

## Primary Intraventricular Hemorrhage in Second Trimester of Pregnancy: A Case Report

Vinay J\*, Harish S, Mangala Gouri and Akshith Raj Shetty

Department of Forensic Medicine, Adichunchanagiri Institute of Medical sciences, B G Nagar, Nagamangala Taluk, Mandya, Karnataka, India

\*Corresponding author: Vinay J, Assistant professor, Adichunchanagiri Institute of Medical sciences, B G Nagar, Nagamangala Taluk, Mandya, Karnataka, India, Tel: +919482884747; E-mail: [drvinayjgowda@gmail.com](mailto:drvinayjgowda@gmail.com)

Received date: October 29, 2016; Accepted date: November 21, 2016; Published date: November 28, 2016

Copyright: © 2016 Vinay J, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

In forensic practice intracranial hemorrhages are usually seen in cases of trauma but non traumatic, acute bilateral intraventricular hemorrhage that is in the young pregnant female is very rare and such cases come across by a forensic pathologist is still rarer. Here we present one such case of sudden natural death of fatal isolated pan intraventricular hemorrhage. The deceased was primigravida woman with 20 weeks of gestation, who was subjected to autopsy at the Department of Forensic Medicine, in our college with alleged history of domestic violence with her husband as complained by deceased's parents and brother; she was married one year back.

**Keywords** Primary intraventricular hemorrhage; Primigravida

### Introduction

Nontraumatic primary intraventricular hemorrhage (PIVH) is characterized by direct bleeding into the neuroventricular system without any bleeding in the cerebral parenchyma. PIVH in adults is relatively rare, it accounts for only 3.1% of all spontaneous intracerebral hemorrhages [1,2]. A number of risk factors have been associated with PIVH, however the hypertension is believed to be the major cause. The other causes include arterio-venous malformations, aneurysms, and coagulopathies. Reports about PIVH in the literature are infrequent and it appears to be a relatively benign condition.

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 [3].

### Case History

A 22 year old woman, 20 week primigravida as shown in the (Figures 1 and 2) had sudden onset of headache with repeated episodes of nausea and vomiting in the early morning hours. Initially she was taken to nearest hospital, there they have expressed their helplessness and was referred to higher center. On arrival she was unconscious with Glasgow coma scale of 4/15 with decerebrate posturing with mid dilated pupil and there was no cardiac activity of the baby. Shortly afterwards, she went into cardiac arrest and attempted resuscitation measures were failed. Later the body was brought for autopsy to the Department of Forensic Medicine of our College, with alleged history of domestic violence by her husband as complained by deceased's parents and brother, she was married one year back. On next day, during enquiry, her husband revealed nothing more information than those episodes of repeated vomiting and headache. Her past medical history was unremarkable and there was no significant medical history in the previous days and the night before. Later the body was subjected for autopsy.



Figure 1: A dead 22-year-old 20 week primigravida woman.



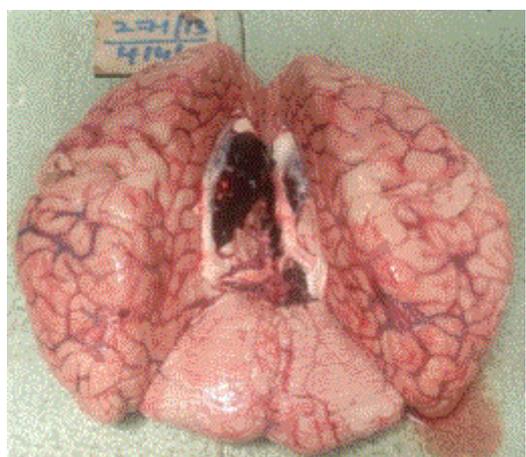
Figure 2: On opening abdominal wall and peritoneum, noted enlarged uterus.

On external examination, the body revealed nothing unusual. Further, on internal examination, lungs were edematous and congested; uterus was enlarged, contained 18-20 week's fetus (Figures 2

and 3). Brain was edematous, meninges and skull were intact. Further, cut section of brain revealed the pan ventricular hemorrhage (Figures 4 and 5) with extension into the 3rd ventricle (Figure 6) and to the pontine surface. The other organs were unremarkable. Brain was sent to histo-pathological examination after fixation in the 10% formalin. On histo-pathological examination, revealed there was a breach in the posterior cerebral artery. Finally its rupture was considered to be the cause for isolated pan ventricular bleeding, but the cause for such type of bleeding remained unknown.



