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Case Report

Isolated sixth cranial nerve palsy as the first manifestation of pre-eclampsia with twin pregnancy-case report and review of literature

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ABSTRACT

Sixth cranial nerve palsy can occur either during or after gestation, and is often associated with hypertensive disorders of pregnancy. We report a case of a 39-year-old hypertensive primigravida with a twin pregnancy, who suddenly developed double vision in her second trimester. She was diagnosed to have isolated sixth cranial nerve palsy in her left eye. Her anterior and posterior segment examination, as well neurological imaging, were found to be entirely within normal limits. She was subsequently admitted with severe pre-eclampsia and haemolysis, elevated liver enzymes, and low platelet count (HELLP) syndrome, and managed conservatively. The prognosis is usually favorable in such cases, with the palsy resolving as the blood pressure normalizes after delivery. This case demonstrates isolated abducens nerve palsy as the first sign of pre-eclampsia at 30 weeks of gestation.

Keywords: Pre-eclampsia, Pregnancy, Hypertension, HELLP

INTRODUCTION

Hypertensive disorders of pregnancy include gestational hypertension, pre-eclampsia, eclampsia, and HELLP syndrome. They affect 2-8% of pregnancies worldwide and contribute to approximately 16% of maternal mortality.[1] Severe headache, mental fatigue, dizziness and blurring of vision are common neurological symptoms associated with hypertensive disorders of pregnancy.[2] Isolated sixth cranial nerve palsy is a rare complication of hypertensive pregnancies.

The exact pathophysiology is ambiguous, but has been proposed to occur as a consequence of transient ischemia, due to vasospasm of the vasa nervosum.[3] We report a case of a primigravida with pre-eclampsia and HELLP syndrome, who developed isolated sixth cranial nerve palsy as the first sign of pre-eclampsia.

CASE REPORT

A 39-year-old primigravida presented to the eye department with double vision for one day. She was in the 30th week of her gestation, carrying twins, and had conceived via in vitro fertilization. She reported a brief history of cough and cold over the past three days, for which she had received symptomatic treatment. She also had a prior history of hepatitis B infection.

At presentation, her blood pressure was recorded at 140/90 mm of Hg. Her best corrected visual acuity was 6/6, N/6 in both eyes with a refraction of -0.75DS. On evaluating her extra-ocular movements, she was observed to have a limitation of abduction in her left eye (Figure 1). Diplopia charting documented horizontal uncrossed diplopia, which increased on her left gaze. Slit lamp bio-microscopy and fundus examination (Figure 2) were unremarkable. A neurologist's opinion was sought to evaluate the cause for

the sixth cranial nerve palsy. A magnetic resonance imaging (MRI) brain was ordered, which was found to be entirely within normal limits. In the absence of any other cause, a diagnosis of preeclampsia-induced isolated sixth cranial nerve palsy was made. No specific treatment was given for the sixth cranial nerve palsy. A detailed obstetric examination was done, after which she was advised admission to monitor her blood pressure. However, she refused. Three days later, she presented with a blood pressure of 180/100 mmHg and proteinuria. She was admitted for further management, after which she developed HELLP syndrome. An urgent caesarean section was done, ending the gestation prematurely. She gave birth to two pre-term twins who were then admitted in the neonatal intensive care unit (NICU) for resuscitation. At her first follow-up after a week, the diplopia had started to improve spontaneously with regression in sixth cranial nerve palsy. A complete resolution of cranial nerve function occurred after the four weeks, with no residual palsy.

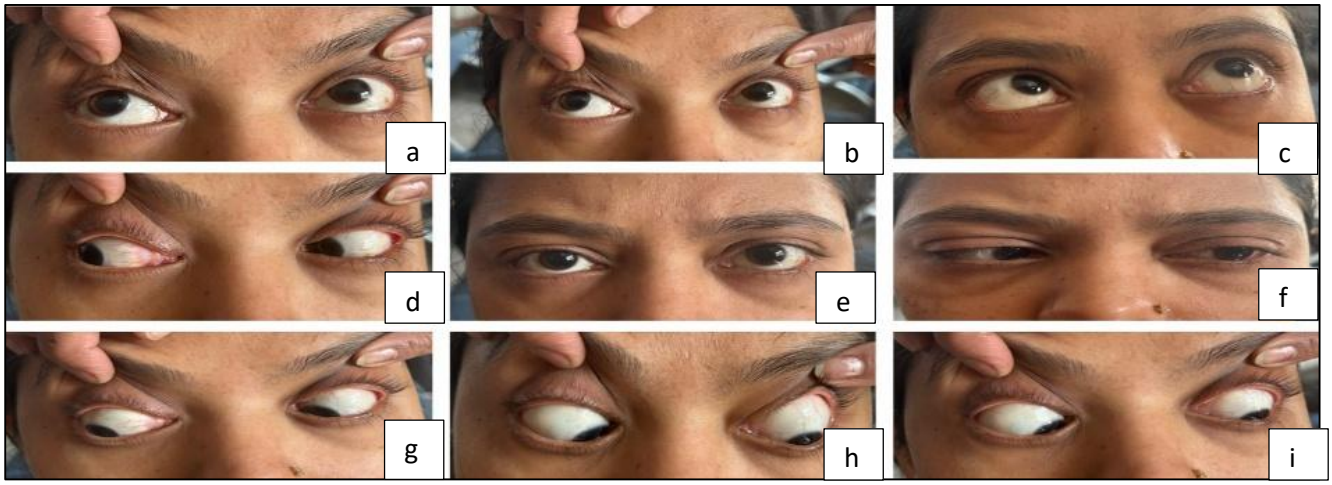

Figure 1 (a-i): Limitation of abduction in left eye.

