

A Clinical Study of Cerebral venous Thrombosis. Findings from a Tertiary Care Hospital.

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Abstract: Introduction: Cerebral venous thrombosis is one of the important causes of stroke in young and in postpartum states. It will remain a diagnostic and therapeutic challenge for the physician/neurologist, given the varying and often misleading clinical presentations.

Objective: The objective of the study was to evaluate sample of cerebral venous thrombosis patients, their clinical presentations and relevant investigations.

Methods: Eighty (80) patients admitted to the Medical Emergency Ward, clinically suspected of CVT, were subjected to neuroimaging techniques, fulfilling the study criteria were recruited by simple random sampling.

Results: The number of patients were 80, with maximum incidence of 70% in age group 21-40 years. Females predominate with M:F = 1:19 in the peripartum period. Most common symptoms were headache 87.5%, seizures 67.5%, altered sensorium 55% and mode of presentation was subacute in 70% cases. Radiologically most common sinus involved was superior sagittal sinus 60%. Prognosis was favourable both in puerperal and non-puerperal group.

Conclusion: Diagnosis of CVT requires high index of suspicion. Important clinical signs to suggest this disorder are presentation with seizures, recent headache, vomiting and papilloedema in appropriate clinical settings. Neuroimaging plays a pivotal role in diagnosis. Management with heparin and oral anticoagulants is safe and effective.

Keywords: Cerebral venous thrombosis; Peripartum period; Neuroimaging; Clinical presentations

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I. Introduction

Cerebral Venous Sinus Thrombosis (CVT) has been recognized since the early part of the nineteenth century but still remains a diagnostic and therapeutic challenge for the clinician, given the varying and often misleading clinical presentation of this condition. It forms a distinct subgroup of cerebrovascular disease and is one of the commonest causes of stroke in India. Cross et al.^[1] noted "usually recovery is rapid and complete, if the patient survives acute episode". Three-fourth of cases of cerebral thrombosis in pregnancy and puerperium reported by him, survived with good recovery.

Although it may present with a variety of signs and symptoms, headache is the most frequent and often the earliest manifestation.^[2] The diagnosis of cerebral venous sinus thrombosis requires high index of suspicion. CT brain may show direct or indirect signs of cerebral venous thrombosis. It may be normal in 10% of patients. In such cases advanced neurological diagnostic like Magnetic Resonance Imaging with venography is necessary to confirm cerebral venous thrombosis, but it is not always readily available in many hospitals.^[3] It has been found that early diagnosis of cerebral venous thrombosis is essential because early treatment may prevent morbidity and may even be lifesaving.

Cerebral sinus venous thrombosis is considered to be a medical emergency,^[4] mode of onset highly variable, and spectrum of its clinical manifestations is extremely wide. The purpose of the present study is to evaluate sample of cerebral venous sinus thrombosis patients, their clinical presentations and relevant investigations.

II. Material & Methods

Patients with cerebral venous sinus thrombosis admitted to Sri Venkateswara Ramnarain Ruia Government General Hospital, Tirupati over a period from May 2018 to October 2019 are taken up for the study.

A total of eighty patients admitted in hospital during study period who had clinical and CT features (direct and indirect signs) suggestive of cerebral sinus venous thrombosis were selected.

Inclusion Criteria

1. Patients presenting with history suggestive of cerebral venous thrombosis and confirmed by imaging of brain (CT scan direct and indirect signs).

A. Direct Signs

- a. Hyperdense sinus on plain CT
- b. Cord sign on plain CT
- c. Empty delta sign on contrast enhanced CT
- d. Dense triangle sign on plain CT

B. Indirect Signs

- a. Cerebral edema
- b. Cerebral infarction not conforming to an arterial territory
- c. Small ventricles
- d. Bilateral signs
- e. Gyral enhancement
- f. Tentorial enhancement

Exclusion Criteria

1. CT scan inconclusive of CVT
2. Hypertensive hemorrhage
3. Arterial stroke
4. Metabolic encephalopathies
5. Space occupying lesions

Data was collected by using pre-tested proforma meeting the objectives of the study. Purpose of the study was carefully explained to the patients and informed consent was taken.

All patients were interviewed. Detailed history was taken with respect to epidemiological, clinical features, radiological features, with special emphasis on suspected precipitating or predisposing factors such as puerperium, fever, sepsis, anemia, abortions and oral contraception.

Detailed examination of patients was carried out including general physical examination for any evidence of anemia, dehydration, sepsis, deep vein thrombosis of leg and detailed neurological assessment with other systems were done to look for any evidence of etiologies.

Investigations: Hb%, TC, ESR, Peripheral smear, RBS, Serum urea, Serum creatinine, Urine routine, ECG in all leads, Ocular fundus, Chest X-ray, CSF analysis, CT scan, Wherever possible MRV, ANA, APLA, antithrombin III.

Statistical analysis: Data entry and analysis was done using Microsoft excel 2010 version. The results were analyzed by calculating percentages, the mean values, standard deviation, Chi-square 't' test. Proportions were compared using Chi-square test of significance. A 'p' value of less than 0.05 was considered statistically significant.

III. Results

Socio-demographic profile: A total of 80 cases of cerebral venous thrombosis were evaluated in the present study. The mean age of the patients in the present study was 24.2 ± 5.6 years. Majority of them were in the age group 21-40 years contributing to 70%. The youngest age being 17 and oldest 56 years. Majority of them were females (95%) with male:female being 1:19. Majority of patients were illiterates, 52 patients contributing to 65% followed by primary education in 20 patients attributing to 25%. Majority of patients (54 cases) belongs to low socioeconomic status contributing to 67.5% followed by middle class 22.5%.

