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A OBSERVATIONAL STUDY OF OCULAR CHANGES IN PREGNANCY IN NORTH INDIA

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Abstract

Background: Pregnancy results in various changes to all systems within the body, including the visual system. During pregnancy, several physiological changes can occur within the eye, such as changes to the corneal morphology, dry-eye disease, and a reduction in intraocular pressure. Pathological ocular conditions may also occur during pregnancy due to a pre-existing disease or a new disease. **Aim and Objective:** The aim of the study is to examine ocular changes in pregnancy in north India. **Materials and Methods:** A prospective cross-sectional clinical study was done in 100 women with pregnancy (gestational period from 24 weeks to 38 weeks). A detailed medical, ocular, and gestational history was obtained. All pregnant women underwent a detailed eye examination, including assessments of visual acuity, refraction, ocular motility, keratometric reading, anterior segment examination with a slit lamp biomicroscope, intraocular pressure recording with a non-contact tonometer, corneal sensitivity, and dilated fundus examination. **Results:** A total of 100 women with pregnancy (gestational period 24–38 weeks) underwent detailed eye examinations. 40% showed clinically significant retinal changes with high blood pressure, and in these cases, only 30% showed physiological changes along the way. **Conclusions:** All pregnant women during the antenatal and postpartum periods should undergo a complete ophthalmic examination and treatment. Early detection of retinal abnormalities can prevent serious complications.

Key words: corneal curvature, 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, 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 pre-existing ocular changes (which worsen due to the pregnancy) or a systemic

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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, and Krukenberg's spindles. increased thickness alteration in refractive power, increased thickness of lens leading to refractive changes,and pituitary gland enlargement. [1] Pathological changes include the growth of hemangiomas, carotid-cavernous fistulas,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 [2]

Physiological changes usually resolve in the 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 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 that are also noted during the phase, i.e., neuro-ophthalmological conditions such as pseudotumor cerebri (benign intracranial hypertension), prolactinoma (adenoma of the pituitary gland), and venous sinus thrombosis. They present as headaches, visual field defects, and optic disc edema. Systemic diseases with ocular complications include 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 and require no treatment. However, it is important to identify serious conditions that occur during pregnancy that require immediate medical attention.

Physiological and harmless ocular changes

All structures in and around the eye can undergo changes during and after pregnancy. The frequency of each type of change is indicated in the table and in the text whenever such information is available. 90% of pregnant women have increased skin

pigmentation [3], and 5% to 70% (4, e2, e3) have chloasma (the "mask of pregnancy"), i.e., reversibly increased skin pigmentation in the face, on the dorsum of the nose, and on the eyelids. The probability of chloasma depends on

- sunlight exposure,
- genetic predisposition,
- and skin type.

A connection to thyroid disease is also suspected. Similar changes can be seen in women taking oral contraceptive drugs. 3% of pregnant women have reversible pigmentation of the posterior surface of the cornea (Krukenberg's spindle) [4] as a non-pathological finding.

Pathological ocular changes

A few cases of ptosis due to hormonally-induced weakening of the attachment of the levator palpebrae have been described in the literature [5]. This benign change must

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be distinguished from an oculomotor nerve palsy (in which ptosis is accompanied by extraocular muscle weakness leading to diplopia and by enlargement of the pupil), which requires a further neurological work-up. Reversible Horner's syndrome is reported to arise after epidural anesthesia in 0.4% to 2.5% of cases (e5). The probability of the development of a transient facial nerve palsy during pregnancy is 38–45 per 100,000 births, or three times higher than at other times [6].

Women undergo a tremendous number of changes, both systemic and ocular, throughout pregnancy. During pregnancy, physiological changes occur in the cardiovascular, hormonal, metabolic, hematologic, and immunologic systems (Thornburg et al., 2000; Sunness, 1988). Hormonal changes are among the most prominent systemic changes in pregnant women. The placenta, maternal endocrine glands, and fetal adrenal glands combine their productivity to make a high-powered hormone factory. The immune state is suppressed, leaving the pregnant woman more susceptible to serious immunological disorders (Sheth et al., 2001). By some of these mechanisms, pregnancy causes ocular changes, which may be more commonly transient but occasionally permanent. The ocular effects of pregnancy may be physiological, pathological, or modifications of pre-existing conditions. Visual changes in pregnancy are common, and many are specifically associated with the pregnancy itself. (Dinn et al., 2003). Thus, the aim of our study is ocular changes in pregnancy in north India.

Materials and Methods

It was a cross-sectional observational study carried out jointly in the Department of Ophthalmology and the Department of Obstetrics and Gynecology of Rani Durgawati Medical College, Banda, UP. Study subjects include 100 pregnant women (gestational period from 24 weeks to 38 weeks). Ethical clearance was obtained from the Institutional Ethical Committee, and written informed consent was obtained before carrying out the study.

Statistics Analysis

Mean ± SD were calculated for all the parameters to examine and were differentiated by percentage t using SPSS 16. *P-values were* considered significant.

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.

