



**ORIGINAL RESEARCH PAPER**

**Ophthalmology**

**BILATERAL SEROUS RETINAL DETACHMENT IN ECLAMPSIA: A CASE SERIES**

**KEY WORDS:** Eclampsia, Pre-eclampsia, Pregnancy Induced Hypertension, Bilateral Retinal Detachment.

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**ABSTRACT**

**AIM:** To report three cases of bilateral serous retinal detachment due to Eclampsia presenting in the Ophthalmology clinic in a tertiary care centre.  
**MATERIALS AND METHODS:** Three primi-parous women (Age : 18 to 20 years) presented to the emergency department after an episode of Generalized tonic clonic seizure in their third trimester of pregnancy. Their blood pressure were found to be elevated (Range : Systolic 130 – 150 mm of Hg, Diastolic 90-100 mm of Hg).  
**RESULT :** Re-attachment of the retina was found in all three patients with minimal retinal pigment epithelial changes. The visual acuity improved significantly when they were discharged from the hospital (Range 6/18 to 6/6) emphasizing the role of early diagnosis and appropriate management, thereby preventing visual morbidity in the patients of pre-eclampsia.

**INTRODUCTION**

Pre-eclampsia is a multisystem disorder characterized by abnormal vascular response to placentation<sup>(1)</sup>. The incidence of Pre-eclampsia is reported to be 5-8% and is defined by hypertension and proteinuria that also may be associated with other myriad signs and symptoms such as oedema, visual disturbances, headache and epigastric pain<sup>(2,3,4)</sup>. If symptoms and signs of preeclampsia are added with coma or convulsion it is called eclampsia<sup>(2,3,4)</sup>.

Pre-eclampsia is classified as a hypertensive disorder in pregnancy, which occurs in the absence of other causes of elevated blood pressure and in combination with generalized oedema, proteinuria or both. Prevalence of preeclampsia is 5% of first pregnancies.

1%-2% of patients with preeclampsia and 10% of patients with eclampsia have been reported with retinal detachment. Gestational hypertension cases in India is around one million cases per year. In United States Of America, preeclampsia and related hypertensive disorders of pregnancy impact 5-8% of all births.

As a result of increased sensitivity to circulating prostaglandins, severe vasospasm occurs throughout the body. 30% to 100% of pre-eclampsia patients have involvement of the visual system. Serous retinal detachment is a rare cause of visual loss in preeclampsia.

Pre-eclampsia is a clinical syndrome afflicting 3-5% of pregnancies. It is a leading cause of maternal mortality in developing countries.

**CASE 1**

20 years old Primiparous female on reported to the emergency department of Obstetrics and Gynaecology with complaints of headache and blurring of vision, followed by an episode of generalized tonic-clonic seizure. She had completed 37 weeks of gestation and was booked and immunized. Her blood pressure was found to be 140/100 mm of Hg.

Her blood urea was found to be 130 mg/dl, serum creatinine was found to be 5.8 mg/dl and random blood glucose value of

99 mg/dl. She was diagnosed as a case of Eclampsia, and was started on Magnesium sulphate regimen.

Her bedside Ophthalmic examination was conducted. Visual acuity in her right eye was 20/2000, left eye was 20/250. Both eyes had normal pupillary reaction, anterior segment in both eyes were normal. Fundus examination in both eyes showed clear media, optic discs with well defined margins of Vertical cup disc ratio of 0.3, serous retinal detachment of more than 2 disc diopters involving the macula with a blunted foveal reflex.

She was started on Topical Non-Steroidal anti-inflammatory drops (0.1 % Nepafenac) thrice daily dose. After obtaining emergency anaesthetic clearance, she was taken up for a emergency Lower segment Caesarean section, and an alive female baby was delivered. Her blood pressure normalized following the caesarean surgery. Her retinal detachment started improving from second post operative day.