Clinical profile:

With regards to type of CVT, out of 80, 72 (90%) patients belong to puerperal group and 8 (10%) belonged to non-puerperal group. Out of 8 non-puerperal, 4 were males and 4 female patients. Out of 72 puerperal patients, majority (54 patients) had home delivery contributing to 67.5%.

Duration from delivery on onset of symptoms among puerperal patients found that 67.5% (54 cases) of CVT occurred during 1-10 days after delivery.

In the present study, 56 cases (70%) of CVT had subacute presentation, followed by 24 cases (30%) with acute presentation.

With regards to levels of consciousness at the time of presentation, consciousness include 36 cases contributing 45% of the cases and drowsy of 26 cases with 32.5% incidence.

Most common symptom is headache contributing to 87.5% (70 cases) followed by convulsions in 67.5% (54 cases). Hemiplegia was present in 42.5%, dysphasia in 17.5% and papilloedema in 37.5% of patients.

In the present study, out of 80, 60 patients were anaemic, accounting for 75%, though the total number of deaths appears to be more with Hb% > 8 g%, the percentage of mortality was higher when there was moderate to severe anaemia. Though this was not significant statistically ($p > 0.05$).

Table 1: Haemoglobin percentage

Hb%	No of patients	Patients alive	Patients dead
< 5	2	2	0
5-8	12	10	2
8-10	46	42	4
> 10	20	18	2

CSF analysis was done in forty two patients (those suspected of having meningitis), of which 28 were normal and abnormality seen in rest 12 patients with pleocytosis being the maximum followed by protein rise. Xanthochromia was seen in 2 patients.

CT scan findings found that 70 cases of edema was seen with 87.5%, followed by haemorrhagic infarction comprising 44 cases with 55%. Non haemorrhagic infarction was seen in 45% of the cases. Empty delta sign in 42.5% cases.

In the present study, the most common sinus involved in CT scan (+ MRV) was superior sagittal sinus in 52 patients accounting to 65% followed by transverse sinus (25%) in 20 patients.

In this study of 80 patients, 72 were alive attributing to 90% and 8 died comprising 10%.

Table No2: CT Scan Findings

Signs	Number of cases	Percentage
Cord sign	30	37.5
Edema	70	87.5
Mass effect	22	27.5
Midline shift	22	27.5
Bilateral infarct	22	27.5
Empty Delta sign	34	42.5
Haemorrhagic infarction	44	55.0
Non-Haemorrhagic infarction	36	45.0

IV. Discussion

Comparing the age group involved, 20-40 years was the commonest age group involved in various series (Mehta SR et al.^[5] 77.8%).

The present study also showed similar findings with 70% in the same age group, with mean age of onset 24.2 years which is comparable with Nagaraj et al.^[6]. This can be attributed to peripartum being very common cause in our setup. Observations by various series have revealed. Mehta SR et al.^[5] M:F :1:1.4. In the present study, it is M:F:1:19.

Most of the patients were in low socio-economic group. This is because the hospital where the study was carried out caters to the lower socio-economic strata of society. Prakash C et al.^[7] mention reasons for its frequent occurrence in socioeconomically backward persons especially of Indian origin need to be researched.

The puerperal CVT group consisted of 72 women (90%) and the non-puerperal group consisted of 4 men and 4 women (10%). Nagaraj et al.^[6] had found that 200 out of 230 cases (86%) of CVT, seen over eight years, were puerperal in nature. The experience of other authors from India had been similar like Neki NS et al.^[8] had found 62% of cases of CVT in postpartum period. The present study is comparable with Nagaraj et al.^[6]

Kumar S et al.^[9] had found that 65 out of 85 cases (76%) of CVT, presented with symptom duration of four days or less. The present study showed 67.5% of patients presented within 10 days, which is comparable with Kumar S et al.^[9]

In the present study, 55% of patients had altered level of consciousness which is comparable with Nagaraj et al.^[6] and Neki S et al.^[8] who had 57.53% and 56% respectively.

Headache was the most common symptom in the present study accounting for 87.5% of patients. The present study was comparable with most other studies like Neki S et al.^[8] with 85.5%, Daif et al.^[10] with 82% and Mehta SR et al.^[5] with 77.8%.

In the present study, 52.5% of patients had focal deficits. Among them 42.5% had hemiparesis and 17.5% had dysphasia. Strolz E et al.^[11] (2005) had found that out of 79 cases, 36 (45.6%) cases and 17 (21.5%) cases had hemiparesis and dysphasia respectively. The present study was comparable with Strolz E et al.^[11] and Kumar S et al.^[9]

The most common finding in CT scan finding is haemorrhagic infarction present in 55% of cases. Similar observations noted with various studies like Nagaraj et al.^[6] with 40.9% and 48.4% respectively. Superior sagittal sinus is most commonly involved accounting for 65% followed by transverse sinus with 25%, comparable with other studies like Strolz E et al.^[11] (72.2%).

Contrary to ischemic arterial stroke, CVT could be described as an “all or nothing” disease with good short and long term outcomes when the acute phase of illness has been survived. In the present study, the mortality is 10% which is comparable with various other studies. Similar observations noted with Strolz E et al.^[11], and Nagaraj et al.^[6] with 15%, 25.9% and 21.7% respectively.

V. Conclusions

The present study emphasizes that cerebral venous thrombosis is an important cause of stroke especially in the peripartum settings and stroke in young. The spectrum of clinical presentation is extremely wide. Important clinical signs to suggest this disorder are presentation with seizures, recent headache, vomiting and papilloedema in the appropriate clinical settings. The diagnostic test of choice is MRI with MR venography. Management with intravenous heparin followed by oral anticoagulants is appropriate and the prognosis is generally favourable.

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