

Clinical and Radiological Profile of Post Partum Cerebral Venous Thrombosis

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How to cite this article: Vidya Sagar, Prabakaran. Clinical and radiological profile of post partum cerebral venous thrombosis. *International Journal of Contemporary Medicine Surgery and Radiology*. 2018;3(1):76-78.

A B S T R A C T

Introduction: Cerebral venous sinus thrombosis (CVT) has been recognized in the early part of the nineteenth century but still remains a diagnostic and therapeutic challenge for the clinician because of varying and misleading clinical presentation of this condition. Pregnancy and puerperium are most prevalent prothrombotic states leading to cerebral venous thrombosis (CVT). Current research aimed to study the clinical profile of patients presenting with cerebral venous thrombosis during the post partum period and to determine the radiological profile of patients presenting with cerebral venous thrombosis during the post partum period using CT scan.

Material and methods: Patients in the age group of 21-35 years admitted in the Medical and Obstetrics and Gynaecological units of tertiary care centre were included in the study. All these patients were examined for features of cerebral venous thrombosis and relevant investigations were done and radiologically confirmed as cerebral venous thrombosis. Data was collected regarding detailed history, examination and radiological findings of CT scan and analysed using appropriate statistical methods SPSS version 22.

Results: Majority of the patients were in the age group of 25-29 Years. Most of the cases (60%) presented in the 2nd week of the delivery. The commonest clinical presentation was headache and seizures. Other symptoms were loss of consciousness, hemiplegia, fever and vomiting. Small ventricles and ischaemic ventricles were the commonest findings in CT scan. Cortical vein thrombosis is the commonest site followed by sagittal sinus.

Conclusion: Computed Tomography study should be done immediately after the clinical manifestations so that both the contrast and noncontrast signs can be evaluated completely and hence allow rapid, early and relatively noninvasive diagnosis of this life-threatening condition and permits more rapid initiation of therapy.

Key words: Clinical and Radiological Profile, Post Partum Cerebral Venous Thrombosis

INTRODUCTION

Cerebral venous thrombosis is any thrombosis that occurs in intracranial veins and venous sinuses. Pregnancy induces several prothrombotic changes in the coagulation system that often persists at least during early puerperium. Hypercoagulability worsens after delivery due to volume depletion and trauma. The greatest risk period for the occurrence of CVT is in the third trimester and also in the first 4 postpartum weeks.¹

In Srinivasanetal study, puerperal CVT was 10-12 times more frequent in India and the various predisposing factors like anaemia, increased coagulability of blood, slowing of the blood stream and dehydration as aggravated by the local custom of withholding fluid intake specifically during puerperium contributed to the high incidence of CVT.²

Clinical findings in CVT are varied but fall into two major categories: Those related to increased intracranial pressure as a result of impaired venous drainage; and, those related to focal brain injury from venous ischemia/infarction or haemorrhage like headache which is the most prominent and commonest symptom, seizures, focal neurological deficit, cranial nerve palsy, altered sensorium, coma etc.

The diagnosis of CVT is mainly based on a high degree of clinical suspicion followed by imaging confirmation. The imaging findings of CVT can be categorized as direct, which means visualization of cortical or dural sinus thrombus; or, indirect, as when there are ischemic changes that are related to the venous outflow disturbance.

Cranial computed tomography (CT) is usually the first and foremost, and in developing countries, the only investigation performed in the emergency department. Direct signs of CVT as demonstrated by CT, are as follows: The cord sign, usually seen on head CT is the visualization of the hyperdense thrombosed cortical vein; the dense triangle sign, seen on noncontrast head CT, is the visualization of a fresh thrombus in the posterior part of the sagittal sinus; and, the most frequently seen direct sign is the "empty triangle" or delta sign, seen as non-filling of the confluence of sinuses after contrast injection.

More frequently, the contrast-enhanced CT scan reveals indirect signs like local or generalized brain swelling, contrast enhancement of the falx and tentorium, and localized hypodense or hyperdense areas reflecting hemorrhagic transformation.

In a suspicious case, the diagnosis is usually confirmed by

more sensitive imaging techniques such as an MRI and MRV.

Treatment options for cerebral venous sinus thrombosis include anticoagulation, thrombolytic therapy, and, in some cases, surgical thrombectomy.³

Cerebral venous thrombosis is known to be potentially life threatening condition if it is not diagnosed early and treated promptly, so in all women presenting with neurological symptoms during pregnancy or puerperium the possibility of CVT to be suspected and early CTscan to be done and managed accordingly to prevent further consequences.

So this study was undertaken to study the clinical profile of patients presenting with cerebral venous thrombosis during the post partum period and to determine the radiological profile of patients presenting with cerebral venous thrombosis during the post partum period using CT scan.

MATERIAL AND METHODS

A prospective study was carried out with consecutive 40 patients [antenatal and postnatal] aged between 21-35 years admitted in Obstetrics and gynaecology units of tertiary care centre who presented with features of CVT like headache, impaired consciousness, seizures, focal neurological deficit etc. After taking informed consent, a detailed history was taken, thorough general and systemic examination was done and patient was subjected to relevant investigations like Complete blood count, ESR, Renal function test, CSF analysis, blood fibrinogen.

CT scan as an emergency imaging modality was done in all patients and the radiological findings were studied.

Both plain and contrast CT was taken, for contrast 40-50 ml water soluble low osmolar contrast isohexol was given and patient was monitored for any adverse effects during scan time.