**Figure 3:** On dissection of uterus and amniotic sac showing dead fetus.



**Figure 4:** Showing pan ventricular hemorrhage at autopsy table.

## Discussion

PIVH was first time described by sanders in 1881 as the flooding of the ventricle by blood without the presence of any rupture or laceration in the ventricular wall [4]. PIVH is defined as “a hematoma either confined completely within the ventricular system or arising within 15 mm of the ventricular wall” [5]. Spontaneous PIVH describes all nontraumatic cases of PIVH and includes hemorrhage related to entities such as vascular malformations, vascular tumours,

moyamoya disease, aneurysms, fibromuscular dysplasia, coagulopathy and hypertension, along with some idiopathic cases [6].

As mentioned earlier the incidence of PIVH among all the patients with intracranial hemorrhage is 3.1%, where this rises to 9% among the patients having intraparenchymal hematoma [4,7].

A variety of risk factors have been found associated with PIVH, among hypertension being the most common [1-3,7]. Other etiologic factors include arteriovenous malformation (AVM), almost exclusively in patients under 50 years of age, aneurysms, coagulopathies, choroid plexus tumours and cysts, moyamoya disease, arteritis [1,2] and in 25-48% of cases the cause is unknown [3]. In a study conducted by Hameed et al. reported that out of 15 cases, twelve (80%) had hypertension, coagulopathy in five (33%) and vascular malformations in two (13%) patients. Eleven (73%) patients developed hydrocephalus. Hydrocephalus is a common complication, associated with poor outcome [1].



**Figure 5:** Showing pan ventricular hemorrhage after fixation of brain.



**Figure 6:** Extension of pan ventricular hemorrhage into the 3rd ventricle.

However in our case, the deceased female did not had any of the known risk factors and also during her antenatal visits she appeared to be normal and case report had insignificant history.

Therefore, we consider that the deceased had PIVH of undetermined etiology.

To the best of our knowledge, the cases where mother had PIVH were reported by few authors like Tamizuddin et al. [3], Mehrkens et al. [8], Newman and Al-Memar [9], Jung et al. [10], except the first, in other 3 cases the cause was known to be moyamoya disease. However in the first case it is of unknown etiology.

In a retrospectively study conducted in the year 2004 to 2008 by Giray et al. reported that, among 24 patients, fourteen were male and rest 10 were female. The mean age for non-traumatic PIVH was  $60.6 \pm 17.4$  years (ranges 38-79) [11]. In the study conducted by Ahn and Hwang, during 2002 to 2008 reported that, the age ranged from 19-81 years (mean age 55.5 years), with the majority (79%) between the ages of 38 and 71 years and among 19 patients 11 were males and remaining 8 females (the male to female ratio was 0.72) [12] and in the another study by Hameed et al., between year 1988 to 2001 reported that 15 of 677 (2%) patients with ICH had PIVH [13]. 9 (60%) were men and median age was 56 years [1].

From the above studies it appears to be more common in males and on an average above 40 years of age. However in our case it was 22 year old young female with 20 weeks primigravida.

PIVH has been described to have three clinical presentations including sudden profound coma and death within 48 h, sudden focal cerebral dysfunction; and sudden severe headache, drowsiness or confusion without focal neurologic signs [2]

In a study by Hameed et al., reported that out of 15 cases of PIVH, nausea and vomiting was noted in 12 (80%) patients, headache in 11 (73%), drowsiness in 8 (53%), cranial nerve palsies in 7 (47%), signs of meningeal irritation in 5 (33%), hemiparesis in 5 (33%) and three(20%) patients were comatose and only one patient had seizures he had past history of stroke [1].

Among the 19 cases of PIVH patients treated, the most frequent complaint was headache (47%) followed by nausea and vomiting (38%) [12]. As reported by the authors, in our case the deceased had similar symptoms prior to the admission to hospital.

Level of consciousness on admission is an important prognostic factor [2,3,7]. Diabetes mellitus and coagulopathy also predict early mortality [1]. Some investigators have used the extent of blood in the ventricles to determine the prognosis. The more severe the hemorrhage, the worse the prognosis [1,7]. At the same time we have to remember that at autopsy it is the only criteria we can use to estimate the severity of condition. Hydrocephalus is a common complication, associated with poor outcome.

