

Clinical Profile of Patients with Cerebral Venous Sinus Thrombosis in Malwa Region.

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Introduction

Cerebral venous sinus thrombosis (CVT) has been recognized since the early 18th century but still remains a diagnostic and therapeutic challenge. Cerebral venous sinus thrombosis is rare as compared to arterial stroke which often occurs in young individuals². CVT may occur at any time from infancy to old age, most of the reported cases involved women in association with puerperium³. Venous infarctions are often multifocal, bilateral, affecting both grey matter and sub cortical white matter. Patient of CVT usually presents with headache, seizure, papilledema, altered sensorium and focal deficits due to thrombosis of intracranial veins and sinuses resulting in hemorrhagic infarctions and raised intracranial tension². The above features are present in various combinations ranging from syndrome of raised intracranial pressure without localization to deep altered sensorium and dense hemiparesis. CVT forms a distinct subgroup of cerebrovascular disease in India and is a leading cause of mortality in women of reproductive age group³. In India, most of the cases are seen in postpartum period in women, while alcoholism is a significant risk factor in males.

Review of CVT cases from Asian countries is suggestive of differences in risk factors profile and outcome in these patients as compared to European studies.

Largest cohort of CVT patients from Europe (n=624) reported that 50% of these cases were related to OCP pills, 6% were due to pregnancy and 14% were secondary to puerperium. A study of 182 adult patients with CVT from USA reported 7% due to pregnancy and puerperium and 5% related to OCP use⁴. A study from Pakistan (N=109) patients with CVT reported that 17% were due to pregnancy and puerperium and 5% related to OCP use. Cantu from Mexico reported 59% cases due to Pregnancy and puerperium.^{5,6,7}

This study was undertaken to see the clinico etiological spectrum of patients with cerebral venous sinus thrombosis further to attempt correlation between site of venous occlusion and clinical parameters. The ability to accurately detect less clinically severe cases of CVT has modified the Natural history of this disorder. Thus, in contemporary series, the reported mortality rate ranges between 8% and 14%, Ferro JM in contrast to prior studies within which cause-specific mortality was as high as 30% to 50%. Although some patients with CVT present with catastrophic complications, such as stroke syndrome with focal neurologic signs or coma, many present with mild or nonspecific syndrome such as isolated intracranial hypertension, presenting with headache and papilledema.^{2,4} However, conversely to arterial stroke,

scarce information exists on natural history and long-term prognosis of CVT.

Aims and Objectives

1. To study clinical profile of patients with cerebral venous thrombosis of SAIMS Hospital.
2. To identify the etiological spectrum of patients with cerebral venous sinus thrombosis.
3. To attempt correlation between site of venous occlusion and clinical parameters.
4. To study outcome of patients with venous sinus thrombosis.

Review of Literature

Cerebral venous thrombosis or sino-venous thrombosis, as the name implies is a condition which involves cerebral venous sinuses and veins together or independent of each other with thrombotic event of varied temporal evolution. The clinical presentation is varied ranging from syndrome of raised ICT without localization to seizures, focal deficits and deep altered sensorium^{2,3}. Some patients may even present as behavioral disturbances as the predominant clinical manifestation, confusing the picture with postpartum psychosis. Strokes resulting from cerebral venous thrombosis usually affects young person's particularly women in reproductive age group, and carry a high mortality if not managed adequately⁸. The term primary idiopathic cerebral venous thrombosis is used when no specific etiological factor is evident. 'Secondary' sino-venous thrombosis results from a variety of causes that include injury, infection, hematological disturbances, dehydration etc⁹.

Historical Background- The wide spectrum of clinical features in Cerebral venous thrombosis, the varied and changing etiological factors and the apparent rarity of the condition had made advances in knowledge slow and uneven. Periods of relative neglect has been interspersed

with burst of enthusiastic discussion. The reference to cerebral venous sinus thrombosis was that of Ribes in 1724.¹

Epidemiology- In western countries, the incidence of CVT related to pregnancy and puerperium ranges from 1 in 1666-11000 pregnancies.

