Subarachnoid hemorrhage caused by pregnancy induced hypertension: A rare occurrence

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INTRODUCTION

There is an increased risk of stroke in the post-partum period. Isolated convexal subarachnoid hemorrhage (cSAH) is an uncommon form of stroke in the post-partum period. The clinical presentation of cSAH is also variable.[1] Non-aneurysmal causes need to be particularly excluded in the case of isolated post-partum cSAH.

CASE REPORT

A 28-year-old primigravida presented with an episode of generalized tonic clonic seizure followed by slurred speech and numbness in the right forearm, hand and the right side of the tongue on the 2nd post-partum day. Patient had an uncomplicated vaginal delivery. However, she had a history of pregnancy induced hypertension (PIH), which was well-controlled with alpha methyldopa. There was no other significant past medical or surgical history. The patient did not complain of headaches any time after the delivery. On examination, the patient was conscious, well-oriented to time, place and person, but looked unwell and distressed. She was afebrile with a pulse rate of 90/min and blood pressure of 150/110 mm Hg. Neurological examination revealed reduced touch and pain sensation in the right forearm and hand. The motor examination was normal. Toes were down-sloping bilaterally. Cranial nerves examination and fundoscopy were unremarkable. Rest of the systemic examination was also normal. The magnetic resonance imaging (MRI) revealed the presence of mild SAH focally in the left superior frontal sulci [Figure 1a and b]. No evidence of blood was seen in the basal cisterns. The brain parenchyma was normal. MR venography of the brain did not reveal any evidence of cerebral venous thrombosis. The MR angiography of intracranial arteries did not show any aneurysm. The hemogram, renal and liver function tests were normal. Coagulation studies, including tests for protein C, protein S, antithrombin III and antiphospholipid antibodies, were negative. Cerebrospinal fluid analysis was unremarkable, except for the finding of 560 red blood cells/mm³. No proteinuria was found. Meanwhile, patient’s blood pressure was continuously monitored and kept at optimal level using oral amlodipine. The patient also received intravenous magnesium sulphate for 3 days. Digital subtraction angiography (DSA) for intracranial arteries performed 4 days later was normal. The patient showed complete clinical recovery at follow-up after 2 weeks.

Abstract

This article presents the case of a young primigravida with pregnancy induced hypertension (PIH) presenting with seizure in the post-partum period. Magnetic resonance imaging revealed the presence of isolated convexal subarachnoid hemorrhage (cSAH). The absence of any other demonstrable vascular anomaly or coagulopathy on further investigation suggested PIH as the cause of cSAH.

Key words: Convexal subarachnoid hemorrhage, magnetic resonance imaging, pregnancy induced hypertension, post-partum
DISCUSSION

Even during pregnancy and post-partum period, rupture of intracranial aneurysm is the commonest cause of SAH.\(^2\) The other common causes of non-traumatic SAH in the post-partum period are cerebral venous thrombosis (both dural and cortical), reversible cerebral vasoconstriction syndrome, arterio-venous malformation and posterior reversible encephalopathy syndrome (PRES).\(^3\) However, isolated cSAH is seldom caused by aneurysmal rupture.\(^4\) Hence, in case of isolated cSAH in the post-partum period, non-aneurysmal causes need to be looked for particularly.

Though extremely unusual, the only possible explanation for the isolated cSAH in our patient is PIH. cSAH caused by PIH has been reported previously by Shah in three patients.\(^3\) All three women presented with headache and seizure within 2 days of delivery. Interestingly, headache was conspicuous by its absence in our patient. The suggested hypothesis for SAH related to PIH is sudden increase in blood pressure and failure of cerebral autoregulation with propagation of the high arterial pressure waves to the relatively thin walled pial veins, resulting in their rupture.\(^2,3\) Two other important conditions need to be considered in the differential diagnosis of SAH induced by PIH. First one is eclampsia induced cerebral angiopathy, also known as PRES. PRES primarily is a disorder of cerebral autoregulation involving the posterior circulation. Classic MRI features of PRES include areas of hyperintensity in the posterior cortex on T2W images without any evidence of restricted diffusion.\(^2\) Associated SAH may be present. Catheter angiography shows vasospasm of the medium and large cerebral arteries, particularly of the basilar artery.\(^2\) The second differential diagnosis is post-partum cerebral angiopathy (PCA), the exact pathophysiology of which remains poorly understood. The diagnosis of PCA should be considered in normotensive women who present with intra-cerebral hemorrhage. PCA may also present as SAH. Catheter angiography shows multifocal stenosis and beaded appearance of the medium and small caliber cerebral arteries in anterior circulation.\(^2\) Many cases of post-partum SAH due to PCA and PRES have been described previously.\(^6-8\) However, to the best of our knowledge, the case series reported by Shah is the only one which has described PIH as the cause of SAH.\(^2,5\) A normal cerebral vasculature as documented by DSA excluded the possibility of any vasospastic angiopathy in our case.

Though the long-term prognosis of isolated cSAH depends upon underlying etiologic factor, the literature reports that the outcome is usually better in patients who are young and in whom no cause is found.\(^1,4\) The good clinical recovery seen in our patient is consistent with these observations.

CONCLUSION

Isolated cSAH should raise the suspicion of non-aneurysmal causes of SAH. cSAH is a rare form of stroke in post-partum period and PIH as a cause of cSAH is even rarer. Imaging modalities such as MRI and DSA are extremely useful in ruling out other more common causes of SAH in the post-partum period.

REFERENCES


