

The Ocular Changes during Pregnancy

Suchita Lohani¹; Raj Kumar^{2*}

¹M. Optom. Scholar, ^{2*}Professor,

Department of Optometry, School of Allied & Health Sciences,
Galgotias University, Greater Noida, Plot No 17A, GB. Nagar, India.

Abstract:- Many physiological changes occur during pregnancy, including ones that impact the eyes. These changes are primarily brought on by adjustments to blood flow, metabolism, and hormone balance. While the majority of visual alterations that occur during pregnancy are transient and benign, some preexisting problems may worsen or new pathologies may appear, necessitating an early diagnosis and course of therapy. To keep an eye on these changes, routine prenatal eye examinations are essential. Increased corneal thickness from water retention and hyperglycemia, changed refractive indices from fluid retention and alterations in lens curvature, and dry eyes from altered tear film physiology are common ocular abnormalities. Hormonal impacts also usually result in a decrease in intraocular pressure. Retinal detachment and hemorrhages can be caused by serious illnesses such as hypertensive disorders of pregnancy, and diabetic retinopathy may worsen due to gestational diabetes. Idiopathic intracranial hypertension and central serous chorioretinopathy can also occur; these conditions typically go away after giving birth or with weight control. Thyroid level monitoring is crucial for the treatment of Graves' ophthalmopathy. To protect the health of both the mother and the fetus, early detection and treatment of these ocular abnormalities are essential components of effective prenatal screening programs.

Keywords:- Pregnancy; Ocular Changes; Central Corneal Thickness (CCT); Gestational Diabetes Mellitus (GDM); Diabetic Retinopathy (DR); Pregnancy Induced Hypertension (PIH);

I. INTRODUCTION

Changes in blood flow, hormone balance, and metabolism are unique conditions associated with pregnancy. Many visual abnormalities can occur during pregnancy, most of which are transient and rarely cause problems. Many times, women who are expecting are concerned about utilizing eye drugs or how pregnancy may impact any pre-existing eye disorders. [1] Pregnancy is known to frequently cause changes in the eyes. While most of them are harmless physiological responses to the immunologic, hormonal, and metabolic adjustments needed to accept the fetus, some significant diseases can sometimes appear during pregnancy, worsen, or even disappear; in these cases, timely diagnosis and treatment

are necessary. Problematic eye problems fall into two categories: pathologies that already exist and emerging ocular ailments. The most crucial thing is to put in place a successful prenatal screening program to monitor any new developments or additional advancements of these ocular abnormalities, regardless of the numerous processes that underlie these modifications in the eyes. Regardless of the pregnant woman's present level of visual health, routine prenatal eye exams should be scheduled to guarantee continuing monitoring of healthy eyes. [2] The internal and exterior surfaces of the eyes are both impacted by physiological changes associated with pregnancy. Numerous harmful alterations, such as the emergence of underlying diseases and conditions including central serous retinopathy and occlusive vascular disorders, are linked to gestational hypertension and diabetes. [3] A physiological condition known as gestational diabetes mellitus (GDM) develops during pregnancy and is typified by the advent of hyperglycemia in women who had not previously had diabetes. Usually, this condition goes away after childbirth.[4] As the body becomes less receptive to insulin during pregnancy, pancreas cells produce more of the hormone.[5] Women who have gestational diabetes have an increased chance of complications during pregnancy and may go on to acquire type 2 diabetes following childbirth.[6] Pregnancy affects a number of ocular structures, including the orbit, cornea, lens, retina, optic nerve, eyelid, and conjunctiva. Retinal abnormalities can worsen during pregnancy in women with diabetes and hypertension, and they may be associated with the severity of eclampsia or gestational diabetes mellitus (GDM). Additionally, the hormonal changes associated with pregnancy may cause the corneas to become thicker and more curved, which may worsen or induce keratoconus.[7] The risk of developing and exacerbating diabetic retinopathy (DR) is increased during pregnancy. Long-term DR is unaffected by pregnancy, while 50%–70% of individuals see changes in the course of their retinopathy. Up to a year following delivery, there is a higher chance of deteriorating during the second trimester. [8]

Gestational hypertension, formerly known as pregnancy-induced hypertension (PIH), is the term used to describe hypertension that first manifests after 20 weeks of gestation.[9] Four types should be distinguished, according to the National High Blood Pressure Education Program's Working Group on High Blood Pressure in Pregnancy: Preeclampsia with chronic hypertension, preeclampsia

alongside chronic hypertension.[10] Changes in appearance are often associated with pregnancy. Serious retinal detachments and blindness, which usually disappear after giving birth, are more likely to occur in preeclampsia. Diabetic women should see an ophthalmologist before or early in the first trimester of their pregnancy due to the higher risk of preexisting proliferative diabetic retinopathy worsening during pregnancy. [11]

The aim of this study is to through a light on the various ocular changes during pregnancy and summarizing them in a single article. The goal is to highlight the importance of prenatal screening and routine eye examination to promptly diagnose, monitor, and manage any ocular abnormality, thereby ensuring the optimal visual health of pregnant women.