Risk factors like hyperhomocysteinemia, OCP use, alcoholism, procoagulant state are increasingly recognized in addition to the conventional risk factors like postpartum state.

Superior sagittal sinus-SSS lies in the attached border of the falx cerebri and runs from the foramen caecum to the occipital protuberance, where it joins straight sinus, lateral sinus and torcular herophili i.e. confluence of sinuses, The anterior part is narrow or sometimes absent or replaced by two superior cerebral veins that join behind the coronal suture, consequently anterior part of sinus is often poorly visualized on angiography and its isolated lack of filling is not sufficient to indicate thrombosis.

Lateral Sinus-The lateral sinus extends from the torcular herophili to the jugular bulb and consist of the transverse and sigmoid portions. They drain blood from cerebellum, brainstem and posterior portion of cerebral hemispheres.

Cavernous Sinus-This sinus drains venous blood from the orbits through the ophthalmic veins and from anterior part of base of brain via the sphenopalatine sinus and middle cerebral veins.

Cerebral veins-They can be roughly divided into 3 groups: Superficial cerebral veins, deep cerebral veins, veins of posterior fossa.

Clinical Profile-The spectrum of symptoms and signs among patients with CVT is remarkably variable. Patients present with varying combination of headache, seizures, aphasia, behavioral abnormality, altered sensorium and deficits.

Investigations-Venous thrombi can be detected with direct visualization or MR and CT parenchymal images or with various venographic techniques. The most commonly used venographic techniques currently include unenhanced TOF MR venography, contrast-enhanced MR venography, and CT venography.

Outcome-Before the advent of CT scan and angiography, CVT was diagnosed mainly at autopsy, and so prognosis was considered almost fatal. After the introduction of angiography and before the introduction of CT, the mortality rate varied from 20% to 50%. With the availability of CT and MR imaging as routine investigative tools, milder cases are increasingly recognized making the outlook more favorable. Overall, mortality varies from 15% to 20%.

Material and Methods

This study was performed as a hospital based observational study at a tertiary care centre, Indore, India, incorporating 50 patients hospitalized in between the period (2012 to 2015) with the final diagnosis of cerebral venous thrombosis (confirmed by imaging MRI/MRV or Angiography).

Inclusion Criteria- Patients of either sex with age>16 years presented to civil hospital, Indore, Patients with final diagnosis of cerebral venous thrombosis (confirmed by imaging MRI/MRV or angiography), Patient or legally acceptable representative ready to be incorporated in study and provides consent for the same.

Exclusion criteria-Patients who were initially diagnosed as CVT but MRV /angiogram were normal, Patients with recent history of neurosurgery, Patients not willing for admission or further investigations.

Methods-Patients were selected from the emergency room or medical wards of tertiary health care centre. The patients with final diagnosis of cerebral venous

thrombosis (proven by MR venography) in wards were assessed. All patients were investigated fully and as deemed necessary by clinical condition to find out the predisposing factors for venous thrombosis. Though routine investigations were sent for all patients, no investigation was sent solely for study purpose unless clinically indicated. Complete blood count, renal function including electrolytes, Chest X ray were obtained for all patients. Fundus examination was performed in all patients.

Results

Out of total 50 patients with confirmed venous thrombosis, 23 were female (46%) and 27 were male (54%). Male to female ratio was 1.17:1. So, incidence of venous thrombosis was slightly more in males.

Comparison of Male: Female ratio of other studies

Study	Country	Male : Female ratio
Pai et al 2013 (n=612)	India	1.5:1
Narayan et al 2012 (n=428)	India	1.17:1
Wassay et al 2008 (n=182)	USA	0.66:1
Ferro et al 2004 (n=624)	USA	0.33:1
Parikh et al 1987 (n=110)	India	2:1
Present study	India	1.17:1

