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Case Report

Blinding clues: unveiling the ocular manifestations of preeclampsia

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ABSTRACT

Preeclampsia is a hypertensive disorder of pregnancy that significantly contributes to maternal and fetal morbidity and mortality. Although its hallmark manifestations include hypertension and proteinuria, systemic complications affecting various organs, including the ocular system, are often under-recognized. Ocular manifestations range from mild visual disturbances to severe complications such as cortical blindness and retinal detachment. These complications reflect the systemic endothelial dysfunction and vascular permeability characteristic of preeclampsia. Early recognition of ocular symptoms can serve as a valuable indicator of disease severity and progression, prompting timely intervention. In this case, a 37-year-old gravida 2, para 1, at 30+6 weeks of gestation presented with severe hypertension (200/110 mmHg), headache, and loss of vision. A diagnosis of posterior reversible encephalopathy syndrome (PRES) was suggested, likely secondary to cerebral edema associated with preeclampsia. The patient underwent emergency lower-segment caesarean section (LSCS) after stabilization with intravenous Labetalol and magnesium sulphate ($MgSO_4$). Postoperatively, her visual symptoms resolved within six hours, and an ophthalmological evaluation revealed a normal fundus examination. This case shows the importance of recognizing preeclampsia-induced ocular changes, as timely intervention can prevent irreversible complications such as optic neuropathy and permanent vision loss. Multidisciplinary management, including obstetric and ophthalmologic care, is critical to achieving favorable maternal and fetal outcomes. Routine monitoring and ophthalmological evaluations in high-risk pregnancies are essential to early detection and effective management. This case highlights the reversible nature of preeclampsia-induced ocular complications and emphasizes the role of expedited delivery in mitigating severe outcomes.

Keywords: Hypertensive disorder, Fetal morbidity, Preeclampsia

INTRODUCTION

Preeclampsia, a hypertensive disorder of pregnancy, is a leading cause of maternal and fetal morbidity and mortality worldwide. It is characterized by the onset of hypertension and proteinuria after 20 weeks of gestation, with potential systemic complications affecting the liver, kidneys, central nervous system, and ocular system. Although less commonly emphasized, ocular manifestations are important indicators of disease severity and progression in preeclampsia. They may include visual disturbances, hypertensive retinopathy, retinal detachment, retinal hemorrhage, and optic neuropathy.[1] In some cases, these changes may precede or accompany systemic deterioration, serving as early warning signs for severe complications such as eclampsia.[2]

The pathophysiology of preeclampsia-induced ocular changes is thought to stem from widespread endothelial dysfunction, increased vascular permeability, and microvascular ischemia. These mechanisms are consistent with the systemic nature of preeclampsia, wherein the ocular system serves as a microcosm reflecting broader vascular disturbances. Retinal changes, such as arteriolar narrowing, cotton-wool spots, and retinal edema, are frequently reported and can vary in severity depending on the degree of systemic hypertension.[3] Serous retinal detachments, although rare, is associated with significant

morbidity and often occurs in severe cases of preeclampsia. Other complications, such as cortical blindness and optic neuropathy, are less common but depict the importance of thorough ocular evaluation in affected patients.[2,3]

