- Postoperative Endophthalmitis
- Update on the Surgical Treatment of Keratoconus
- Pediatric Glaucoma
- Update on Glaucoma Surgery
- Update on Orbital Tumors
- Pseudophakic Cystoid Macular Edema
- Ophthalmic Viscoelastic Devices
- Biologic Response Modifiers in Uveitis
- Pediatric Diagnoses You Don't Want to Miss
- Management of Orbital Trauma
- Corneal Biomechanics: Basic Science and Clinical Applications
- Anisocoria



Subscribe today!

Visit www.aaopt.org/focalpoints for pricing and details. Or, call Customer Service at **415.561.8540**. Print modules are mailed quarterly in March, June, September and December. Online modules are released monthly and can be accessed by visiting www.aaopt.org/myonlineproducts and logging in with your Academy username and password.

The American Academy of Ophthalmology is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The American Academy of Ophthalmology designates this enduring material for a maximum of 2 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

 **AMERICAN ACADEMY
OF OPHTHALMOLOGY**
The Eye M.D. Association