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Unusual Presentation of Posterior Reversible Encephalopathy Syndrome After Spinal Anesthesia for Cesarean Section: A Case Report

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ABSTRACT

Background: Headache after spinal anesthesia (SA) is usually attributed to post dural puncture headache (PDPH). We report a case of posterior reversible encephalopathy syndrome (PRES) after spinal anesthesia to a normotensive pregnant patient presented for cesarean section (CS).
Case presentation: A 33-year-old pregnant woman underwent a CS under SA. The patient was obese, had gestational diabetes mellitus with a history of two spontaneous abortions and had a history of one uneventful CS. Immediately after the SA, the patient developed an acute severe headache relieved with medical treatment.
The patient complained after 8 hours postoperatively of headache, sudden blurred vision which was followed by a generalized tonic-clonic seizure treated by intravenous midazolam and magnesium sulfate. The headache and visual disturbance resolved completely one hour later. The MRI suggested the diagnosis of PRES.
Conclusion: We hereby contribute to the literature an uncommon neurological disorder, the PRES, occurred in a normotensive parturient.

Keywords: Posterior reversible encephalopathy syndrome, headache, pre-eclampsia, eclampsia, spinal anesthesia, post dural puncture headache.

INTRODUCTION

Spinal anesthesia is the most commonly used anesthesia technique for cesarean delivery. Post spinal puncture headache (PSPH) is a well-known complication of SA. It is a common and incapacitating complication following dura-arachnoid puncture [1, 2]. In addition, PSPH may occur immediately after puncture [3].
The differential diagnosis of headaches in pregnancy includes the primary headaches (Tension type headaches, Migraine, Cluster headache) [4,5], and the secondary headaches (Hypertension/Pre-eclampsia, Idiopathic intracranial hypertension, Subarachnoid hemorrhage, Cerebral venous thrombosis, Reversible cerebral vasoconstriction syndrome, Posterior reversible encephalopathy syndrome) [6, 7, 8, 9]. The pathology of PRES is related most commonly to pregnancy-related hypertensive disorders. Other conditions could induce the onset of PRES in normotensive patients like systemic lupus

erythematosus, chronic renal failure, rheumatoid arthritis, immune suppressive medications, anti-neoplastic agents, severe hypercalcemia, thrombocytopenic syndromes, Henoch-Schonlein purpura, hemolytic uremic syndrome, amyloid angiopathy, various causes of renal failure, regional anesthesia, sepsis, toxic agents especially chemotherapy, and drugs such as cocaine and methamphetamine [10, 11].

PRES is a rare clinic and neuroradiological entity introduced as late as 1996 by Hinchey et al [12]. Clinical features include headache, encephalopathy, seizures, and cortical visual disturbances or blindness. Neuroimaging shows parieto-occipital white and grey matter change [13, 14]. We report a rare case of PRES to a normotensive pregnant patient post cesarean section under SA.

CASE REPORT

A 33-year-old woman (gravida 4, para 1), ASA III is admitted for elective CS. According to the estimated due date of ultrasound in the first semester, the gestation age was 39 weeks and 3 days. The patient is obese (BMI= 31.59 Kg/m^2) and has a gestational diabetes mellitus controlled by metformin. The parturient has no hypertensive disorder, no comorbidities, and no history of smoking or substance abuse. Her obstetric history was an uneventful CS under spinal anesthesia four years ago and two miscarriages under general anesthesia.

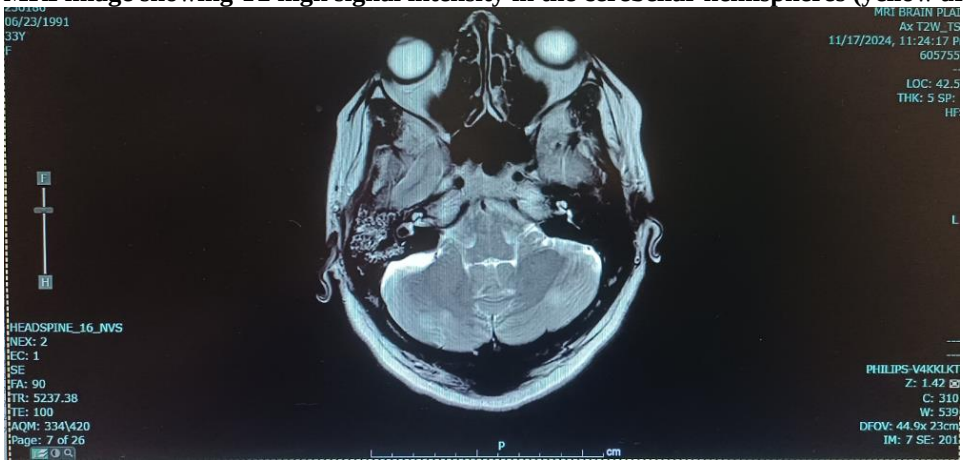
The patient never showed any trace of proteinuria. The blood laboratory investigations made before the CS were normal. Pre-spinal anesthesia non-invasive blood pressure was 118 mmHg systolic and 67 mmHg diastolic. The heart rate was 108 beats per minute, the respiratory rate was 16 per minute, and her oxygen saturation was 100% on nasal oxygen 4 l/minute. The SA was uneventful except of the occurrence of a severe headache 5 minutes after. The patient's vitals remained within the normal range. A normal weight female baby was extracted (APGAR score at 1 minute and 5 minutes were respectively equal to 8 and 10). Paracetamol and midazolam were administered intravenously and a total of 1000 ml of Ringer's lactate was infused during the entire procedure which lasted for 1 hour. Postoperatively, she was shifted to a post-anesthesia care unit where her headache resolved partially for a pain visual scale equal to 3.