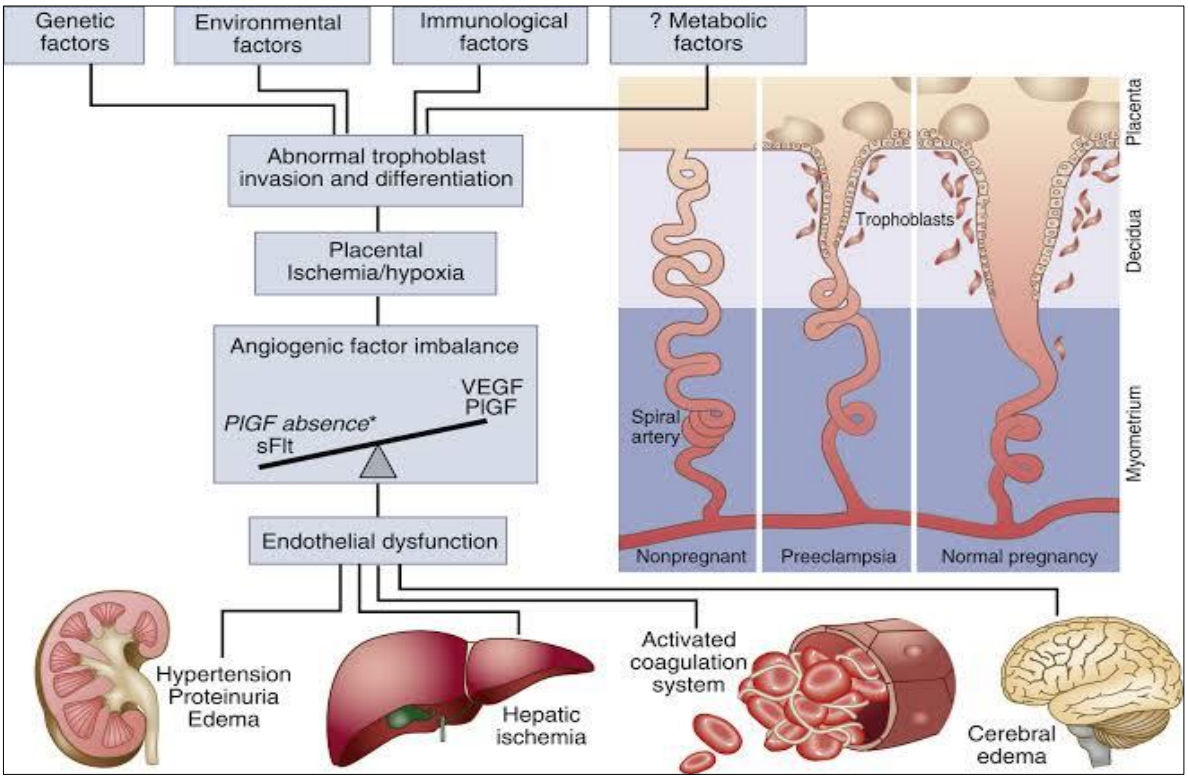

Figure 1: The pathophysiology of preeclampsia-induced ocular changes.

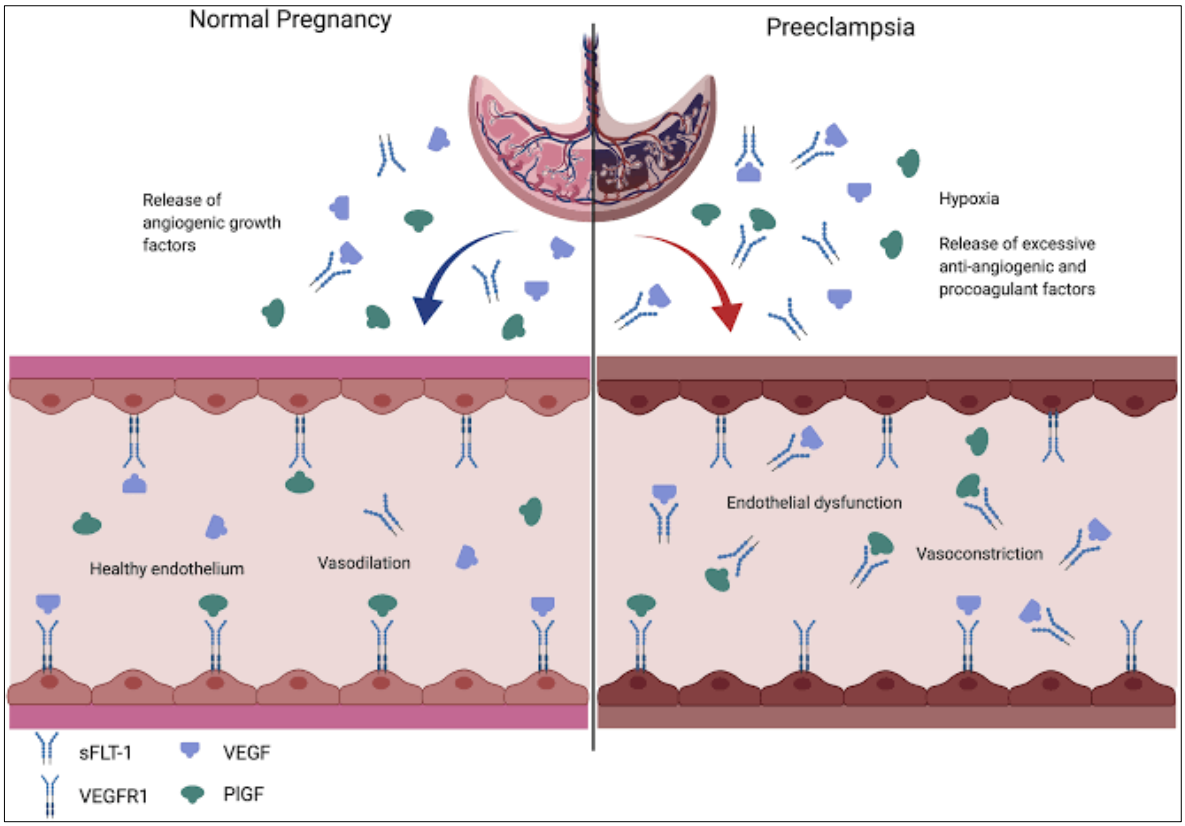

Figure 2: Normal preganacy Vs. preeclampsia-induced pregnancy.