Neurologist opinion was taken for all the patients and treated appropriately with anticoagulants, anticonvulsants and followed up till they are discharged from hospital or till declared dead.

STATISTICAL ANALYSIS

All the data collected were analysed using descriptive statistics using SPSS 19.

RESULTS

The study included 40 patients with ages ranging from 21 to 35 years. There were 20 primi and 20 multipara. Majority of the patients were in the age group of 25-29 Years. Most of the cases (60%) presented in the 2nd Week of the delivery. Almost all the patients had normal delivery nearly 90%, except two cases of which one had undergone LSCS and another one had an abortion at 5 month. The commonest clinical presentation was Headache and seizures. Other symptoms were loss of consciousness, Hemiplegia, Fever and vomiting [table 1]. Twelve out of the forty cases were dehydrated. In relevant investigations cerebral spinal fluid showed raised protein values upto 80mg in 20% of the cases. The cerebral spinal fluid is occasionally Hemorrhagic. The Biochemical investigation showed raised fibrinogen level in

Clinical Manifestions	No.of cases	Percentage
Headache	22	55%
Seizures	24	60%
Unconsciousness	18	45%
Hemiplegia	2	5%
Fever	2	5%
Vomiting	1	2.5%

Table-1: Clinical manifestations –distribution

Computed Tomography findings	No.of cases	Percentage
Cord sign	3	7.5%
Hemorrhagic infarct	8	20%
Ischemic infarct	12	30%
Small Ventricles	16	40%
Intracerebral Hematoma	-	-
Brain edema	10	25%
Gyral Enhancement	1	2.5%
Tentorial enhancement	1	2.5%
Empty Delta sign	5	12.5%
Dilated Transcerebral -medullary Venis	-	-
Noramal Computed tomography	8	20%

Table-2: Distribution of computed tomography findings

Site	No.of cases	Percentage
Superior sagittal sinus	8	20%
Straight sinus	3	7.5%
Transverse sinus	2	5%
Cortical vein thrombosis	19	47.5%

Table-3: Site of Occlusion

plasma in nine out of the 40 cases. But almost all the cases showed high erythrocyte sedimentation rate (Nearly 84%). All cases were subjected to computed tomography study with a clinical diagnosis of cerebral venous thrombosis. In all cases contrast and noncontrast studies have been performed except in six cases where contrast was not given. There were no adverse reactions seen in anyone of the patient included in the study. Out of the 40 cases, 8 cases were normal in computed tomography (20%). Remaining 32 cases showed various computed tomography findings either in noncontrast or contrast enhanced scans. Small ventricles and ischaemic infarct were the commonest findings in CT scan [table 2]. Cortical vein thrombosis is the commonest site followed by sagittal sinus [table 3].

DISCUSSION

Pregnancy and puerperium are known to be accounting for 75% of cases of venous thrombosis and have survived with good recovery.⁴

Cerebral venous thrombosis is considered as one of the medical emergency with a highly variable mode of onset and wide spectrum of clinical manifestation, Early diagnosis of cerebral venous thrombosis is very essential as early treatment may prevent morbidity and also is life saving.

A CT scan is usually the first and most commonly requested imaging study in the emergency department and readily available that shows direct and indirect signs of Cerebral venous thrombosis.

The imaging modality of choice is magnetic resonance venography as it allows direct visualisation of the dural venous sinuses and the large cerebral veins.⁵ It is an invasive procedure with catheterisation of the jugular vein and therefore has associated risks.

In The present study, 40 patients were included with ages ranging 21 years to 35 years. Peak age incidence was in the age group 25-29 years and was comparable to other studies of umeshetal, rudreshetal and sasikala etal.⁶⁻⁸

Head ache was the commonest symptom followed by seizures and altered sensorium .similar to other studies like umeshetal and rudreshetal but in sasikalaetal study seizure was commonest presentation.⁶⁻⁸

The maximum occurrence 60% was seen in the first two weeks of puerperium. This is correlating with Srinivasan et al and Maru A et al series.^{2,9}

Out of the 32 cases 20 cases showed area of infarction of which eight showed Hemorrhagic component. The Hemorrhages were mainly subcortical in location. The infarcts were mainly white matter in location with irregular margins and there was extensive mass effects seen . The findings were similar to the study of umeshetal who also showed that radiologically the most common finding that was noted is hemorrhagic infarction (85.3%), followed by non-hemorrhagic infarction (15.7%)⁶. but nagarajaetal noted hemorrhagic infarct in 40.9% and nonhemorrhagic infarct in 51.6%. though not statistically significant.¹⁰

Small ventricle which is a non specific sign was noted in sixteen cases and mostly associates with other findings in our study. In sasikalaetal study combined sinus thrombosis was seen in majority of patients.⁸

Cortical vein was the commonest site of thrombosis in our study and this was similar to other studies.⁶⁻⁸

In our study there was no mortality similar to umeshetal⁶ but sasikalaetal showed 15.5% mortality.⁸

CONCLUSION

Cerebral venous sinus thrombosis is a potentially life threatening condition if it is not diagnosed early, but it is a treatable disorder.

The diagnosis should be considered in all women who present with neurological symptoms during pregnancy or the puerperium.

Accurate and prompt diagnosis of CVT is very crucial because timely and appropriate therapy can effectively reverse the disease process and significantly reduce the risk of acute complications and long-term sequel.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 13-01-2018; **Published online:** 20-02-2018