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Original Research Article

Study of Physiological Ocular Changes in Pregnancy

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Abstract

Background: Women have a vast array of ocular and systemic changes during pregnancy. During pregnancy, the eyelid, conjunctiva, cornea, lens, retina, optic nerve/tract, and orbit are all affected. Increased pigmentation of the eyelids, ptosis, modifications to corneal and refractive status, and a drop in intraocular pressure are examples of physiological changes. Postpartum, these normally get better.

Aim: The aim of this study was to compare ocular alterations throughout the three trimesters of pregnancy and to assess the various physiological ocular changes occurring in pregnancy in women without additional co-morbid ocular or systemic disorders.

Materials and Methods: It is Observational Cross section study included first 300 pregnant women between the age group of 18 to 35years (100 from each trimester) presented to tertiary care hospital, Jamnagar for routine check-up.

Results: Total 300 women participated in this study. Out of 300 Pregnant Women 230 (76.66%) Women Show Physiological Ocular changes. These changes are more common in the age group of 21 to 30 years. Lid Cloasma and Occular Migrain are two most common Physiological Ocular changes seen in pregnancy. These changes are more common in first and second trimester as compared to third trimester.

Conclusion: Lid chloasma, Refractive error, Low intraocular pressure, Ocular migraine are more common physiological changes during pregnancy. These changes are more common in the age group of 21 to 30 years. Occular Migrain, Krukenberg Spindle, Low IOP, Lid Pigmentation are more common in first and second trimester as compared to third trimester.

Keywords: Cloasma Conjuctival Pigmentation, Krukenberg's Spindle, Intraocular Pressure Pregnancy.

Introduction

All organic systems are impacted by the complicated physiological process of pregnancy. Pregnancy-related alterations to the eyes might be either physiological or pathological. Any organ in the body can experience physiological changes, including the eye and visual system. Pregnancy causes a wide range of physiological and pathological changes in the ocular. During pregnancy, there may be changes to the

cornea's sensitivity, refractive state, intraocular pressure, and visual acuity [1,2].

There are very few papers that describe how pregnancy affects IOP alterations. Women with preeclampsia have elevated IOP in the peripartum period when compared to normotensive women. In patients with diabetes, ocular and systemic parasympathetic involvement manifests earlier than sympathetic involvement [3,4].

The interior of the eye and the outer ocular surface both undergo physiological changes during pregnancy. Numerous pathological changes, including central serous retinopathy and occlusive vascular disorders, as well as the progression of pre-existing pathologies, are connected to gestational hypertension. The administration of ocular medications may also change based on the route, which supports personalised decision-making [5-8].

An end organ that changes during pregnancy is the eye. Pre-existing eye conditions may become worse as a result of some of these changes, while other conditions may become apparent for the first time while pregnant. The primary care physician must have an early awareness of how to handle ocular disorders during pregnancy. Although it is thought that visual acuity impairment during pregnancy is a rare occurrence, ocular changes involve a wider spectrum of physiological and pathologic disorders, each of which may have a unique set of symptoms and treatment requirements [9,10].

Pregnancy-related ocular alterations are caused by physiological reactions to deal with the gestational product. While up to 15% of these pregnancy-related alterations are benign, the eyes may be impacted by a few pathological diseases [11,12]. On the other hand, the severity of these ocular changes is largely affected by the health status of the pregnant women, e.g. in a diabetic or hypertensive pregnancy

Material and Methods

The current study is an analysis of an observational cross section. In total, 600 pregnant women between the ages of 20 and 35 took part in the study. The current investigation was conducted as part of a normal check-up at a tertiary care hospital with an affiliated medical college. All of the study's female participants provided their written, informed consent. Prior to the study's launch, the institute's ethical committee was made aware of it and a clearance certificate was obtained.

Pregnant women having a known last menstrual cycle, regular antenatal checkups, no history of prior abortion, and no current or past refractive error or systemic disease met the inclusion criteria for the study. The subjects were not subjected to any financial burdens. Prior to the study, each subject was given a thorough explanation of its goal, the protocol's intent, and the method that would be employed before their agreement was obtained. Antenatal exams and a local examination of both eyes were done in addition to the standard lab tests.

Pregnant women with comorbidities such hypertension, diabetes, thyroid illness, and other systemic or ocular problems, as well as those who were older than 20 to 35 years old, were excluded from the study. Age, sex, occupation, and address were all recorded as demographic details. A thorough medical and ocular history was obtained. Both the best corrected visual acuity (BCVA) and the uncorrected visual acuity (UCVA) were measured. Noncontact Tonometry was used to measure intraocular pressures. Sterilization was performed on the foot plate of the plunger's lower end on the Schiotz tonometer. The patient was asked to lie supine on a coach and instructed to fix his or her eyes at a target on the ceiling after having the cornea anaesthetized with 4% topical xylocaine. The tonometer's foot plate was

then placed vertically on the centre of the cornea by gently separating the eyelids with the left hand.

