

# Eye Care, Understanding and Special Consideration during Pregnancy

Amarildo Belshi<sup>1</sup> Rustem Celami<sup>2</sup>

1.Ophthalmology Service, Mother Teresa University Hospital Centre, F. of Medicine, University of Medicine  
Tirana

2.University Hospital of Obstetrics and Gynecology Koço Gliozheni, F. of Medicine, University of Medicine  
Tirana  
Tirana, Albania

## Abstract

Pregnancy is often associated with ocular changes which may be more commonly transient but occasionally, permanent. It may be associated with the development of new ocular conditions, or can exacerbate pre existing conditions. The ocular effects of pregnancy may be physiological or pathological or may be modifications of pre existing conditions. Adnexial changes include chloasma, spider angiomas and ptosis. Anterior segment changes include a decrease in conjunctival capillaries and an increase in the granularity of conjunctival venules and in corneal curvature, changes in corneal thickness, refractive index, accommodation and refractive errors, and a decrease in intraocular pressure. Posterior segment changes include worsening of diabetic retinopathy, central serous chorioretinopathy, increased risk of peripheral vitreochorioretinal dystrophies and retinal detachment, and a beneficial effect on non-infectious uveitis. Systemic disorders of importance include preeclampsia, Graves' disease and multiple sclerosis. Intracranial disorders with ocular effects in pregnancy include pseudo-tumor cerebri, prolactinoma and Sheehan's syndrome. Conclusion, since during pregnancy arise all these physiological, pathological, exacerbation and modification of pre existing condition special care and understanding of these changes should be taken into special consideration as it involves dual care of the mother and the fetus.

**Keywords:** Ocular changes, pregnancy, care, understanding

## Introduction

Various physiologic changes happen within women body during pregnancy and the eye is not excluded by these changes. The article's aim is to outline normal physiologic, pathological changes, exacerbation and modification of pre existing condition in the eye that can occur during pregnancy and medical care and special consideration that should be undertaken.

## Discussion

### *Common Physiological Ophthalmic Changes During Pregnancy*

Corneal sensitivity has been found to be decreased in most pregnant women, where a mainstream of changes occur in third trimester of pregnancy and then reverse in postpartum period. One probable mechanism might be correlated to slight increase in corneal thickness that may develop from corneal edema. Also, an increase in corneal curvature and steepening may perhaps occur as well. These changes have been reported to expand even in postpartum period during breastfeeding. However, corneal curvature is reversible upon cessation of breastfeeding. Contact lens intolerance may take place during pregnancy as a result changes in corneal curvature, increased corneal thickness/edema or distorted tear film. Nevertheless, it is recommended that should wait several weeks postpartum before prescribing to a new refraction.

Decreased intraocular pressure is known to occur during pregnancy and often persists for several months postpartum. Diverse mechanisms have been described for this observation: increase in aqueous outflow, decrease in systemic vascular resistance, leading to decreased episcleral venous pressure; generalized increased tissue elasticity, leading to decreased scleral rigidity; and generalized acidemia during pregnancy. Decreased intraocular pressure might have implications for pregnant women with pre existing glaucoma, since improvement of the disease during pregnancy has been reported in a few cases. Extensive theories exist about the degree and mechanism of visual field changes that occur in pregnant women. Types of field loss include bitemporal loss, concentric constriction, and enlarged blind spots. Proposed mechanisms are similarly diverse and include changes to pituitary gland that may affect optic chiasm. These asymptomatic visual field changes were shown to be completely reversible postpartum, however, pregnant women with symptomatic visual field loss warrant further investigations.

An additional common external result of pregnancy is changes to skin called chloasma. Due to increased hormone levels of progesterone, some pregnant women experience increased pigmentation around the eyes and cheeks. The pigmentation changes tend to fade slowly postpartum.

### *Common Pathological Ophthalmic Changes During Pregnancy*

The onset of hypertension more than 140/90 mmHg after 20 week of gestation in an otherwise normotensive pregnant woman with proteinuria more than 300 mg/24 hour is the minimal criteria needed to diagnose a patient with preeclampsia [1]. Moreover, if these changes are associated with seizures, which are not attributed to any other cause, then the disorder is classified as eclampsia. The most common ocular complaint is visual blurriness; however, other symptoms have also been noted, including photopsias, scotomas, and diplopia. The protean ocular manifestations include retinopathy, optic neuropathy, serous detachments, and occipital cortical changes. Changes in retinopathy due to preeclampsia are similar to hypertensive retinopathy. The most common finding is focal retinal arteriole narrowing, which also may be diffuse. Other changes include; retinal hemorrhages, edema, exudates, nerve fiber layer infarcts, and vitreous hemorrhage secondary to neovascularization. A positive correlation exists between the severity of preeclampsia and the degree of retinopathy; however, most changes are reversible once preeclampsia resolves. Preeclampsia retinopathy may be more severe with underlying diabetes, chronic hypertension, and renal disease. Cortical blindness, although a rare complication, has been a reported cause of vision loss in patients with preeclampsia. Cerebral edema is believed to be the mechanism of vision loss. Two proposed theories may account for the cerebral edema; one theory suggests that vasospasm causes transient ischemia and produces cytotoxic edema; the other theory explains that preeclampsia causes increased permeability from circulatory dysregulation, thus providing vasogenic edema [2]. Treatment or resolution of preeclampsia and the resultant cerebral edema usually parallels visual recovery. Preeclampsia may cause certain non vision threatening changes in the eye, including conjunctival vascular spasm or tortuosity, papillary mydriasis, ptosis, and nystagmus.