**CASE 2 :**

A 20 year old Primiparous female was brought unconscious to the emergency department of the Obstetrics and Gynaecology, after an episode of seizure. Her blood pressure at admission was 170/100 mm of Hg, with blood urea level of 79 mg/dl, serum creatinine value of 1.2 mg/dl and random blood sugar level of 122 mg/dl.

Ultrasound examination revealed Abrution of placenta and intra uterine death of foetus. She was taken for emergency caesarean section and foetus was delivered. Her general condition was stabilized with Magnesium sulphate, anti hypertensives and anti epileptics.

Ophthalmic examination revealed visual acuity in right eye 20/2000 and left eye 20/2000. Pupillary examination and anterior segment examination of both eyes were normal. Fundus examination of both eyes had clear media, well defined optic discs of 0.4 vertical cup disc ratio. Both eyes has serous retinal detachment of more than 2 disc dioptres involving the macula. She was advised strict control of blood pressure with topical Non steroidal anti inflammatory medication (0.1% Nepafenac).

She had serial fundus examination during her stay at the hospital. At 6 weeks follow up visit, she had reattachment of retina in both eyes with visual acuity of 20/20 in both eyes.

She underwent serial ophthalmic examination during her stay at the hospital, and was treated with systemic anti hypertensive medications and topical NSAID drops. At 6 weeks follow, she had a visual acuity of 20/20 in both eyes with reattachment of retina in both her eyes.

**CASE 3 :**

18 year old primiparous female was brought by her mother to the emergency department after an episode of generalized tonic-clonic seizure. She complained of blurring of vision in both her eyes after waking up in the morning following which she developed seizure. She had completed 35 weeks of gestation .

On admission , her blood pressure was 130/100 mm of Hg. Her blood urea was 18 mg/dl, creatinine 0.6 mg/dl and blood sugar 69 mg/dl. She was taken up for emergency caesarean section after stabilization of her general condition and she delivered an alive pre-term female baby. 4 hours after surgery she developed epistaxis and cola coloured urine.

**HER BLOOD INVESTIGATIONS WERE AS FOLLOWS :**

Haemoglobin 5.4 grams, Total count 19010 ,Differential count 87/7/2.2, Platelets 57,000,Urea 79 mg/dl, creatinine 2.7 mg/dl, total Bilirubin 1.45, SGOT 533 units, SGPT 356 units, Alkaline phosphatase 199 units, Total protein 5.6 g, Globulin 3.2 gram.

Her ophthalmic examination revealed visual acuity of less than 20/200 in both eyes with normal anterior segment evaluation. Her fundus examination revealed bilateral serous retinal detachment involving the macula.

She was diagnosed as a case of Disseminated intravascular coagulation with HELLP ( Haemolysis, Elevated Liver enzymes and Low Platelets ) syndrome with Ante-partum Eclampsia. She was transfused blood and blood products with intravenous antibiotics. She was advised to continue systemic medications as advised by the physician , with topical NSAID drops ( 0.1 % Nepafenac ) thrice daily dosage. On fourth post op day her general condition improved and her blood values normalized.

She underwent serial retina examination during her stay at the hospital . At 4 weeks follow up visit, she had reattachment of retina in both eyes and she regained visual acuity of 20/20 in both eyes.

**DISCUSSION**

In normal pregnancy, the bulbar conjunctival vessels with mild arteriolar spasm is normal. Whereas in pregnancy induced hypertension , the vasospasm is severe and result in choroidal ischaemia.

The Severity of Pre-eclampsia can be assessed using ophthalmic arterial blood flow by Doppler analysis. In preeclampsia the increase of impedance of orbital vessels have been noted.<sup>(5)</sup> OCT has advantage of being non-invasive, breast feeding advantage, more sensitive than FFA and ICG in the pre-eclampsia.<sup>(6)</sup>

Proper antenatal follow up with early diagnosis of gestational hypertension and pre-eclampsia cases plays a great role in reducing the morbidity and mortality.

