

Clinical Profile and Radiological Features in Cerebral Sinus Venous ThrombosisDr. Ranjith Kumar Polusani^{1*}, Dr. K. Naresh²¹Assistant Professor, Department of General Medicine, Prathima Institute of Medical Sciences, Karimnagar, Nagunur, Telangana, India²Resident Department of General Medicine, Prathima Institute of Medical Sciences, Karimnagar, Nagunur, Telangana, India***Corresponding author**Dr. Ranjith Kumar
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Abstract: Cerebral sinus venous thrombosis is a very common condition and it is an important cause of stroke especially in the peripartum setting and is one of the common causes of stroke in young patients. The present study has been undertaken to describe the clinical profile, diagnosis, and prognosis of CSVT. Methods: This cross-sectional prospective observational study was conducted in the Department of General Medicine, Prathima Institute of Medical Sciences, Nagunoor, Karimnagar. Based on the diagnosis 50 patients were included in the study, meticulous history, clinical examination, laboratory investigations including complete blood count, ESR, RBS, serum urea, serum creatinine, LFT, serum electrolytes, Urine electrolytes, ECG, CSF analysis were done in addition to imagining of the brain. Results: Out of 50 patients 25(50%) belong to the puerperal group and 25 (50%) belong to a non-puerperal group. Out of 25 non-puerperal patients 5 were female and 20 were male patients. The 25 puerperal cases the CSVT was seen in 18 cases in the first 10 days post-parturition and 5 cases were between 11-20 days and 1 case each of 21 -30 days and > 30 days were seen. In the present study, 24 (48%) of CSVT had a sub-acute presentation followed by 18 cases (36%) with an acute presentation. The clinical signs were hemiparesis and papilledema in 20(40%) of cases and pallor in 16(32%) and dysphasia was in 9(18%) of cases. In the study out of 50 patients, 17 were anemic, accounting for 34% and the mortality was higher when the degree of anemia was severe. Anticoagulant therapy with subcutaneous LMWH in 33 cases and intravenous unfractionated heparin infusion in 17 cases and later changed to oral anticoagulants. 5 patients required decompressive craniotomy out of which 1 patient died. Additional treatment included antiepileptics in 33 patients and anti-edema measures in 38 patients. Conclusion: CSVT is not an uncommon condition. Clinical presentation is extremely varied and symptoms may evolve over hours to few weeks. Neuroimaging plays a pivotal role in diagnosis MRI with MRV is the current diagnostic modality of choice. Management with unfractionated heparin, LMWH, and oral anticoagulation is appropriate. Surgical decompression is helpful in the cases of continuing deterioration, in spite of maximum medical management.

Keywords: Cerebral sinus, peripartum, CSVT, hemiparesis.**INTRODUCTION**

Cerebral sinus venous thrombosis [CVST] is less common than most other types of stroke but can be more challenging to diagnose. Due to the widespread use of MRI and rising clinical awareness, CVST is recognized with increasing frequency. In addition, it is now known to have a more varied clinical spectrum than previously realized. The available data suggest that CVST is uncommon [1]. The annual incidence ranges from 0.22 to 1.57 per 100,000 [2-4] and is more common in women than men with a female to male ratio of 3:1 [5, 6]. The imbalance may due to the increased risk of CVST associated pregnancy and puerperium and with oral contraceptives [7]. In adults CVST affects patients who are younger on average than those with arterial types of stroke in the international

study on the cerebral vein and dural sinus thrombosis ISCVT the mean age of patients with CSVT was 39 years [5] and only 8 percent of the patients were older than 65 [8]. CSVT presents with a wide spectrum of symptoms and signs. The headache is the presenting symptom in 70-90% of cases [9-11]. Focal deficits such as hemiparesis and papilledema occur in one-third to three-quarters of cases CSVT most commonly involves superior sagittal sinus (72%) followed by lateral sinus (70%). In 30 – 40% of cases more than one sinus is involved [10]. The diagnosis of CVST required a high index of suspicion because of its varied presentations neuroimaging is the cornerstone in the diagnosis of cerebral sinus venous thrombosis, imaging modalities of choice is CSVT are CT scan and MRI with MR

venogram. CT scan may be normal in 15-30% cases but MRI with MRV is almost 100% diagnostic.

Current therapeutic options for CSVT treatment include anti-thrombotic therapy with unfractionated heparin, low molecular weight heparins (LMWH), oral anticoagulants, intravenous thrombolysis, local thrombolysis by selective sinus catheterization and a combination of thrombolysis and anticoagulation in addition to symptomatic therapy [12]. CSVT has an acute fatality of less than 5% and most patients recover without sequelae [8]. It has been found that early diagnosis of cerebral venous thrombosis is essential because early treatment may prevent morbidity and even be life-saving. Therefore, prospective cross-sectional study has been undertaken to describe the clinical profile, diagnosis, and prognosis of CSVT.