Optic nerve changes have been reported; papilledema, acute ischemic optic neuropathy, and optic atrophy. Serous exudative retinal detachments may occur in severe preeclampsia or eclampsia. Most patients with serous detachments have resolution of symptoms a few weeks within postpartum.

Benign intracranial hypertension also known as pseudo-tumor cerebri, is defined as increased intracranial hypertension and its possible sequelae, with normal cerebrospinal fluid composition and normal neuro-imaging. It typically occurs in obese females in their third decade of life. Interestingly, pregnancy does not increase the risk of developing BIH and if occurs, it usually presents in the first trimester but may occur later and does not carry any fetal consequences and carries the same visual outcome in non pregnant patients. Treatment for BIH in pregnancy is similar to that in non pregnant patients with a few considerations; intense weight loss is not recommended because of risk to fetal viability; carbonic anhydrase inhibitors are contraindicated during pregnancy due to the potential fetal teratogenic effects; use of diuretics poses the risk of electrolyte and placental blood flow changes. Reports exist of spontaneous improvement with no treatment and very close follow-up care of optic nerve function. However, with visual compromise, interventions, such as bed rest, lumbar puncture, optic nerve sheath decompression, and lumboperitoneal shunting, have been reported.

It is well appreciated that pregnancy represents a hypercoagulable state, through various changes that occur with platelets, clotting factors, and arteriovenous flow dynamics. Such changes may be related to the development of retinal artery and vein occlusions, disseminated intravascular coagulopathy, thrombotic thrombocytopenic purpura, amniotic fluid embolism, and cerebral venous thrombosis.

Both branch and central retinal artery occlusions have been reported to occur in pregnancy. Although a hypercoagulable workup may detect an abnormality, routine hematological workup may be unremarkable. A case report exists of bilateral central retinal artery occlusion from amniotic fluid embolism, which in and of itself is a potentially fatal condition. Retinal vein occlusions are less common than arterial occlusions. Antiphospholipid antibody syndrome is another condition that warrants consideration. In this syndrome, patients are in a thrombophilic state and are prone to recurrent arterial and/or venous thrombosis. Diagnostic criteria include clinical evidence of recurrent pregnancy loss or thrombosis in any organ or tissue as well as laboratory evidence of circulating antiphospholipid antibodies or lupus anticoagulant. Ophthalmic manifestations may present in form of vascular thrombosis of retina, choroid, optic nerve and visual pathway, and ocular motor nerves.

Ptosis has been reported to occur during and after normal pregnancy and usually is unilateral. The mechanism is thought to be due to defects that develop in levator aponeurosis from fluid, hormonal, and other changes due to stress of labor and delivery.

### *Pre existing Ocular Disorders During Pregnancy*

Pregnancy can have adverse outcome on preexisting diabetic retinopathy. The worsening of disease depends on multitude of factors as follows: severity of retinopathy at conception, duration of diabetes, glycemic control, and presence of coexisting hypertension. Well managed gestational diabetes poses very low risk for the development of retinopathy [2, 3, 10].

Studies on patients who have had no initial diabetic retinopathy show that approximately 10% of pregnant women with diabetes progress to some background retinopathy changes [2, 3]. However, less than 0.2%

of pregnant women with diabetes progressed to the proliferative disease [2, 3]. A single baseline ophthalmologic examination may be adequate in the first trimester unless visual symptoms occur.

Additionally, studies in patients who had nonproliferative diabetic retinopathy demonstrated that as many as 50% of them may show an increase in their nonproliferative retinopathy, which often improves by the third trimester and postpartum [2]. Approximately 5-20% of patients develop proliferative changes, where the risk being higher in those patients who had severe nonproliferative retinopathy at the beginning of their pregnancy [3]. An ophthalmologic examination at least once every trimester is recommended for patients with nonproliferative diabetic retinopathy.

