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FATAL PRIMARY INTRAVENTRICULAR HEMORRHAGE IN 3RD TRIMESTER OF PREGNANCY WITH RESCUE OF BABY

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ABSTRACT

Primary intraventricular hemorrhage (PIVH) in adults is rare. A number of risk factors have been associated with PIVH, the commonest being hypertension, arterio-venous malformations, aneurysms, and coagulopathies. Although pregnancy is not one of the risk factors for PIVH but there have been a few cases of PIVH in pregnancy. Among the cases of PIVH reported so far, the outcomes have been variable including survival of both mother and baby, survival of mother with death of baby, or death of both mother and baby. We report an unusual case of fatal PIVH in pregnancy in which mother suffered cardiopulmonary arrest in emergency room, and the baby was rescued through an emergency cesarean section, when mother had no signs of brain stem function.

INTRODUCTION

Primary intraventricular hemorrhage (PIVH) is a non-traumatic intracranial hemorrhage confined to the ventricular system, without any bleeding in the cerebral parenchyma. PIVH in adults is relatively rare, comprising 3.1% of all intracranial hemorrhages.^{1,2} A few cases of PIVH in pregnancy have been reported, although pregnancy is not one of the risk factors for PIVH. The true incidence for PIVH in pregnancy is not known but it is considered rare.

We report an unusual case of PIVH in a pregnant woman who had sudden cardiac arrest after arrival to emergency room, and baby was rescued through emergency cesarean section after unsuccessful resuscitative efforts in mother. A review of literature is also presented with observations on possible predictors of early mortality.

CASE REPORT

A 29-year-old woman, 30-week primigravida, presented

with sudden onset of headache and vomiting for 24 hours. Headache was severe, generalized and was initially relieved by analgesics to some extent but later the headache worsened. Her past medical history was unremarkable. Her pregnancy had been uneventful. On arrival she was unconscious with Glasgow coma scale of 4/15 with decerebrate posturing. Her blood pressure was 110/70 mm Hg. She was tachycardic and febrile, 103°F. Her pupils were equal and reactive. There were no other localizing signs. Systemic examination was unremarkable, and non-revealing for her clinical status. A CT scan of head without contrast showed panventricular hemorrhage with severe hydrocephalus. There was no parenchymal extension. Shortly afterwards, she went into cardiac arrest. Resuscitation was attempted and cardiac rhythm was restored in 10 minutes, but patient developed signs of brainstem death. The oxygenation was maintained with artificial mechanical ventilation. An urgent obstetrical ultrasound showed a viable fetus. A live baby was delivered by an emergency caesarean section. The family of patient refused autopsy to determine the cause of PIVH.

DISCUSSION

Primary intraventricular hemorrhage (PIVH) has been described to have three clinical presentations including sudden profound coma and death within 48 hours; sudden focal cerebral dysfunction; and sudden severe headache, drowsiness or confusion without focal neurologic signs.² Vertical gaze palsies, hyperthermia, miosis, unreactive pupils or decerebrate posturing have also been described with third ventricle hematomas, but only 1 out of 11 patients in the study by Angelopoulos et al., with blood in the third ventricle had elevated temperature.²

A variety of risk factors have been associated with PIVH, hypertension being the most common.^{1-2,3-5} Other etiologic factors include arteriovenous malformation (AVM), almost exclusively in patients under 50 years of age,³⁻⁵ aneurysms, coagulopathies, choroid plexus tumors and cysts, moyamoya disease and arteritis.¹⁻² For most patients (25-48%), however, the cause is unknown. In our case, the patient did not have any of the known risk factors. However, we were unable to get an autopsy or a cerebral angiogram to evaluate moyamoya disease, and other potential causes of PIVH, therefore, we consider our patient to have PIVH of undetermined etiology.

Hydrocephalus is a frequent complication.^{1-2,3-5} Passero et al. found hydrocephalus in all patients with stupor or coma (7 of 7); in 4 of 13 patients who were drowsy, and in 2 of 6 alert patients. Hydrocephalus has been reported as poor prognostic factor.^{2,4-5} This seems to hold true in our case where patient presented in coma and CT scan showed massive hydrocephalus.

Level of consciousness on admission is an important prognostic factor.^{2,3-5} In the study by Marti-Fabregas et al., all those who died had a decreased level of consciousness or were comatose on admission.⁴ Glasgow coma scale 8 and early hydrocephalus are predictors of in-hospital mortality.³ Diabetes mellitus and coagulopathy also predict early mortality.¹ In one series, hypertensive patients were found to have less extensive bleeding than non-hypertensive patients.³ Some investigators have used the extent of blood in the ventricles to determine the prognosis. The more severe the hemorrhage, the worse the prognosis.^{1,5-6} Death has been reported within 48 hours of panventricular hemorrhage.² Jayakumar et al. reported 70% mortality with panventricular blood and 100% recovery with blood in one ventricle.⁵ Hameed et al. also found panventricular blood to predict early mortality.¹ However, some studies have found no significant correlation between extent of blood and

outcome.^{2,4} Our patient had panventricular hemorrhage and died soon after the diagnosis was established. This is in concordance with published literature.

The neurological outcome of PIVH is not uniformly poor and has changed as diagnostic ability has improved, allowing the recognition of more benign cases. Death is thought to occur invariably from brainstem dysfunction.⁴ In-hospital mortality as high as 36-47% has been reported.^{2,3,5} Patients with PIVH of unknown cause have better prognosis than those with a documented mechanism of hemorrhage.^{1,6} The good prognosis is also attributable to the absence of parenchymal damage.⁴

Various treatment options have been tried in PIVH like direct or indirect cerebral revascularization surgery which can prevent both hemorrhagic and ischemic events in moyamoya disease patients.⁷ Other than external ventricular drainage or ventriculo-peritoneal shunt, recent work has focused on the use of intraventricular infusion of thrombolytic agents.² Findlay et al. treated 10 patients with IVH with tissue plasminogen activator and concluded that the treatment improved overall outcome by facilitating rapid lysis of the IVH and drainage with normalization of ventricular size and intracranial pressure.⁸

Cases have been reported where mother had cerebral parenchymal hemorrhage in pregnancy and baby was rescued by cesarean section and mother died subsequently within 2 weeks.^{9,10} Among cases where mother had PIVH, Mehrkens et al.,¹¹ and Newman et al.,¹² have reported cases in which mother survived and healthy babies were delivered. Nakai and co-workers reported a case in which the patient suffered primary IVH in the 14th week of pregnancy. She subsequently had a large infarct and died 16 days later. Her cerebral angiography confirmed moyamoya.¹³ Kim et al. reported a unique case in which patient had moyamoya disease and had intracranial hemorrhages in two consecutive pregnancies. The first was intraventricular hemorrhage in 27th week gestation, and second was intracerebral hemorrhage in 28th week of pregnancy. The baby delivered after the first pregnancy died but the baby delivered in the second pregnancy survived.¹⁴

To the best of our knowledge, no case has been reported so far in which mother had PIVH and died before baby was rescued. Our case is one of the rare situations in which fatal primary IVH occurred during pregnancy and the baby was rescued with an emergency cesarean section when no brainstem function was present in the mother.

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