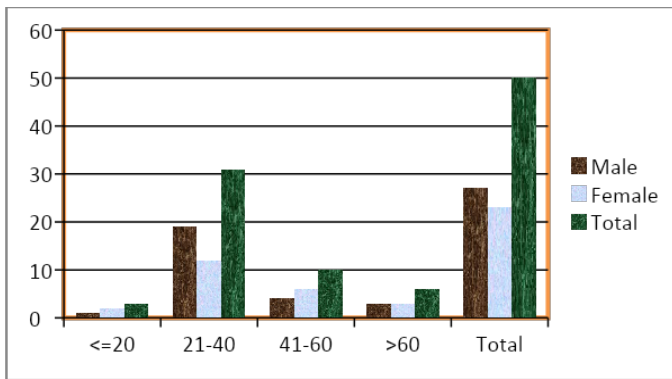
In the present study, CVST was found more frequently in men. Previous studies found 60-79% of CVST patients to be women ^(10,11,12) and reported it as the commonest cause of stroke in young women in India.¹³

The main reason for this was believed to be high prevalence of postpartum hypercoagulable state, precipitated by dehydration and consumption of high fat

food in the developing countries during peripartum period¹².

Distribution of Age and Sex

Age	Male	Female	Total
<=20	1	2	3
21-40	19	12	31
41-60	4	6	10
>60	3	3	6
Total	27	23	50
Mean age	35.7	36.16	35.7



Distribution of age and sex:

Out of total 50 patients, 27 were male, and 23 were females

Mean age among male is 35.7

Mean age among female is 36.16

Mean age among total study population is 35.7

A total of 31 patients (62%) are within age group 21-40, reflecting highest incidence among this group of patients.

6 patients are of age above 60 years.

Distribution of symptoms according to mode of onset:

Mode of onset	No. of patients
Acute	8
Subacute	35
Chronic	7

Majority of patients (43) had symptom duration of less than 30 days.

Out of that, 8 patients presented with symptom duration of <24 hours

35 patients had symptom duration between 1-30 days

Only 7 patients had symptoms duration >30 days

In majority of patients, symptom onset was SUBACUTE, with mean duration of 9.1 days.

In present study, 37 out of 50 patients had headache as a presenting complaint. History of seizures or observed seizures were presented in 20 (40%) patients, 12 patients had focal seizures, of which 8 patients had generalized tonic clonic seizures, Papilledema was present in 22 (44%) patients, 14 patients presented with altered level of consciousness, in present study, we found hemiparesis in 15 patients (30%), aphasia in 4 patients (8%), cranial nerve involvement in 7 patients (14%), 27 patients (54%) had no focal signs

Discussion

Patients were followed up for the period of 1 month, outcome was good in majority of patients, most of them were functionally independent at 1 month in contrast to arterial stroke where more patients remain dependent and bed bound. However, morbidity parameters were not calculated, so amount of morbidity and functionality was not known precisely. Despite a good outcome, we did have an in house mortality rate of 5 patients (10%), Death was mainly caused by raised intracranial pressure leading to cerebral herniation in the acute phase, along with complications like septicemia. Long term data of patients are not available as patients were followed up for short period of time (1 month).

Summary

- In present study 50 patients diagnosed to have venous sinus thrombosis were taken.
- Out of them, 27 were male and 23 were female.

- Out of 50 patients, 54% were male and 46% were female.
- Male to female ratio was 1.17:1.
- Majority of patients were in age group of 21-40 years (62%), reflecting highest incidence among these group of patients.
- Mean age of total study population was 35.7 years.
- Majority of patients (43) had symptom duration of less than 30 days.
- In majority of patients (35), symptom onset was SUBACUTE, with mean duration of 9.1 days.
- Though most of the patients have good outcome in terms of symptoms and functionality, we did have an in house mortality of 10% of total patients.

Conclusion

CVST is an important and treatable cause of stroke affecting both the genders almost equally. The present study revealed significant number of patients affected by CVST in 3rd and 4th decade of life, affecting male slightly more. Most common sinus affected was superior sagittal sinus followed by transverse sinus. Hyperhomocysteinemia, infection, dehydration, post are common precipitating factor for development of CVST in developing countries, including India. Peripartum period is vulnerable for development of CVST due to the present of infection and dehydration. Meticulous intensive care management is mandatory for better outcome in patients with CVST. Methylcobalamin, folic acid, and pyridoxine supplements to the patients with hyperhomocysteinemia will be helpful in the prevention of CVST.

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