II. CORNEAL CHANGES

The central corneal thicknesses (CCT) of pregnant women increase during the second and third trimesters of their pregnancy, most likely due to water retention; these values often return to normal following delivery. Additionally, in pregnant women with gestational diabetes, hyperglycemia raises central corneal thickness (CCT). Pregnancy-related increases in estrogen cause stromal hydration, which raises central corneal thickness (CCT), particularly in the third trimester. [12] Additionally intracellular sorbitol accumulation brought on by excess glucose in the cornea, acts as an osmotic agent and causes corneal cells to enlarge.[13] Corneal sensitivity may decrease throughout pregnancy; this decrease becomes more pronounced as the pregnancy draws to a close. Because contact lens sensitivity during pregnancy has been recorded, it is best to wait a few weeks following delivery before prescribing contact lenses. [14]

III. REFRACTIVE ERROR CHANGES

The common refractive condition that occurs during pregnancy is simple myopia. The refractive index may vary during pregnancy due to hormonal changes that cause the cornea to retain fluid. [15] The third trimester of pregnancy is when the majority of postpartum refractive changes occur.[16]

IV. TEAR FILM CHANGES

Pregnancy's effects on tear film physiology lead to dry eyes. This may be due to prolactin-induced acinar cell death through transforming growth factor beta-1 and epidermal growth factor, as well as an increased immune response in the lacrimal duct cells. [17]

V. MEIBOMIAN GLAND CHANGES

Women who are expecting see a larger decrease in their meibomian glands. During pregnancy, the meibomian gland's capacity to release lipids is influenced by the hormones testosterone and estrogen. It is common for androgenic factors to augment and estrogenic factors to diminish the meibomian gland's ability to produce lipids. [18]

VI. INTRAOCULAR PRESSURE

During pregnancy, intraocular pressure often drops by 2-3 mmHg. This is thought to be connected to fluctuations in progesterone levels, which cause the episcleral vein's pressure to drop. Consequently, the eye experiences reduced resistance to the outflow of aqueous humor, leading to a slight reduction in intraocular pressure. [19]

VII. GLAUCOMA

It can be challenging to treat glaucoma in expectant mothers; however, skipping anti-glaucoma medication during pregnancy may help lower IOP. Ophthalmologists may decide to postpone prescribing anti-glaucoma medications to expectant mothers due to the decrease in intraocular pressure that comes with growing older, the possibility of birth defects, and patient concern. [20]

VIII. PATHOLOGICAL CHANGES: DESCRIBED BELOW IN [TABLE-1] [20 – 24]**Table -1 Pathological change during pregnancy**

Ocular pathology	Description	Mechanism	Management
Hypertensive disorder of pregnancy	Includes pre-eclampsia and eclampsia Can cause retinal detachment, hemorrhages	Vascular changes due to hypertension	Control blood pressure regular monitoring
Diabetic retinopathy (DR)	Exacerbation of pre existing retinopathy Gestational diabetes can increase the progression	Increased metabolic demands	Strict glycemic control, retinal screenings
Center serous chorioretinopathy (CSCR)	Accumulation of fluid under the retina causing visual disturbance	Increased cortisol levels	Observation, postpartum resolution
Idiopathic intracranial hypertension	Increased intracranial pressure causing headaches, vision changes	Possibly related with weight gain and hormonal changes	Weight management
Graves Ophthalmopathy	Worsening of thyroid eye disease	Fluctuations in thyroid hormone levels	Monitoring thyroid levels

IX. CONCLUSION

Significant physiological changes are brought on by pregnancy, and these changes can impact eye health. While the majority of visual alterations that occur during pregnancy are transient and benign, new pathologies or the worsening of pre-existing disorders might happen. To track these changes and guarantee an early diagnosis and course of therapy, routine prenatal eye exams are essential.

- Pregnancy-related corneal abnormalities might result from changes in hormone levels, fluid retention, and metabolism.
- Changes in corneal thickness, modified refractive indices, dry eyes, and reduced intraocular pressure are often seen alterations.
- Pregnancy can cause the development or exacerbation of serious illnesses such as idiopathic intracranial hypertension, central serous chorioretinopathy, gestational diabetes, and pregnancy-related hypertensive disorders.

It is imperative to identify and treat these visual abnormalities as soon as possible to protect the health of the mother and fetus. Pregnant women should protect their eyesight and general health by being aware of the possible ocular dangers connected to pregnancy and making routine eye care a priority.

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