



## CLINICAL PROFILE IN PATIENTS WITH CEREBRAL VENOUS SINUS THROMBOSIS IN TERTIARY CARE HOSPITAL: A CROSS SECTIONAL STUDY

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**ABSTRACT** CVST often creates challenges regarding diagnosis among physicians, due to the nonspecific symptoms and countless presentation and absence of uniform symptoms. This study aims to understand current knowledge about CVST including its pathogenesis, etiogenesis, clinical profile, diagnosis, and treatment. **Methods:** A descriptive cross-sectional study was conducted in the department of neurology at tertiary care hospital, Mumbai between January, 2021 and June 2022. This study was approved by institutional ethics committee. All patients who were more than 18 years with diagnosis of cerebral venous sinus thrombosis, admitted to critical care unit of neurology department were included in this study and those with bleeding disorder and prior anticoagulation therapy, already diagnosed with CVST were excluded. **Results:** CVST was 3 times more common in females than in males and the age group of 21 to 30 years was more common affected. Headache was the most common symptom seen and papilledema was the most common sign. In females puerperium was the main cause of CVST. Superior sagittal sinus and right transverse sinus were the most common sinuses involved as seen on Computed tomography(CT)venography/Magnetic resonance venography(MRV) and common finding was venous infarct. The mortality rate was 16%. Patients with Isolated intracranial hypertension syndrome(ICH) had good outcome. Variables like age  $\geq 35$  years, GCS score of  $< 8$  and coma at presentation were associated with poor prognosis. **Conclusion** CVST has a wide range of clinical presentation. The prognosis is good in CVST but early diagnosis with treatment and care is required in patients with poor prognostic factors.

**KEYWORDS :** central venous sinus thrombosis, Isolated intracranial hypertension, outcome

### INTRODUCTION

In cerebral venous sinus thrombosis (CVST), there is a total or partial obstruction of dural venous sinuses or the cortical veins that can give rise to clogging in the vessels leading to focal or generalized neurological deficits.<sup>1</sup> CVST is a uncommon cause of stroke, usually attacking young to middle-aged patients. It accounts for 0.5–1% of all causes of stroke.<sup>1,2</sup>

Risk factors for children include sickle cell anemia, chronic hemolytic anemia, Beta-thalassemia major, heart disease, iron deficiency, certain infections, dehydration and head injury, for adults include pregnancy and puerperium, antiphospholipid syndrome, protein C and S deficiency, antithrombin III deficiency, lupus anticoagulant, or factor V Leiden mutation, cancer, collagen vascular diseases like lupus, Wegener's granulomatosis, and Behcet syndrome, obesity, intracranial hypotension(ICH), inflammatory bowel disease like Crohn's disease or ulcerative colitis.<sup>3</sup>

Symptoms of CVST include headache, blurred vision, fainting or loss of consciousness, hemiplegia, seizures, coma.<sup>3</sup> The diagnosis is usually on clinical suspicion and imaging. Magnetic resonance imaging (MRI) is the best imaging modality when computed tomography scan (CT scan) of the brain is uncertain for CVST.<sup>4</sup> CT is most sensitive screening test. Treatment include antiseizures, anticoagulants, surgery, continued monitoring of brain activity, measuring visual acuity and rehabilitation.<sup>3</sup>

Complications include motor deficit, speech problems, decreased visual acuity in both eyes due to secondary ich, headache ,increased fluid pressure inside skull,death.<sup>3</sup>

CVST thus pose challenges regarding diagnosis due to the nonspecific symptoms and numerous presentations.<sup>5,6</sup> Owing to advances in the diagnostic sensitivity of imaging modalities and the overall improved quality of treatment, mortality linked to CVST has fallen to 5–15% recently. The outcome of CVST can be complete recovery to death.<sup>7,8</sup>

**Aim:** To study clinical profile and outcome in 50 patients with CVST

**Methods:** A descriptive cross-sectional study was conducted in the department of neurology at tertiary care hospital, Mumbai between January, 2021 and June2022. This study was approved by institutional ethics committee and written informed consent was taken All patients more than 18 years with diagnosis of CVST admitted to neurology

department were included in this study and those with bleeding disorder and prior anticoagulation therapy were excluded. All the patients received standard treatment with unfractionated intravenous heparin followed by oral warfarin treatment. Target APTT level was kept between 55 to 80. Treatment with warfarin was started alongside unfractionated heparin after 48 hours to maintain the target international normalized ratio (INR) between 2 to 3 and continued till the time of discharge. Once the target INR level was achieved unfractionated heparin treatment was stopped. Patients were monitored for deterioration of clinical symptoms. Data were recorded as clinical presentations, Glasgow coma scale (GCS) at admission, contrast veno CT scan or magnetic resonance imaging (MRI) findings, venous sinus involved, course including morbidity and mortality and modified Rankin Scale (mRS) at discharge. Statistical analysis was done using IBM SPSS Statistic version 25. Continuous variable was expressed as mean and standard deviation and categorical data as frequency and percentage and Chi square was test of significance for qualitative data