Macular edema may develop or worsen during pregnancy. It has been shown that macular edema is often linked to pregnant women who have diabetes along with proteinuria and hypertension and unfortunately there is lack of studies examining the initiation of treatment during pregnancy. It may not be unreasonable to observe such patients until they reach postpartum. Intrapartum glycemic control has been demonstrated to be a better indicator of potential fetal wellbeing than the grade of diabetic retinopathy at onset of pregnancy. Hence, obstetrical and endocrinological follow up care is critical to future wellbeing of the mother and fetus. With pregnancy, previously asymptomatic pituitary adenomas or microadenomas may enlarge and result in various ophthalmic symptoms, such as headache, visual field change, and/or visual acuity loss. For this reason, patients with amenorrhea are often screened to rule out pathological causes such as pituitary mass prior to initiating pro ovulation medications. Although most pituitary adenomas remain asymptomatic during their pregnancy, a small proportion may require radiation or surgical intervention if vision becomes threatened. Both radiation and surgical therapy is effective and has no perinatal implications. In patients with a prolactinoma, an alternative treatment is bromocriptine, which has been shown not to have any increased risk to the fetus. Corticosteroid therapy has been reported as a treatment option. After pregnancy, pituitary adenomas regress in size and usually have no visual sequelae. It is recommended that pregnant patients with pituitary adenomas and microadenomas have monthly ophthalmic follow-up care with visual field assessment to rule out enlargement. Symptomatic pituitary adenomas may require the combined efforts of an ophthalmologist, obstetrician, neurosurgeon, and endocrinologist to decide upon the appropriate medical, surgical, or radiation treatment. One potentially visual threatening complication of pituitary adenomas is the sudden increase in pituitary size from infarction or hemorrhage referred to as pituitary apoplexy. This condition may present as a sudden onset of headache, visual loss, and/or ophthalmoplegia. Pregnancy is one of several potential risk factors for its occurrence. The management of such patients includes a neurosurgical opinion for potential surgical decompression. Endocrinological coverage also is warranted because of the risk of hypopituitarism (Sheehan syndrome).

Meningiomas are benign, slow growing tumors that typically occur in older females. However, they may present in pregnancy due to their usually rapid increase in size. Often ophthalmic symptoms of decreased vision or visual field loss are the first manifestations. Since most of these tumors regress in size postpartum, those patients who are asymptomatic or with mild symptoms can be observed and left untreated. For those patients who require treatment, it is usually surgical since these tumors are not radiation or chemotherapy sensitive. Indications for timing and type of intervention require individual case analysis. Uveal melanoma is a rare occurrence among pregnant patients, as they usually occur in the older population. From the limited case reports that exist, it appears that uveal melanomas behave no differently in pregnancy, and those that have been treated show similar 5-year survival rates to the nonpregnant treated population [4, 5]. No increased risk of metastases is apparent with pregnancy, and no case reports of placental or fetal metastases exist [4, 5]. Case reports exist of other intracranial tumors occurring during pregnancy, such as lymphocytic hypophysitis, which may mimic a pituitary adenoma [6]. Other uncommon intracranial masses include choroidal hemangiomas, craniopharyngiomas, and orbital hemangiomas.

An exacerbation of Graves disease may occur during the first trimester of pregnancy or even postpartum [7, 9]. The disease usually is quiescent during the latter portion of the pregnancy. Patients with Graves orbitopathy are treated in a similar fashion to patients who are not pregnant [7, 8, 9]. The Obstetrician and ophthalmologist should be aware of the symptoms of thyrotoxicosis such as tachycardia, weight loss, labile emotions, tremor, diaphoretic because it represents an endocrinological emergency to both the mother and the fetus. Case reports of progression of retinitis pigmentosa during pregnancy exist, however, these reports do not suggest a clear mechanism. Much like, inflammatory conditions, multiple sclerosis has been known to stabilize or even improve during pregnancy, yet, an increased risk of relapse postpartum exists.

There have been concerns of retinal tears and detachments in patients with high myopia undergoing spontaneous vaginal delivery [11, 12, 13]. However, studies of women with -4.5 D to -15 D and various pre existing retinal pathology like lattice degeneration, treated retinal tears or detachments has demonstrated no deleterious effects on the retina with spontaneous vaginal delivery [11].

## Conclusion

During pregnancy arise numerous physiological, pathological, exacerbation and modification of pre existing

condition special care and understanding of these changes should be taken into special consideration as it involves dual care of the mother and the fetus. Prescription of medications such as antibiotics, corticosteroids, topical and hypertensive medication are often required to be used, so a thorough knowledge of the effect of ophthalmic medications in pregnancy and lactation must be appreciated before they are prescribed to the patients. These considerations in Albania should involve necessarily patient education about the consequences of taking unprescribed medication as population access to medicines is not well controlled.

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