

# Ocular Changes in Pregnancy: An Observational Study

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## Abstract

**Introduction:** Ocular changes which occur during pregnancy are broad and common. They can be divided into physiological or pathological, and some changes may be associated with pre-existing conditions. Physiological changes are lid telangiectasia, ptosis, increased pigmentation around the eyes and cheeks, corneal edema, decreased corneal sensation, increased corneal thickness, and curvature. Contact lens intolerance, dry eye syndrome, and decreased intraocular pressure are also some of the physiological changes seen during pregnancy. Although ocular complications are common in pregnancy, most of them are mild which requires no treatment. However, it is important to identify serious conditions that occur during pregnancy requiring immediate medical attention.

**Purpose:** The aim of the present study is to report significant ocular changes that occur during pregnancy.

**Materials and Methods:** A prospective cross-sectional clinical study was done in 120 women with pregnancy (gestational period from 24 weeks to 38 weeks). A detailed medical, ocular, and gestational history was obtained. All pregnant women underwent detailed eye examination including assessment of visual acuity, refraction, ocular motility, keratometric reading, anterior segment examination with slit lamp biomicroscope, intraocular pressure recording with noncontact tonometer, corneal sensitivity, and dilated fundus examination.

**Results:** A total of 120 women with pregnancy (gestational period 24–38 weeks) underwent detailed eye examinations. 38% showed clinically significant retinal changes with high blood pressure, and in these cases, only 31% showed physiological changes along. Other significant pathological conditions were also noticed. Most ocular disease can be treated with drugs.

**Conclusions:** All pregnant women during antenatal and postpartum period should undergo complete ophthalmic examination and treatment. Early detection of retinal abnormalities can prevent serious complications.

**Key words:** Corneal curvature, Hypothyroidism, Ocular changes, Pregnancy, Refractive error, Retinal abnormalities

## INTRODUCTION

Ocular changes that occur in pregnancy are usually temporary in nature, but occasionally, there may be permanent disorders. These ocular changes can be either physiological or pathological or both. If we talk about pathological changes in a pregnant woman, it can be new developed ocular changes due to the pregnancy or a pre-existing ocular changes (which worsen due to the pregnancy) or a systemic disease

(which can be pre-existing or developed due to pregnancy); physiological changes in pregnancy are low IOP, chloasma, hyposphagma, tear film composition alterations, decreased sensations, krukenberg's spindles increased thickness alteration in refractive power, increased thickness of lens leading to refractive changes, and pituitary gland enlargement.<sup>[1]</sup> Pathological changes are the growth of hemangiomas, carotid-cavernous fistula, ptosis, Horner's syndrome, facial nerve palsy, vasospasm in preeclampsia, worsening of diabetic retinopathy, vascular changes in preeclampsia, serous retinal detachment, central serous chorioretinopathy, growth of melanomas, ischemic optic neuropathy, papilledema, and cortical blindness in eclampsia.<sup>[2]</sup> Physiological changes usually resolve in postpartum period. Pre-existing diseases such as Graves' disease, retinitis pigmentosa, optic neuritis, diabetic retinopathy, hypertensive retinopathy, glaucoma, intracerebral tumors, uveitis, multiple sclerosis, and other

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inflammatory conditions or pregnancy-induced conditions such as gestational diabetes, pre-eclampsia, and eclampsia should be monitored during and post pregnancy. There are certain rare conditions which are also noted during the phase, i.e., neuro-ophthalmological condition such as pseudotumor cerebri (benign intracranial hypertension), prolactinoma (adenoma of pituitary gland), and venous sinus thrombosis. They present as headache, visual field defect, and optic disc edema. Systemic diseases with ocular complications are Sheehan syndrome, Grave's disease, idiopathic intracranial hypertension, antiphospholipid antibody syndrome, and disseminated intravascular coagulation. Although ocular complications are common in pregnancy, most of them are mild which requires no treatment. However, it is important to identify serious conditions that occur during pregnancy requiring immediate medical attention.

### Aims

The aim of the study is to report significant ocular changes during pregnancy.

## MATERIALS AND METHODS

It was a cross-sectional observational study carried out jointly in the Department of Ophthalmology and Department of Obstetrics and Gynaecology of Rajarajeswari Medical College and Hospital, Bengaluru (Karnataka), from October 2016 to March 2017 (6 months). Study subjects include 120 pregnant women (gestational period from 24 weeks to 38 weeks). An oral informed consent was obtained from all women participating in the study.

### Exclusion Criteria

Pregnant women with any preexisting comorbidity such as diabetes and hypertension and pregnant women with any pre-existing ocular morbidity such as cataract, uveitis, glaucoma, retinal, and optic nerve disorders were excluded from the study.

### Evaluation of the Patient Included the Following in Each Case

Complete ophthalmic history and medical history were taken. The measurement of the uncorrected visual acuity and best-corrected visual acuity was done. Intraocular pressures were recorded using noncontact tonometer. Anterior segment of both the eyes was examined under the slit lamp biomicroscope. Corneal sensitivity was noted with the help of cotton wisk. Dry eye evaluation were done with the help of schmeirs test and manually binocular eye movement were observed. Fundus evaluation of both the eyes was done through dilated pupils using direct ophthalmoscope, and keratometry was done using Bausch

and Lomb Keratometer. The data were expressed in the form of percentages.