**RESULTS:** CVST was 3 times more common in females than in males and the age group of 21 to 30 years was more common affected. Majority of patients had subacute presentation. Headache was the most common symptom and papilledema was the most common sign. Other common presentations were altered sensorium, focal motor deficit, generalized seizures, delirium and diminution of vision. In females puerperium was the main cause of CVST. Superior sagittal sinus and right transverse sinus were the most common sinuses involved as seen on Computed tomography(CT)venography/Magnetic resonance venography(MRV). Most common finding in CT Brain was venous infarct seen in 58% patients. The mortality rate was 16%. Patients with isolated intracranial hypertension syndrome had good outcome. Variables like age  $\geq 35$  years, GCS score of  $< 8$  and coma at presentation were associated with poor prognosis.

**Table 1 Variables in patients**

Age (in years)	Frequency N	Percentages %
<21	4	8
21-30	29	58
31-40	10	20
41-50	5	10
>50	2	4
Gender		

Male	12	24
Female	38	76
Onset of symptoms	Frequency N	Percentages %
Acute	22	44
Subacute	28	56
Presenting symptoms		
Headache	35	70
Altered sensorium	18	36
Motor deficit	16	32
Seizure	15	30
Diminution of vision	10	20
Clinical features		
Papilledema	24	48
Motor deficit	16	32
Cranial nerve palsy	7	14
Coma	3	6
Etiology	Frequency N	Percentages %
Puerperium	24	48
Dehydration	3	6
SLE	1	2
APLA	1	2
Hyperhomocystenemia	2	4
Meningitis	2	4
DuralAVfistula	2	4
CT Brain	Frequency N	Percentages %
Venous infarct	32	64
Sinus involved		
Superior sagittal (SSS)	34	68
Transverse	21	42
SSS and Transverse	12	24
Sigmoid	9	18
Straight	3	6
Outcome	Frequency N	Percentages %
Mortality	8	16

**Table no2 Association with outcomes in patients**

	Poor outcome N(%)	Good outcome N(%)	pvalue
Coma	8(16)	0	<0. 01
No coma	8(16)	34(68)	
Motor deficit	11(22)	7(14)	<0. 01
No motor deficit	3(6)	29(58)	
Isolated intracranial hypertension syndrome	0	18(36)	<0. 01
Others	11(22)	21(42)	

**Discussion**

The age group of 21 to 30 years was commonly affected. The mean age in our study was 28.9 years, lesser than as reported by Narayan et al study.<sup>9</sup>

In our study, females were majority similar to that observed in most other studies like Paulo PC<sup>10</sup> and Nahid A et al<sup>11</sup> study while Narayan et al study<sup>9</sup> reported male predominance. In our study, majority of patients had subacute presentation, followed by acute presentation and just (4%) of patients had chronic presentation findings similar to Narayan et al study.<sup>9</sup> In our study headache was the most common symptom followed by altered sensorium (40%), focal neurological deficit and seizures findings similar to other studies like Narayan et al.<sup>9</sup> Nahid et al,<sup>11</sup> DeBruin S et al.<sup>12</sup> Most common clinical finding observed in our study was papilledema similar to other studies like Paulo PC study<sup>10</sup> and Nahid et al study.<sup>11</sup>

Diminution of vision was seen in 20% patients in our study while Ferro et al study reported visual impairment in 13% patients, with severe visual loss occurring in 1.4%. Coma was observed in 16% of our patients lesser than that reported in Nahid et al study.<sup>11</sup>

Kalitha J study concluded that ICH may be seen as a rare presentation of CVST.<sup>13</sup> In our study ich was seen in 20% patients when compared to 18.2% by Narayan et al study.<sup>9</sup>

Women who have recently delivered are seen to be at increased risk of developing CVST as seen in Silvis SM, study.<sup>14</sup>

Hyperhomocystenemia is found to be associated with an increased risk of CVST in Nagaraja D et al study.<sup>15</sup> In our study only 2 % of patients had hyperhomocystenemia.

Anemia and alcoholism were reported as major risk factors by Narayan et al study.<sup>9</sup> In our study anemia was seen in 20% of patients and 8% of patients were alcoholics.

The Superior sagittal sinus and the lateral sinuses were the most commonly affected as seen in, Khosya S. et al<sup>16</sup> and Nahid A et al studies.<sup>11</sup>

While studies like Paulo PC et al<sup>10</sup> study and Wysokinska EM et al study<sup>17</sup> reported higher incidence of transverse sinus involvement. Our study showed that patients with ich syndrome had good outcome with mRS <2 while age ≥35 years, coma at the time of admission and Glassgow coma score <8 were predictors of poor outcome with mRS scale score of >2.

**CONCLUSIONS**

CVST shows range of clinical symptoms. Mostly the prognosis is good, however care is required in patients who have poor prognostic factors and more research is needed.

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