Retina examination is warranted even in Normotensive post-partum patients , who complains of blurring of vision, headache, nausea and vomiting to rule out possibility of serous retinal detachment.

Most patients with retinal detachment in pregnancy induced hypertension will have spontaneous resolution within a few weeks without any sequelae. Medical treatment with antihypertensive drugs and steroids is helpful.

The incidence of ocular symptoms in pregnancy induced hypertension is about 50%, whereas about 40% of people show retinal changes. The cause of sudden loss of vision in pregnancy induced hypertension is exudative retinal detachment with an incidence of up to 10% in eclampsia associated with pregnancy induced hypertension. The spasm of retinal arterioles associated with raised hypertension followed by retinal ischaemia leading to vascular leakage is the proposed mechanisms for development of pregnancy induced hypertension retinopathy. Earliest changes consists of nasal arterioles narrowing followed by generalized narrowing. Retinal oedema and exudation is usually marked and these may be associated with macular star or flat macular detachment.

Ocular symptoms in the form of blurring of vision, scotoma, amaurosis will be present in 50% of patients with pregnancy induced hypertension.

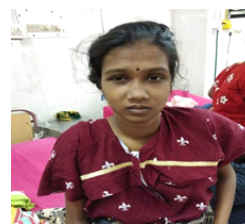
Retinal features like spasm of retinal arterioles, retinal haemorrhages, cotton-wool spots, hard exudates, macular oedema and serous retinal detachment are seen in pregnancy induced hypertension.

In hypoxic retinopathy in the form of cotton-wool spots, retinal oedema, haemorrhages should be considered an indication for termination of pregnancy. Otherwise permanent visual loss or even loss of life (both mother and foetus)

The choroidal vascularisation occurs in less than 1% of preeclamptic patients with slightly higher incidence in eclamptic patients. The commonest ocular finding in preeclampsia is severe arteriolar spasm, evidenced by either segmental or generalised constriction of the retinal arterioles which is reported in 70% of cases of toxemia.<sup>(2)</sup>

Retinal haemorrhages, oedema and cotton-wool spots, areas of nonperfusion or arterial or venous occlusive disease may also develop. In the pathogenesis of retinal detachment, an important role is played by the peripheral retinal degenerations, retinal ruptures, vitreo retinal tractions, detachment of vitreous cavity. Also retinal detachment cases are associated with myopic refraction and researches proved the existence of positive correlation between the frequency of retinal ruptures and bulbar axis length.

Retinal detachment in eclampsia or pre eclampsia may be associated with HELLP syndrome in which the pathophysiology for retinal detachment is micro angiopathic haemolysis.



18 years old primi antepartum eclampsia/ DIC with HELLP/ bilateral serous RD after recovery



Fundus photograph after Re-attachment of Bilateral serous RD



Not all pregnant women with preeclampsia will have HELLP syndrome. HELLP syndrome can occur without high BP or proteinuria. Majority within first 48 hrs of delivery develop HELLP syndrome. 30 percent of HELLP syndrome develop after delivery. The time of onset HELLP varies from few hours to 7 hrs after delivery.

The changes in the ion transport function and fluid in the retinal pigmentary epithelium underlying the neurosensory retina play an important role in sub retinal fluid generation and consequent serous retinal detachment. Under normal physiological function of retinal pigmentary epithelium is capable of pumping the great amount of fluid and other metabolic products , out of neuro epithelium. RPE function is greatly influenced by the choroidal circulation.<sup>(7)</sup>

In the pre eclamptic state, vasoconstriction leading to choroidal ischaemia. Ischaemia of the chorio-capillaries is the underlying mechanism which leads to compromised fluid transport by the RPE, accumulation of subretinal fluid and consequent serous neurosensory detachment.<sup>(1)</sup>

