**Original article:**

**Study of clinical profile in patients of cerebral venous sinus thrombosis**

**Dr. Chennapareddy Venkata KotiReddy , Dr. Vikram B Vikhe , Dr. Prakash Shende , Dr. Mekapothu Sai Kishore**

Department of General Medicine , Dr. D Y Patil Medical College, Hospital & Research Centre, Pimpri, Pune - 411018

Corresponding authors: Dr. Prakash Shende & Dr. Mekapothu Sai Kishore

**Abstract:**

**Introduction:** Cerebral venous sinus thrombosis (CVST**/**CVT) refers to cerebral veins or Dural venous sinuses thrombosis. CVST is disease of young to middle-aged people and is more common in Females.It is a potentially life threatening condition requiring early clinical suspicion and prompt treatment.

**Material and methodology:** All patients of age more than 18 years admitted to the hospital with signs and symptoms such as Headache, Seizures, Focal deficits, Sub acute diffuse encephalopathy, painful ophthalmolegia etc. which are suggestive of Cerebral venous sinus thrombosis & confirmed by radio imaging.

**Results:** The most common presenting symptom was headache 28 (93.3%) followed by altered sensorium 13 (43.3%), seizure 13 (43.3%), motor deficit 7(23.3%), fever 3 (10.0%), vomiting 3 (10.0%) and diplopia 2 (6.7%). The most common presenting clinical sign was Papillodema 14 (46.7%) followed by Hemiparesis 11 (36.7%), Cranial Nerve involvement 9 (30.0%), Pallor 8 (26.7%) and Dysphasia 4 (13.3%)

**Conclusion:** Cerebral venous thrombosis, due to its wide spectrum of clinical presentation might be confused with other pathologies and hence the diagnosis may get easily missed or delayed. The clinical picture can vary from headache refractory to analgesics to coma. Since headache is the most common symptom, CVST should be suspected whenever a young adult presents with symptoms and signs of raised intracranial tension with or without other neurological symptoms.

**Introduction:**

Cerebral venous sinus thrombosis (CVST**/**CVT) refers to cerebral veins or Dural venous sinuses thrombosis. CVST is disease of young to middle-aged people and is more common in Females.1-3 It is a potentially life threatening condition requiring early clinical suspicion and prompt treatment.

Of all stroke cases, Cerebral venous sinus thrombosis constitutes 0.5 percent.1 Among, Pediatric and adult population the incidence of CVST varies. In adults the incidence per Million is 3-4 cases, whereas the incidence in Neonates, Children is more and found to be around 7 cases per million.4-6

Globally, rates of CVST seem to be variable. Repeated anecdotes and large case series from India, the Middle East, and Latin America suggest that incidence of CVST may be much higher in some parts of the world than those rates cited in the Australian and European literature, though population-based incidence data are lacking.7-10 The underlying reasons for these disparities may include a number of factors. Variably resourced environments and local and cultural differences around factors such as postpartum care may be partly responsible; genetics, or possibly even seasonal or local geographic or climate differences, such as altitude and humidity, may also play a role.11,12

**Material and methods:**   
This was a Prospective, Cross Sectional, Observational study. The present Study was conducted on radiologically confirmed cases of cerebral venous thrombosis admitted in Medicine Wards/MICU, Dr DY Patil Medical College Hospital and Research Centre, Pimpri,Pune .

**Inclusion criteria**

* All patients of age more than 18 years admitted to the hospital with signs and symptoms such as Headache, Seizures, Focal deficits, Sub acute diffuse encephalopathy, painful ophthalmolegia etc. which are suggestive of Cerebral venous sinus thrombosis & confirmed by radio imaging.

**Exclusion criteria**

* All patients of Age less than 18 years
* Patients with stroke due to arterial cause

**Methodology**

The study was conducted on 30 patients of cerebral venous thrombosis. The diagnosis of CVST was based on appropriate clinical findings supported by radiological evidence of CVST.

We obtained Informed consent from all of our patients. In all the 30 patients detailed history including demographic factors, type of symptoms , duration of symptoms & onset of symptoms : Acute (<48 hours), Subacute (48 hours to <30 days), and Chronic (>30 days), features suggestive of etiological factors, personal habits, comorbid illnesses, detailed menstrual and obstetric history in case of females was taken. All the patients were subjected to detailed clinical examination including general, neurological and other systems examination.