8 hours after delivery, the patient reported experiencing a sudden blurred vision and recurrence of her headache rated on the visual scale equal to 8. The patient's vitals remained unchanged and the neurological exam was normal. The pupils were equal and reactive to light, the fundoscopy was normal. A complete blood count (CBC), coagulation profile, LDH, blood sugar, serum electrolytes, liver function test (LFT), renal function test (RFT), urine analysis, and MRI of head were ordered.

The patient developed few minutes after a generalized tonic-clonic seizure treated by intravenous midazolam and magnesium sulfate. The headache and visual disturbance resolved completely within one hour. Blood tests and urine analysis suggested no abnormalities. These findings were followed by a MRI head which showed small foci of signal abnormality affecting the grey and white matter of both cerebellar hemispheres, without restriction of diffusion or associated brain edema. The findings were suggestive of PRES. Fig 1.

The patient was explained about the diagnosis and potential reversibility. She was transferred to the intensive care unit for 24 hours where she was treated with analgesics and magnesium sulfate and kept on strict clinical monitoring.

Fig 1. MRI image showing T2 high signal intensity in the cerebellar hemispheres (yellow arrows)



DISCUSSION

Complaint of headache after SA arouses the suspicion of post-dural puncture headache. It is due to dural and arachnoid puncture. The onset of post spinal headache puncture may be immediately. Therefore, the patient was managed for post spinal puncture headache PSPH.

The parturient maintained a normal blood pressure throughout her pregnancy and peripartum periods. Hence, hypertensive etiologies for headache were less likely to be suggested.

However, the occurrence of the visual disturbance preceded by a severe headache and followed, few minutes later by tonic-clonic seizure raised the possibility of PRES. In fact, PRES is a rare and serious entity of the central nervous system, characterized by headaches, seizures, altered mental status, and visual impairment [15]. Proteinuria may be absent [16].

PRES is frequently associated to hypertensive gestation (gestational hypertension, pre-eclampsia, eclampsia). However, PRES could rarely occur to a normotensive pregnant woman [17]. PRES may be caused by several conditions which include acute or chronic renal diseases, hemolytic uremic syndrome, use of cytotoxic and immunosuppressant drugs, blood transfusion, electrolyte disturbances, and regional anesthesia [18].

Findings of PRES on neuroimaging are common in women with neurological symptoms (headaches, vision disturbance, seizures). It reveals edema involving the white matter in the posterior portions of the cerebral hemispheres especially in the parieto-occipital regions [12]. The pathological condition in PRES relies mainly on two theories; The disruption of the cerebrovascular autoregulation caused by acute fluctuations of systemic blood pressure. In fact, the susceptible posterior areas of the cerebral hemispheres have a reduced density of sympathetic innervation in the posterior, compared to the anterior, circulation, the latter being more densely innervated by the superior cervical ganglion [21]. The second theory is that the syndrome is triggered by endothelial dysfunction caused by circulating endogenous or exogenous toxins [13].

Cerebral venous thrombosis may also share the same critical presentation as that of PRES. Hence, it must be excluded via imaging tools since it is the most frequent cerebrovascular disorder in the puerperium [19].

Administration of midazolam and magnesium sulfate intravenously treated the neurologic symptoms and prevented the recurrence of seizures. The visual deficits from PRES usually fully recover [20].

The prognosis of PRES is good. In general, the patient improves with symptomatic treatment, with no adverse effects [21]. With adequate treatment 70-90% of people with PRES make a full recovery within hours to days [22]. Of those who have residual symptoms after PRES, this attributable

largely to hemorrhage [23]. In our case the patient experienced complete recovery of her symptoms.

CONCLUSION

The relevance of this case report is due to the rare occurrence of posterior reversible encephalopathy syndrome to a normotensive parturient after spinal anesthesia for cesarean section. Although the pathophysiology is not well established, the prognosis is usually good.

Declaration by Authors

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