In preeclampsia the increase of impedance of orbital vessels have been noted.<sup>(6)</sup> Angiography shows that the retinal detachment is due to chorio-capillaries and choroidal arterioles occlusion. Following resolution of retinal detachment, an alteration in the form of hyper and hypo pigmentation, which corresponds to chorio-capillaries ischaemic strokes (Elschnig spots) are found.<sup>(6)</sup>

Severe preeclampsia and eclampsia are major causes of maternal and perinatal morbidity and mortality. The blindness may be due to involvement of occipital cortex or the retina. Cortical blindness with incidence of up to 15% in eclampsia associated with pregnancy induced hypertension. Involvement of Choroidal vascularisation result in unusual cause of visual loss in pre-eclampsia. This complication occurs in less than 1% of cases of pre- eclampsia and slightly higher in eclamptic patients.

The retinal detachment usually occurs in preeclampsia or eclampsia in the absence of significant retinal abnormalities or retinal rupture.

The exact pathophysiology of serous neurosensory detachment in preeclampsia is not known. It is probably changes in ion transport and fluid function of the retinal pigment epithelium underlying the neurosensory retina play an important role in generation of subretinal fluid and serous detachment formation. RPE pump fluid and other metabolic products out of neuroepithelium.

Vasoconstriction leads to Choroidal ischaemia and Choroidal dysfunction, primarily chorio-capillaries ischaemia leads to compromised fluid transport by the RPE, accumulation of subretinal fluid leading to serous neurosensory detachment.<sup>(7,9)</sup>

Increase of impedance of orbital vessels also noted in severe form of eclampsia by Doppler due to alteration of choroidal vasculature in preeclampsia FFA may show retinal damage. Occlusion of choroidal arterioles and chorio capillaries during resolution of retinal detachment irregular focal areas of hyper and hypo-pigmentation corresponding to areas of chorio-capillaries called Elschnig pearls<sup>(5)</sup>.

OCT is more sensitive than FA and ICG for evaluation of macula Choroidal ischemia in pre-eclampsia<sup>(8)</sup>

**CONCLUSION**

The interest of knowledge of preeclampsia and eclampsia by ophthalmologist is in priority to save the vision and life of the mother and the foetus, without any sequelae most of the detachment will resolve with spontaneous resolution over a few weeks. Hence medical treatment with antihypertensive drugs and steroids are helpful in case of exudative retinal detachment develop in eclampsia patient or in intrapartum eclampsia patient.

**DECLARAION OF INTEREST**

The author declares that there is no conflict of interest.

**REFERENCES :**

1. Preeclampsia : Pathophysiology, diagnosis and management. Jennifer Uzan et al. Dovepress Manual:Vascular Health and risk management 18 July 2011
2. Wagner HP. Arterioles of retina in toxemia of pregnancy, JAMA 1933:101; 1380-1384
3. Hypertensive disorders in pregnancy :William Obstetrics 25 th edition , New York McGraw-Hill, 2001;567-618.
4. Pregnancy outcomes in healthy Nulliparas who developed hypertension. Calcium for preeclampsia prevention study group. Obstet-Gynaecol 2000: 95 ;24-28.
5. Ober RR. Pregnancy- induced hypertension (preeclampsia-eclampsia) In:Ryan SJ (ed). Retina. Vol 2 2nd ed. St Louis : Mosby;1994, pp.1405-1411.
6. Diagnosis and management of Preeclampsia and eclampsia : ACOG Practice Bulletin : Clinical Management Guidelines for Obstetrics and Gynaecologist : number 33, January 2002.
7. Spaide RF, Goldbaum M ,Wong DWK , Tang KC , Iida T. Serous detachment of the retina . Retina 2003;23(6);820-846
8. Gabor MS, Kata M, Ester T, Janos R Jr. Diagnosis of serous neuro-retinal detachments of the macula in severe preeclamptic patients with optical coherence tomography. Hypertens Pregnancy. 2006;25:11-20
9. Saito Y, Tano Y. Retinal pigment epithelial lesions associated with Choroidal ischemia in preeclampsia. Retina 1998;18:103-108.