REVIEW ARTICLE

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Eye in Pregnancy: A Unique Spectrum of Intraocular Changes in Pregnancy

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ABSTRACT:

Pregnancy plays an important role in altered physiological and pathological changes in the body during its course and eye being vital for its function undergoes varied changes in pregnancy, few of the remarkable changes noted are the central corneal thickness (CCT)increase and drop in the intraocular pressure(IOP), also modified mechanisms play a role in changing the previously existing pattern of diseases during pregnancy like diabetes mellitus, autoimmune diseases etc. Various ocular manifestations of pregnancy makes it an important screening stool as a part of comprehensive antenatal care for routine screening of pregnant women.

Keywords: CCT, Eye , IOP, Ocular Manifestation, Pregnancy.

INTRODUCTION

Pregnancy and its changes are vivid. Intraocular changes both physiological and pathological changes are noted during the course of pregnancy. Significant changes in eye has been supported by various studies from early 1970s. Changes could even appear for the first time in pregnancy itself.[1-6] Ocular changes can thus be a determining factor of pre-existing ocular disease or as a manifestation of systemic disease or even a factor for the development of a new pathology during the course of pregnancy.[2]

CORNEAL CHANGES

- Corneal sensitivity is decreased in late trimester in pregnancy and returns to normal by early weeks of postpartum. Corneal thickness variation is another manifestation with various mechanisms due to oedema which may result in a change in refractive index in cornea mostly increasing towards the last trimester.[1-6] Contact lens users may find it difficult to continue wearing contact lens during pregnancy due to these changes.[6,7]
- Significant variation in corneal curvature with increase during second and third trimester can occur and may resolve after delivery or cessation of breast feeding.[1]
- Corneal front steep keratometry value is statistically higher in the pregnant group.[9]
- Corneal biomechanical parameters during pregnancymay not be affected most times. A possible cause could be the maintained balanced effect of the action of different hormones on the cornea during pregnancy.[10]

INTRAOCULAR PRESSURE (IOP) & PREGNANCY

- IOP may affect women of childbearing age. A decrease in intraocular pressure has been observed during pregnancy and often persists for few months after delivery. A notable fall in the level of intraocular pressure could lead to decrease in IOP & cause changes for those women with pre-existing glaucoma showing an improvement of their condition, but medications should be continued.
- Possible mechanisms may include: increase in outflow, changes in systemic vascular resistance, reduction in episcleral venous pressure, increased tissue elasticity and variation in the corneoscleral rigidity bringing down the values of applanation tonometry. A reciprocal relationship could exists with the

central corneal thickness which may increase and affect the measured values of IOP.[1-12]

- Aqueous humour formation & its production remained stable, whereas IOP decreased throughout the trimesters and returned to normal levels at 3 months postpartum. Proposed mechanisms underlying the decrease in IOP during pregnancy indicate an association between female hormones and increased outflow.[15]
- A marked increase in aqueous outflow facility can be associated with progesterone levels in pregnancy. The decrease in IOP with the use of progesterone or the combination of progesterone and estrogen at pharmacologic doses is also reported. Another hypothesis suggests that excess progesterone during pregnancy acts as a glucocorticoid receptor antagonist and that it blocks the ocular hypertensive effect of endogenous steroids.[12]
- Glucocorticoid receptors are known to exist in the outflow apparatus; their inhibition would thus have an IOP-lowering effect.
- Intramuscularly administered relaxin, which is pregnancy-associated hormone, is shown to decrease IOP via increased outflow facility in both male and female patients with glaucoma. The effect of relaxin on outflow facility is thought to be mediated by collagen changes, which in turn affect the rigidity of Schlemm's canal and the trabecular meshwork.[11,12]
- Episcleral venous pressure has been reported to decrease in pregnant women could be associated with a decrease in general peripheral vascular resistance during pregnancy and might contribute to a decrease in IOP.[14,15]

REFRACTIVE ERRORS

Visual disturbances are found to have experienced a myopic shift from pre-pregnancy levels with a return to near pre-pregnancy levels post partum.[6]

Changes in refraction could be due the fluid retention. Hence spectacles or contact lenses may be temporarily either too weak or too strong depending upon patient's specific refractive errors.