As soon as the needle stabilised, the scale's reading was recorded. A drop of antibiotic was injected once the tonometer was raised. The IOP in mm of Hg was then calculated using the scale reading and plunger weight using a conversion table. The study's objectives were to examine and assess the numerous physiological ocular changes occurring during pregnancy in women who did not have any other ocular or systemic disorders.

Statistical Analysis

Microsoft Excel 2007 was used to compile and input the collected data, which was then exported to the data editor page of SPSS version 15 for analysis (SPSS Inc., Chicago, Illinois, USA). The level of significance and confidence level for each test were set at 5% and 95%, respectively. Unpaired Student's t-test for the difference of the means with unequal variances was used to statistically examine the data that was acquired.

Results

At 600 pregnant women in each of the first, second, and third trimesters of pregnancy, the IOP was measured. The three groups of pregnant women were distributed equally among them. The third trimester pregnant women's IOP was compared to that of the first and second trimester pregnant women. When compared to the second and first trimesters of pregnancy, the IOP decreased significantly (p 0.0001) in the third trimester.

Different ocular problems were diagnosed and noted in all the included pregnant women. The refractive error were seen in 130 patients, dry eye was noticed in 120 patients, oedema was noticed in 140 patients, in 200 patients ocular migraine was diagnosed, lid cholasma was noticied in 300 patients, and decreased IOP was noticed in 160 women. The age range of the included pregnant women was found to be 20 to 35 years. The maximum numbers of pregnant women with ocular problems were seen in 21 to 30 years age group. The minimum numbers of pregnant women with ocular problems were seen in above 30 years age group. The included 600 pregnant women were divided into three groups as per the three trimesters. In the first trimesters 200 women were included in the study, in second trimesters 200 women were included and in third trimesters 200 pregnant women were included in the group. The detail statistics of the different ocular changes in each of the trimesters were tabulated below.

Table 1: Statistics of different ocular changes in each trimester

	Refractive error	Dry eye	Corneal odema	Ocular migraine	Krukenbergs spindles	Lip pigmentation	Unilateral ptosis	Vow IOP
1st trimester	30	50	20	80	10	100	4	60
2nd trimester	50	20	80	60	30	140	6	80
3rd trimester	50	50	40	60	0	60	0	20
No change	470	480	460	400	560	300	590	440
Total	600	600	600	600	600	600	600	600

Discussion

The goal of the current study was to assess the numerous ocular alterations that occur during pregnancy in women who did not also have concomitant ocular or systemic disorders. Studies have shown that the release of placental hormones, maternal endocrine glands, and foetal adrenal glands can result in alterations. A fast referral to an ophthalmologist is necessary even though the majority of pregnancy-related eye issues are moderate, temporary, and don't require care. Additionally, several pregnancy-related ocular problems can offer a clear view into the pathogenesis of a number of systemic disorders [13,14].

Reactive changes in the retinal vasculature are present in nearly all pregnant women; however, clearly evident changes only appear in cases of hypertension, PE, or eclampsia. 3 40 to 100% of foetuses with gestational hypertension show varying retinopathy, however only 5–11% of them are symptomatic [15,16].

The extent of the hypertension is directly correlated with retinal abnormalities. Due to hormonal and circulatory changes during pregnancy, the IOP gradually drops from the second to the third trimester. The IOP may be maintained in part by the higher levels of oestrogen, progesterone, and other placental hormones that occur during pregnancy. Refraction is impacted by the tendency of fluid retention. Following delivery, the transient alterations in vision will go away [17,18].

Pregnancy has been linked to a number of changes in the body, including those to the eyes. These changes, along with any pre-existing ocular illnesses, can cause new changes as well as changes in the course of existing conditions. Our study's p-value of 0.0001 showed a correlation between the results of earlier research on both eyes.

The patients who have glaucoma may benefit from the drop in IOP.

In order to focus on the early detection and prevention of pre-eclampsia in pregnant women, it is crucial to be aware of the IOP changes during pregnancy in addition to the regular antenatal examinations.

Conclusion

Numerous physiological, clinical, and adjustments to already-existing ocular diseases are connected to pregnancy. Rarely do they result in lasting vision loss, and the majority of these go away in the postpartum period. Ophthalmologic therapy has, in the majority of situations, either in new or established conditions, reduced contraindications, with more advantages than hazards, particularly if a topical route of medication delivery is used.

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