The clinical implications of preeclampsia-induced ocular changes are substantial. Visual symptoms, including blurring, photopsia, or field defects, may serve as important clues to underlying disease severity.[1] In some cases, these symptoms can prompt timely medical interventions, preventing permanent damage. The reversibility of ocular changes following delivery highlights the transient nature of these complications in most cases; however, delayed or inadequate management may lead to irreversible visual impairment or blindness.[1,2] Consequently, a multidisciplinary approach involving obstetricians and ophthalmologists is crucial for optimal management.[2]

This case report aims to document the ocular manifestations in a patient with preeclampsia, contributing to the growing body of literature on this topic. By detailing the clinical presentation, management strategies, and outcomes, this case report seeks to improve the understanding of preeclampsia-induced ocular changes and emphasize the importance of early recognition and intervention. Enhanced awareness among healthcare providers is essential for reducing the burden of preventable visual disability associated with this condition. Moreover, the integration of routine ophthalmological evaluation into the care of preeclamptic patients could offer significant benefits, particularly in resource-limited settings where severe complications are more prevalent.[3]

CASE REPORT

Mrs. X, a 37-year-old, second gravida, previous LSCS, booked in Vijaya Hospital from 49 days of amenorrhoea, presented with complaints of headache for six hours and loss vision for one hour at 30 weeks + 6 days of gestation

Obstetric history

First pregnancy (2013)

Full-term LSCS performed due to fetal distress, resulting in a healthy male infant weighing 2.4 kg. The antenatal and postnatal periods were uneventful.

Second pregnancy (current)

A spontaneous conception, at booking - ECHO, renal function test, kidney, ureters, bladder (KUB), and fundus were examined and were found to be normal.

In view of her age and gestosis score, she was started on tablet ecospirin 150 mg 0-0-1. Non-invasive prenatal testing (NIPT) showed low risk for trisomies 13, 18, and 21.

Routine supplements of folic acid, calcium, and iron were taken. The patient was immunized with injection dT and injection dTap. An anomaly scan revealed no gross abnormalities, and glucose tolerance tests (GTT) was normal.

At 28+5 weeks of gestation, a growth scan was normal, Doppler - normal. However, elevated blood pressure was noted at 29 weeks, BP- 140/100 mmHg, all blood parameters - normal and no proteinuria and the patient was started on tablet labetalol 100 mg (thrice daily). Steroid prophylaxis given at 30 weeks.

Mrs. X presented to emergency department with a severe headache and loss of vision. On admission, bilateral pitting pedal edema was present (grade 2), pulse rate: 96/min, and blood pressure: 200/110 mmHg.

The patient was administered intravenous labetalol (20 mg bolus), $MgSO_4$ loading dose given. Initial resuscitation of mother and baby done. Admission NST – reactive.

The patient was stabilized and underwent an emergency LSCS. A male infant weighing 1 kg was delivered at 30+6 weeks, with Apgar scores of 8/10 and 9/10. Postoperatively, her vision improved within six hours. She was administered a loading dose and maintenance dose of $MgSO_4$ for seizure prophylaxis. An ophthalmology evaluation revealed a normal fundus examination. Postnatal patient had elevated BP and was on antihypertensives for 6 weeks.

DISCUSSION

Preeclampsia, a hypertensive disorder unique to pregnancy, is characterized by its systemic effects on multiple organs, including the ocular system. Although primarily recognized for its hypertensive and proteinuric manifestations, preeclampsia frequently involves ocular changes, which can range from mild visual disturbances to severe complications such as cortical blindness or retinal detachment.[4,5] This case highlights the critical importance of recognizing these ocular manifestations as indicators of disease severity and the need for prompt intervention.

The patient in this case presented with acute severe hypertension (200/110 mmHg) and loss of vision. These symptoms are consistent with posterior reversible encephalopathy syndrome (PRES), a condition associated with endothelial dysfunction and cerebral edema.[6] PRES is a recognized complication of preeclampsia and eclampsia, often presenting with headaches, seizures, and visual disturbances. In this patient, the transient nature of her visual symptoms, along with a normal fundus examination, suggests cerebral edema as the primary cause, which resolved post-delivery.