PRE-EXISTING DIABETIC RETINO-PATHY

Progression of diabetic retinopathy (DR) can occur during the course of pregnancy.there is also evidence of adaptation of changes in pregnancy with a immunological response in DR.[2,9]

PREGNANCY AND PREECLAMPSIA

A pregnant woman should be evaluated for blurring of vision, photopsiasand diplopia. Conjunctival vascular anomalies to fundus changes like exudative retinal detachment, vitreous and pre-retinal haemorrhages, hypertensive retinopathy and ischemic optic neuropathy could be a spectrum in patients with PIH.

HORMONAL CHANGES & TUMOURS

Major hormonal changes emerge during pregnancy. Pituitary adenomas adversely affect the mother and foetus with risk of increased growth of the tumour.[2,7]

Bitemporal loss, concentric constriction, and enlarged blind spots are some of the patterns in visual fields. It could be asymptomatic and seen to be completely reversible, usually 10 days after delivery.[1-5]

Magnetic resonance imaging studies show that the size of the pituitary gland increases even during a normal pregnancy and thus damage the optic chiasm causing bitemporal visual field changes. Likewise, another cause of visual field damage could be of glaucoma or tumour.[7]

UVEITIS & POSTERIOR SEGMENT CHANGES

Flare up of conditions like Non-infectious uveitis can occur during early course of pregnancy with a comparative reduction in activity in later part of pregnancy and possible rebound phenomena in the postpartum period.[16]

Hypertensive,vascular disorders, central serous chorioretinopathy, uveal melanoma is seen to occur as a manifestation.

AUTOIMMUNE DISEASES AND PREGNANCY

A transient improvement in the disease pattern is noticed during the course of pregnancy and apparent worsening in the post-partum period probably due to the immune deviation promoting anti-inflammatory cytokines. It saves the foetus from immunological rejection.[8,16]

REACTIVATION OF PREXISTING CONDITIONS

Recurrence of ocular toxoplasmosis may occur. There is a risk of trans placental transmission. The virulence and the nature of transplacental route could cause the parasite infestation affecting the foetus. Pregnancy is associated with improvement of some autoimmune diseases including rheumatoid arthritis and multiple sclerosis and with exacerbation of other autoimmune conditions such as systemic lupus erythematosis.

THYROID DISEASE AND PREGNANCY

Thyroid hormone metabolism is altered with a change in disease pattern in Graves'disease. Second trimester onwards of pregnancy can present with amelioration of thyrotoxicosis.[1-5,16]

DEMYLINEATING DISEASE AND PREGNANCY

In Multiple sclerosis, patient is shown to have improvement with pregnancy. Relapse in the initial stages of postpartum may be linked to pattern with estrogen levels.[1-6]

OPHTHALMIC MEDICATIONS IN PREGNANCY

Topical beta blockers are to be avoided especially in the first trimester and stopped completely before the last to prevent beta blockade in the baby, they have a teratogenic effect. Carbonic anhydrase inhibitors are known to have teratogenic effects and should be avoided during pregnancy.[13-15]

Miotics appear to be safe during pregnancy whilst their toxicity during lactation is unknown. One exception is demecarium.

Prostaglandine analogues is also known to have contraindication.

Repeated use of Mydriatic drops should be avoided due to potential teratogenic effects of both parasympatholytics and sympatho-mimetic.

Breastfeeding mothers are not supposed be treated with mydriatics because of anticholinergic or hypertensive effects in the infant.

Corticosteroids are considered to be contraindicated even though there are no known teratogenic effects of topical steroids.

Erythromicin, tobramycin, gentamicin, polymyxin B and the quinolones with the latter two can be prescribed. Acyclovir is generally well tolerated in pregnant women. No known side effects of fluorescein and topical anaesthetics drops if used during pregnancy.

Chloramphenicol, systemic gentamycin, neo-mycin, rifampin is best avoided in pregnancy.[15]

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