Assessment of Consciousness level, Glasgow coma scale score at the time of admission were also recorded in all patients. In GCS, the grading of severity is done as follows, Severe- GCS score of ≤ 8, Moderate- GCS score of 9-12 & Mild- GCS score of 13-15.

**Results:**

Our study was conducted in 30 patients of cerebral venous sinus thrombosis. We analyzed the demographic characters, onset and type of symptoms, etiology and clinical features of the disease in these patients. All of them were subjected to imaging modalities like CT brain and MRI brain with MRV and we analyzed the imaging characters of the disease in these 30 patients.

**Table 1: Age wise distribution of the study population**

|  |  |  |
| --- | --- | --- |
| **Age (In years)** | **Frequency** | **Percent** |
| 18-27 | 7 | 23.3 |
| 28-37 | 11 | 36.7 |
| 38-47 | 6 | 20.0 |
| 48-57 | 4 | 13.3 |
| >57 | 2 | 6.7 |
| Total | 30 | 100.0 |
| Range | 18-61 | |
| Mean±SD | 35.63±12.33 | |

Age range of our patients was 18 to 61 years. The mean age of the study population was 35.65 years. Of the 30 patients, 18 (60%) patients were in the age group of 18 to 37 years

**Table 2: Gender distribution of study population**

|  |  |  |
| --- | --- | --- |
| **Gender** | **Frequency** | **Percent** |
| Male | 13 | 43.3 |
| Female | 17 | 56.7 |
| Total | 30 | 100.0 |

In our study, 63.3 % of patients were females. Male female ratio was M:F=1:1.3

**Table 3: Gender wise distribution of mean age of study population**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gender** | **N** | **Mean Age** | **Std. Deviation** | **95% Confidence Interval of the difference** |
| Female | 17 | 33.3529 | 11.64550 | (-15.0977 to 1.9574) |
| Male | 13 | 39.9231 | 10.82021 |
| t-value | -1.578 | | | |
| p-value | 0.126 (NS) | | | |

Test applied: Independent sample t-test

Mean age of the male patients was 33.3529 years and female showed mean age of 39.9231 years. On analysis the difference was found statistically non-significant (p>0.05).

**Table 4: Distribution of onset of symptoms of study population**

|  |  |  |
| --- | --- | --- |
| **Onset** | **Frequency** | **Percent** |
| Acute | 11 | 36.7 |
| Sub acute | 16 | 53.3 |
| Chronic | 3 | 10.0 |
| Total | 30 | 100.0 |

About 53.3% of patients had Subacute onset of symptoms followed by 36.7% showed Acute onset and rest 10.0% showed Chronic onset of symptoms.

**Table 5: Distribution of clinical symptoms in the study population**

|  |  |  |
| --- | --- | --- |
| **Clinical symptoms** | **Frequency** | **Percent** |
| Headache | 28 | 93.3 |
| Altered Sensorium | 13 | 43.3 |
| Seizure | 13 | 43.3 |
| Motor deficits (weakness of Limbs, Loosening/tightening of Limbs ) | 7 | 23.3 |
| Fever | 3 | 10.0 |
| Vomiting | 3 | 10.0 |
| Diplopia | 2 | 6.7 |

The most common presenting symptom was headache 28 (93.3%) followed by altered sensorium 13 (43.3%), seizure 13 (43.3%), motor deficit 7(23.3%), fever 3 (10.0%), vomiting 3 (10.0%) and diplopia 2 (6.7%).

**Table 6: Distribution of clinical signs at presentation**

|  |  |  |
| --- | --- | --- |
| **Clinical signs** | **Frequency** | **Percent** |
| Papilloedema | 14 | 46.7 |
| Hemiparesis | 11 | 36.7 |
| Cranial Nerve involvement | 9 | 30.0 |
| Pallor | 8 | 26.7 |
| Dysphasia | 4 | 13.3 |

The most common presenting clinical sign was Papillodema 14 (46.7%) followed by Hemiparesis 11 (36.7%), Cranial Nerve involvement 9 (30.0%), Pallor 8 (26.7%) and Dysphasia 4 (13.3%)