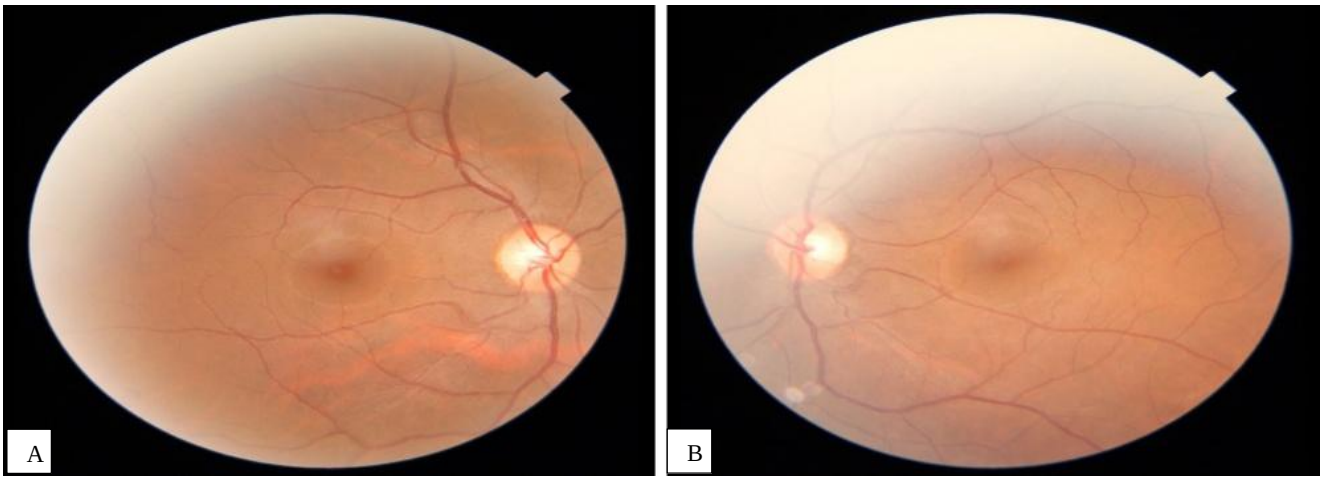

Figure 2 (A and B): Normal fundus images of both eyes.

DISCUSSION

Preeclampsia is a disease of pregnancy that is classically characterized by new-onset hypertension and proteinuria occurring after 20 weeks of gestation and continuing through to the postpartum period.[4] The presentations of pre-eclampsia range from severe pre-eclampsia to HELLP syndrome, affecting cardiovascular, hepatorenal, hematologic, neurologic, and visual systems.[5] Sixth cranial nerve palsy is an infrequent complication of hypertensive disorder in pregnancy, documented only as anecdotal case reports (Table 1), and can present as the first sign of pre-eclampsia.[6] The exact pathophysiology is uncertain, but several theories have been brought forth, in an attempt to understand this condition. A bleed or infarction at the level of the abducens nerve nucleus has been proposed as a cause by some authors.[7] Another more widely accepted theory states that vasoconstriction induced by pre-eclampsia can result in vasospasm of the vessels supplying the sixth cranial nerve, thereby producing ischemia and paralysis of the nerve.[8] A few authors also suggest inflammation of the nerve fascicles due to inflammatory mediators, and/or a downward displacement of the sixth nerve as a consequence of increased intracranial pressure.[9]

Table 1: Documented case reports of abducens nerve palsy during pregnancy.

Authors	Age at presentation (in years)	Gravida	Period of gestation at presentation (in weeks)	Associated pathology
Sternberg et al[11]	25	1	24 weeks	Pyrexia
Barry-Kinsella et al[12]	33	2	38 weeks	Preeclampsia
Rassekh et al[13]	21	Data not available	27 weeks	Fungal sinusitis
Fung et al[14]	26	1	38 weeks	Gestational hypertension
Jacob et al[15]	32	Data not available	26 weeks	Arachnoid cyst
Thamban et al[16]	34	2	40 weeks	None
Tumbull et al[17]	28	1	37 weeks	Preeclampsia
Vallejo-Vaz et al[7]	36	2	36 weeks	Gestational hypertension
Gosavi et al[18]	31	1	38 weeks	Central pontine myelinosis
Yousefi et al[9]	40	3	39 weeks	Preeclampsia
Guerrero et al[3]	31	1	37 weeks	Preeclampsia
Rengaraj et al[19]	25	Data not available	37 weeks	Preeclampsia and aseptic cavernous sinus thrombosis
Caputo et al[20]	35	1	37 weeks	Migraine
Sebastian et al[6]	26	1	35	Preeclampsia

In the young adult population, the most common risk factors associated with sixth cranial nerve palsy are hypertension, atherosclerosis and diabetes. The most commonly reported aetiologies for sixth cranial nerve palsy include vasculopathy (29%), tumours (16%), multiple sclerosis (12%), inflammation (8%), trauma (6%), post-lumbar puncture (4%), and orbital amyloidosis (2%), while another 22% of cases remain idiopathic.[10] Our patient showed none of the above pathologies, hence was diagnosed to have preeclampsia-induced isolated sixth cranial nerve palsy.

Sixth cranial nerve palsy in pregnancy appears to resolve without any specific treatment. It is a self-limiting condition, which shows regression in paresis, once the underlying pathology is tackled.[10]

CONCLUSION

Though it runs a benign course, isolated abducens nerve palsy must be viewed with caution, as it could portend serious consequences like eclampsia and progressive reversible encephalopathy syndrome (PRES), requiring a multi-systemic approach to safeguard the health of the mother and child.

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