The evaluation of the patient included the following in each case

A complete ophthalmic history and medical history were taken. The measurement of the uncorrected and best-corrected visual acuities was done. Intraocular pressures were recorded using a non-contact tonometer. The anterior segment of both eyes was examined under the slit lamp biomicroscope. Corneal sensitivity was noted with the help of cotton. Dry eye evaluation was done with the help of the Schmeirs test, and manually binocular eye movement was observed. Fundus evaluation of both eyes was

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done through dilated pupils using a direct ophthalmoscope, and keratometry was done using a Bausch and Lomb keratometer. The data was expressed in the form of percentages.

Observation and Results

These 100 women, based on their analysis, showed a varied result. 38% showed clinically significant retinal changes with high blood pressure, leading to the categorical division of the pathological condition along with its physiological [table no. 1]. Physiological changes were seen in 78% of the patients [table no. 2]. 71 of these 100 showed papilledema [table no. 3].

Table No. 1: Percentage of ocular changes in pregnancy

Ocular changes	% of ocular change
Physiological changes only	22%
Physiological changes and diabetic retinopathy	15
Physiological changes and hypertensive retinopathy	30
Lid pigmentation with diabetic retinopathy	3
Papilledema	7
Diabetic retinopathy	6
Hypertensive retinopathy	9
Physiological changes and papilledema	8

Table No. 1 shows that the higher percentages of ocular changes are physiological changes and diabetic retinopathy; physiological changes alone; physiological changes and diabetic retinopathy; hypertensive retinopathy; physiological changes and papilledema; diabetic retinopathy; and Lid pigmentation with diabetic retinopathy (30, 22, 15, 9, 8, 7, 6, 3).

Table No. 2: Percentage of physiological ocular changes in pregnancy

Physiological Ocular Changes	% of ocular change
Lid pigmentation	68
Refrective error	18
Tear film alteration	6
Corneal curvature	8

Table 2 shows the physiological ocular changes in pregnancy: lid pigmentation, refractive error, corneal curvature, and tear film alteration. The percentage of ocular change was 68%, 18%, 8%, and 6%, respectively.

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Table No. 3: Patients with Papilledema

Patients with papilledema	**%**
Field loss	38
Transient visual loss	54
Reduced visual equanimity	8

Table 3 shows that the patients with papilledema have the most effect on transient visual loss, field loss, and reduced visual ecuity, respectively (54%, 38%, and 8%).

Discussion

It was a cross-sectional observational study carried out jointly in the Department of Ophthalmology and the Department of Obstetrics and Gynecology of Rani Durgawati Medical College, Banda, UP. Study subjects include 100 pregnant women (gestational period from 24 weeks to 38 weeks).

Our result found that the highest percentage of ocular changes were physiological changes and diabetic retinopathy, physiological changes only, physiological changes and diabetic retinopathy, hypertensive retinopathy, physiological changes and papilledema, diabetic retinopathy, and lid pigmentation with diabetic retinopathy (30, 22, 15, 9, 8, 7, 6, 3).

Physiological Ocular changes Changes in pregnancy were lip pigmentation, refractive error, corneal curvature, and tear film alteration. The percentage of ocular change was 68%, 18%, 8%, and 6%, respectively. Patients with papilledema have the most effects: transient visual loss, field loss, and reduced visual ecuity, respectively (54%, 38%, and 8%).

In pregnant women, various physiological changes take place due to hormonal effects in the placenta, such as increased estrogen, increased progesterone, and increased melanocyte-stimulating hormone. In pathological ocular conditions, discussing the ptosis that is seen is because of fluid and hormonal effects on the levator aponeurosis. An increased immune reaction in the lacrimal duct cell and dehydration due to nausea and vomiting are the causes of tear film alteration. Corneal changes that can increase thickness and reduce sensation are due to corneal edema. [7] This leads to refractive errors and contact lens intolerance. Hence, it is important to avoid new spectacle prescriptions and any refractive surgery.

Intraocular pressure was found to be lower among pregnant women. Retinal changes that are significant are either diabetic retinopathy or hypertensive retinopathy. The case of diabetic retinopathy is low-risk and disappears on blood sugar control, while on the other side, pre-eclampsia is the most common finding, followed by retinal arterial narrowing, followed by retinal hemorrhages and exudates, which also give rise to exudative RD. [8] 80 patients complained of headaches, among which ten had papilledema. The most common symptom of papilledema is transient visual obscuration, which is described as the dimming of vision in one or both eyes for up to 30 seconds. 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 eyes,

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starting in the nasal inferior quadrant, which progresses to the central visual field. Field loss tends to mimic glaucoma field loss. Visual acuity may also be affected. [9] An increase in headaches is caused by a surge of hormones during pregnancy, along with an increased volume of blood circulating throughout the body. [10]

Strengths and Limitations of the Present Study

There are a few limitations to the study. In the present study, only 24–38-year-old subjects participated in the research. Hence, in the feature, we would like to include an increase in the number of participants to reach a concrete conclusion. The present study had an impact on understanding about all pregnant women during the antenatal period should undergo a complete ophthalmic examination. Early detection of retinal changes in pregnancy can prevent serious complications.

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 the antenatal period should undergo a complete ophthalmic examination. Early detection of retinal changes in pregnancy can prevent serious complications.

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