Jayakumar et al. reported 70% mortality with pan ventricular blood [1,3]. However patients with PIVH of unknown cause have better prognosis than those with a documented mechanism of hemorrhage (secondary intraventricular hemorrhage) [1,10] and also in the absence of parenchymal damage prognosis appears to be good [13]. Various treatment options have been tried in PIVH with minimal success like direct or indirect cerebral revascularization surgery, external ventricular drainage or ventriculo-peritoneal shunt and recently intraventricular infusion of thrombolytic agents. Although present technologies allow clinicians to reach the diagnosis in many PIVH patients, the condition's etiology remains unknown. However cause of death is thought to occur invariably from brainstem dysfunction [5].

Hence opinion to the cause of death was furnished as "Death is due to intraventricular hemorrhage consequent upon spontaneous rupture of posterior cerebral artery (Sudden natural death).

## Conclusion

The neurological outcome of PIVH is not uniformly poor and has changed as diagnostic ability has improved, allowing the recognition of more benign cases. Patients with PIVH of unknown cause have better prognosis. So as a physician or an obstetrician the possibility of such rare situation has to keep in mind when the patients present with severe headache, nausea, vomiting and focal neurological deficits. Early diagnosis and treatment would prevent such fatalities of both baby and mother or either of these two. As a forensic pathologist a careful autopsy and keeping the possibility of such rare situation especially in pregnant lady helps to take care at the time of dissection of the brain, which subsequently helps to determine the possible cause for rupture and prevents futile charges on consort.

## Acknowledgement

To the Department of Forensic Medicine and Pathology, M.S. Ramaiah Medical College, Bengaluru.

## References

1. Hameed B, Khealani BA, Mozzafar T, Wasay M (2005) Prognostic indicators in patients with primary intraventricular hemorrhage. *J Pak Med Assoc* 55: 315-317.
2. Angelopoulos M, Gupta SR, Azat Kia B (1995) Primary intraventricular hemorrhage in adults: clinical features, risk factors and outcome. *Surg Neurol* 44: 433-436.
3. Tamizuddin S, Hashmi M, Khatri IA (2010) Fatal primary intraventricular hemorrhage in 3rd trimester of pregnancy with rescue of baby. *Pak J Neurol Sci* 5: 18-20.
4. Sanders E (1881) A study of primary immediate or direct hemorrhage into the ventricles of the brain. *Am J Med Sci* 82: 85-128.
5. Martí-Fàbregas J, Piles S, Guardia E, Martí-Vilalta JL (1999) Spontaneous primary intraventricular hemorrhage: Clinical data, etiology and outcome. *J Neurol* 246: 287-291.
6. Patwardhan RV, Fowler M, Willis BK, Nanda A (2005) Idiopathic primary pan intraventricular hemorrhage in a child. *Neurol India* 53: 373-374.
7. Brott T, Thalinger K, Hertzberg V (1986) Hypertension as a risk factor for spontaneous intracerebral hemorrhage. *Stroke* 17: 1078-1083.
8. Mehrkens JH, Steiger HJ, Strauss A, Winkler PA (2006) Management of haemorrhagic type moyamoya disease with intraventricular hemorrhage during pregnancy. *Acta Neurochir (Wien)* 148: 685-689.
9. Newman P, Al-Memar A (1998) Intraventricular hemorrhage in pregnancy due to Moya-moya disease. *J Neurol Neurosurg Psychiatry* 64: 686
10. Jung YJ, Kim MA, Kwon JY, Lee HR, Cho HY, et al. (2015) Pregnancy outcomes in women with Moya-moya disease: Experiences at a single center in Korea. *Yonsei Med J* 56: 793-797.
11. Giray S, Sen O, Sarica F B, Tufan K (2009) Spontaneous primary intraventricular hemorrhage in adults: Clinical data, etiology and outcome. *Turkish Neurosurgery* 19: 338-344.
12. Ahn SW, Hwang SK (2010) Non-traumatic primary intraventricular hemorrhage. *Kor J Cerebrovascular Surgery* 12: 159-164.
13. Jayakumar PN, Taly AB, Bhavani UR, Arya BYT, Nagaraja D (1989) Prognosis in solitary intraventricular hemorrhage. Clinical and computed tomographic observations. *Acta Neurol Scand* 80: 1-5.