## RESULTS

These 120 women based on their analysis showed a varied result. 38% showed clinically significant retinal changes with high blood pressure leading to the categoric division of the pathological condition along with its physiological [Figure 1]. Physiological changes were seen in 79% of the patients [Figure 2]. 10 among these 120 showed papilledema [Figure 3].

## DISCUSSION

In pregnant women, various physiological changes take place due to hormonal effect in the placenta that is increased estrogen, increased progesterone, and increased melanocyte stimulating hormone. In pathological ocular condition, discussing about the ptosis which is seen is because of fluid and hormonal effect on the levator aponeurosis. Increased immune reaction in lacrimal duct cell and dehydration due to nausea and vomiting is the cause of tear film alteration. Corneal changes that can increase thickness and reduce sensation are due to corneal

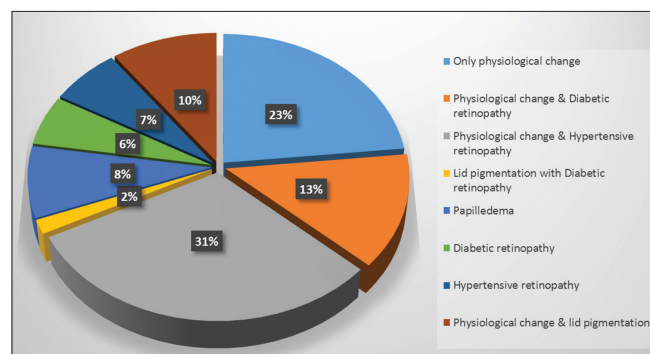


Figure 1: Percentage of ocular changes in pregnancy

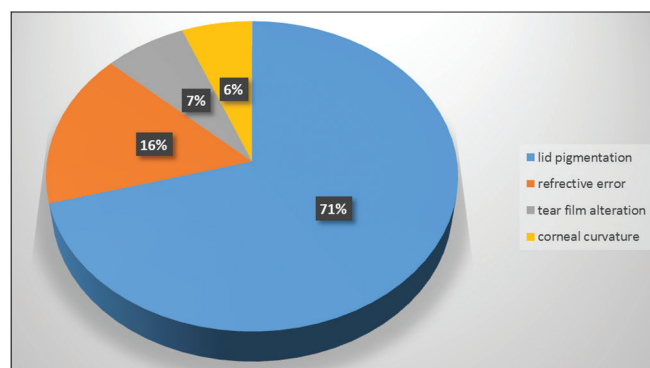
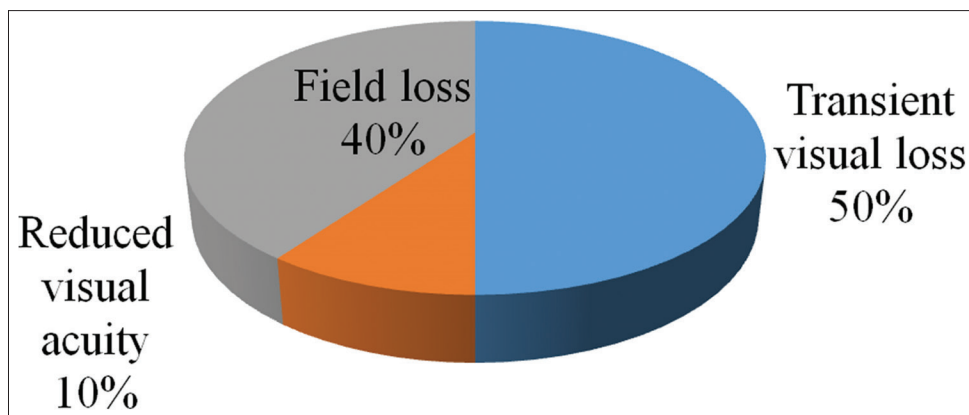


Figure 2: Percentage of physiological ocular changes in pregnancy



**Figure 3: Patients with papilledema**

edema.<sup>[3]</sup> This leads to refractive error and contact lens intolerance. Hence, it is important to avoid new spectacles prescription and avoid any refractive surgery. Intraocular pressure was found to be less among pregnant women. Retinal changes which are significant are either diabetic retinopathy or hypertensive retinopathy. Case of diabetic retinopathy is of low-risk which disappears on blood sugar control, while on the other side, pre-eclampsia the most common finding being retinal arterial narrowing, followed by retinal hemorrhages and exudates which also give rise to exudative RD.<sup>[4]</sup> 80 patients complained of headache, among which ten patients had papilledema. Most common symptom of papilledema is transient visual obscuration which is described as the dimming of vision of one or both the eyes for up to 30 s. These visual changes often occur due to orthostatic changes in the patient. The patient may also complain of loss of peripheral vision in one or both the eyes starting in the nasal inferior quadrant which progresses to the central visual field. The field loss tends to mimic glaucoma field loss. Visual acuity may also be affected.<sup>[5]</sup> Increase in headaches is caused by a surge of hormones in pregnancy along with an increased volume of blood circulating throughout the body.<sup>[6]</sup>

## CONCLUSION

Hypertensive retinopathy is a common ocular manifestation in pregnant women. Ocular changes in pregnancy can help to differentiate the physiological changes from ocular manifestations of systemic disease pertaining to the eye in a pregnant woman. All pregnant women during antenatal period should undergo complete ophthalmic examination. Early detection of retinal changes in pregnancy can prevent serious complications.

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