**Table 7: Distribution as per cranial nerve involvement**

|  |  |  |
| --- | --- | --- |
| **Cranial Nerve involvement** | **Frequency** | **Percent** |
| 3rd | 1 | 11.1 |
| 6th | 3 | 33.3 |
| 7th | 5 | 55.6 |
| Total | 9 | 100.0 |

The most commonly involved cranial nerve was 7th nerve 5 (55.6%) followed by 6th nerve 3 (33.3%) and 3rd nerve was found involved in only 1 (11.1%) of the patients

**Table 8: Distribution of presenting risk factors in the study population**

|  |  |  |
| --- | --- | --- |
| **Risk Factors** | **Frequency** | **Percent** |
| Preganacy & Peurperium | **7** | 23.3 |
| OC Pills | 5 | 16.7 |
| DM | 5 | 16.7 |
| HTN | 4 | 13.3 |
| CSOM | 2 | 6.7 |
| Sepsis | 2 | 6.7 |
| Dehydration | 2 | 6.7 |

The most common presenting risk factor was Preganacy & Peurperium 7 (23.3%), followed by consumption of OC Pills 5 (16.7%), diabetes mellitus 5 (16.7%) and hypertension 4 (13.3%), CSOM 2 (6.7%), sepsis 2 (6.7%) and dehydration 2 (6.7%)

**Discussion:**

The epidemiological factors, clinical presentation, etiological factors of CVST are highly variable. It is considered to be more common in South Asia and in the Middle East.13

In the present investigation age range of patients was 18 to 61 years. The mean age of the study population was 35.65 years. Of the 30 patients, 60% patients were in the age group of 18 to 37 years. In the largest clinical series, the International Study on Cerebral vein and dural sinus thrombosis (***ISCVT)*** the median age of patients with CVST was 37 years.3

***Bousser et al.*** had arbitrarily defined 3 main modes of disease onset depending on the time elapsed between the appearance of the first symptom and the time of presentation to the hospital by patient; Acute onset is defined as <48 hours, Subacute onset is defined as more than 48 hours but less than one month of duration and Chronic onset is defined as >1 month duration.61 The onset of symptoms was analysed as Acute (<48 hours), Subacute (>48hours to 30 days) or Chronic (>30 days) in our study. According to literature, in ≥50% of the patients, the onset is Subacute.14 In our study, 53.3% of patients had Subacute onset of symptoms followed by 36.7% showed Acute onset and rest 10.0% showed Chronic onset of symptoms and this was found in agreement with the the observations of ***Narayan D et al***.14

By literature, most common risk factor among women is use of Oral contraceptive pills.14 Various studies have demonstrated the increased risk of CVST in patients using oral contraceptives and thrombophilia, particularly in the presence of prothrombin gene mutation, factor V Leiden mutation and hyperhomocystenemia. Use of oral contraceptive pill has been an important risk factor for CVST in the west, with a reported incidence of 40 to 45%.65

In the present study the most common presenting feature in CT brain was Non-Hemorrhagic Venous Infarct (60.0%) and Hemorrhagic Venous Infarct was observed in (13.3%) of the patients. Empty delta signs were observed in (36.7%) and cerebral edema in (10.0%) of the patients.

CVST is a clinical entity that is strongly associated with acquired or genetic prothrombotic states. A thrombophilia profile check-up including antithrombin III, factor V Leiden, protein S & protein C levels, as well as prothrombin time (PT), aPTT, and platelet count and functionality should be routinely checked and assessed in these patients . If no apparent cause of CVST is found even after routine work up, then an exhaustive laboratory workup for investigating the integrity of the thrombus formation & the lysis mechanisms is of utmost importance in the evaluation of these patients with CVST. The investigative procedures like Total Leucocyte Count (TLC), Erythrocyte Sedimentation Rate (ESR), Liver Function tests (LFT), Blood sugar, Serum creatinine, Blood urea & Serum electrolytes did not contribute to the diagnosis of CVST and were found to be non-specific.

**Conclusion:**  
Cerebral venous thrombosis, due to its wide spectrum of clinical presentation might be confused with other pathologies and hence the diagnosis may get easily missed or delayed. The clinical picture can vary from headache refractory to analgesics to coma. Since headache is the most common symptom, CVST should be suspected whenever a young adult presents with symptoms and signs of raised intracranial tension with or without other neurological symptoms.

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Ethics Committee Approval obtained for this study? YES

Was informed consent obtained from the subjects involved in the study?  YES

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