Ocular changes in preeclampsia are believed to result from the interplay of systemic hypertension, endothelial dysfunction, and vascular permeability, leading to ischemic changes in the retina and choroid. Retinal manifestations, such as arteriolar narrowing, hemorrhages, and cotton-wool spots, are common in preeclampsia and

serve as critical markers of disease severity.[7,8] While the patient's fundus examination was normal, the clinical presentation aligns with broader cerebrovascular involvement rather than localized retinal pathology.

Management of preeclampsia-induced ocular changes primarily focuses on controlling blood pressure, preventing seizures, and ensuring timely delivery. This patient was managed with intravenous Labetalol to lower her blood pressure and $MgSO_4$ to prevent seizures, which are critical components of preeclampsia management.[9,10] The decision to perform an emergency LSCS at 30+6 weeks' gestation, in conjunction with antenatal steroid prophylaxis for fetal lung maturity, emphasizes the necessity of balancing maternal stabilization with fetal viability.

The rapid resolution of visual symptoms post-delivery highlights the reversible nature of preeclampsia-associated ocular complications, particularly those related to cerebral edema.[3,8] This outcome emphasizes the importance of prompt recognition and management to prevent irreversible complications such as optic neuropathy or retinal detachment, which may result in permanent vision loss. Multidisciplinary care involving obstetricians, ophthalmologists, and neonatologists is crucial for achieving favourable outcomes for both mother and child.

A study by Nandi et al explored ocular complications associated with hypertensive disorders during pregnancy.[11] Retinal sensitivities was significantly reduced in patients with gestational hypertension and preeclampsia, often correlating with systemic vascular changes. Hypertensive retinopathy was the most common finding, characterized by retinal hemorrhages, exudates, and cotton-wool spots, mirroring the systemic pathology of endothelial dysfunction and microvascular ischemia. Similar to the current case, the timely management of blood pressure prevented permanent visual damage in many cases.

Martins et al described a patient presenting with bilateral serous retinal detachment during severe preeclampsia.[12] This rare complication was attributed to choroidal ischemia and capillary leakage. Post-delivery, retinal attachment was restored, demonstrating the reversibility of preeclampsia-induced ocular changes when managed promptly. This aligns with the current case where visual symptoms resolved after delivery. Another case study by Akram et al focused on the incidence of transient cortical blindness in patients with preeclampsia.[13] This condition, caused by PRES, is consistent with the symptoms observed in the present case. PRES is typically reversible with appropriate antihypertensive therapy and delivery. The findings reinforce the role of early detection and management to prevent long-term complications.

Further supporting evidence comes from Rozhin et al, who reported a series of cases with preeclampsia-induced hypertensive retinopathy and choroidalvasculopathy.[14] They emphasized that regular fundoscopic examinations during pregnancy can identify these complications early and facilitate prompt intervention, as highlighted in the current case.

This case also illustrates the importance of early screening and ongoing monitoring in high-risk pregnancies. Regular blood pressure monitoring, along with assessment of visual symptoms, can aid in the early detection of complications. Additionally, the integration of ophthalmologic evaluations in patients presenting with visual disturbances may provide valuable insights into disease progression and guide management decisions.

CONCLUSION

Preeclampsia, a complex hypertensive disorder of pregnancy, presents a significant challenge to maternal and fetal health. The systemic effects of the condition, including its impact on the ocular system, underline the need for timely recognition and intervention. This case highlights the importance of identifying ocular manifestations, such as visual disturbances and signs of PRES, as indicators of disease severity. The rapid resolution of visual symptoms following delivery demonstrates the reversible nature of preeclampsia-induced ocular complications, provided that the condition is managed appropriately. This case highlights the critical role of a multidisciplinary approach, involving obstetricians, ophthalmologists, and neonatologists, in ensuring optimal maternal and fetal outcomes. Timely blood pressure control, seizure prophylaxis, and expedited delivery remain the cornerstone strategies for mitigating the risks of severe complications, including irreversible vision loss. Routine screening and continuous monitoring of high-risk pregnancies, including ophthalmologic evaluations for visual disturbances, patient education regarding visual disturbances are vital for early detection and management of preeclampsia-related complications. By enhancing awareness and implementing comprehensive care strategies, the burden of preventable maternal and neonatal morbidity and mortality associated with preeclampsia can be significantly reduced. This case serves as a reminder of the necessity of prompt, individualized care in high-risk pregnancies to optimize outcomes and improve quality of life for both mother and child.

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