MATERIALS AND METHODS

This cross-sectional prospective observational study was conducted in the Department of General Medicine, Prathima Institute of Medical Sciences, Nagunoor, Karimnagar. Institutional Ethical Committee Permission was obtained for the study. A written consent was obtained from all the participants of the study after explaining the study in the local language. Inclusion criteria were patients with confirmed diagnosis of cerebral sinus venous thrombosis, patients

were all above 18 years ago. Exclusion criteria were : CT inconclusive of CVST, hypertensive hemorrhage, Atherothrombotic stroke, metabolic encephalopathies. The diagnostic criteria were the patients with history and examination suggestive of cerebral venous sinus thrombosis and confirmed by imaging of the brain (CT scan direct and indirect signs, MRI, MRV). Based on the diagnosis 50 patients were included in the study, meticulous history, clinical examination, laboratory investigations including complete blood count, ESR, RBS, serum urea, serum creatinine, LFT, serum electrolytes, Urine electrolytes, ECG, CSF analysis were done in addition to imaging of the brain. The data was entered in MS Excel and analyzed using chi-square test and a 'p' value of <0.05 was considered significant.

RESULTS

A total of 50 cases of both sexes were included in this study maximum patients belong to age group 18 – 30 years 32 (64%) followed by 11 (22%) of age group 31 – 40 year 4(8%) belonged to 41 – 50 years and > 50 years were 3(6%) respectively shown in table-1. The mean age of the patients in the present study was 30.67 ± 9.34 years and youngest patient was 18 years and eldest was 58 years old. Out of the 50 patients, 20(40%) were male and 30(60%) were female patients the male to female ratio was 2:3.

Table 1: Age and sex wise distribution of cases involved in the study

Age in years	Male	Female	Total (%)
18 – 30	12	20	32 (64)
31 – 40	4	7	11 (22)
41 – 50	2	2	4 (8)
> 50	2	1	3 (6)
Total	20	30	50 (100)

Table 2: Showing the mode of onset of CSVT

Mode of onset	No of patients	Percentage
Acute	18	36
Subacute	24	48
Chronic	8	16
Total	50	100

Out of 50 patients, 25(50%) belong to the puerperal group and 25 (50%) belong to the non- puerperal group. Out of 25 non- puerperal patients 5 were female and 20 were male patients. The 25 puerperal cases the CSVT was seen in 18 cases in the first 10 days post-parturition and 5 cases were between 11-20 days and 1 case each of 21 -30 days and > 30 days were seen.

The patients who presented within 48 hours were considered to have an acute onset, with onset longer than 48 hours but less than one month was considered sub-acute and those with the onset of greater than one 1 month were included as chronic cases. In the present study, 24 (48%) of CSVT had a sub-acute presentation followed by 18 cases (36%) with an acute presentation. In the study 26(52%) were conscious and 11 (22%) were drowsy at the time presentation. 8(16%) were stuporous and comatose 5 (10%).

Table-3: Showing the level of consciousness in patients at the time of presentation

Level of consciousness	No. patients	Percentage
Conscious	26	52
Drowsy	11	22
Stuporous	8	16
Comatose	5	10
Total	50	100

The most common symptom of the presentation was a headache in 84% of cases followed by convulsions in 66% of cases, Focal deficits were seen in 58% of patients altered sensorium was in 54% of cases and Diplopia was seen in 10% cases. The

clinical signs were hemiparesis and papilledema in 20(40%) of cases and pallor in 16(32%) and dysphasia was in 9(18%) of cases. In the study out of 50 patients, 17 were anemic, accounting for 34% and the mortality was higher when the degree of anemia was severe.

Table-4: Symptoms of patients at the time of presentation

Symptom	No of patients	Percentage
Headache	42	84
Convulsions	33	66
Focal Deficits	29	58
Altered sensorium	27	54
Vomiting	23	46
fever	15	30
Diplopia	5	10

The investigative procedures like leucocyte count, blood sugar, serum creatinine, blood urea, liver functions, and serum electrolytes did not contribute to the diagnosis and were non-specific. In the present study 28 (56%) had the hemorrhagic following by non-hemorrhagic infarction comprising 22(44%). 21 patients were subjected to CSF analysis where ever there was a suspicion of meningitis out of which 9 were normal and pleocytosis seen in 8 patients protein rise in 4 patients. In the study, the most common sinus involved was

superior sagittal sinus in 35 patients accounting to 70% followed by transverse sinus (36%) in 19 patients. Anticoagulant therapy with subcutaneous LMWH in 33 cases and intravenous unfractionated heparin infusion in 17 cases and later changed to oral anticoagulants. 5 patients required decompressive craniotomy out of which 1 patient died. Additional treatment included antiepileptics in 33 patients and anti-edema measures in 38 patients

Table-5: Clinical signs of patients at the time of presentation

Clinical signs	No of patients	Percentage
Hemiparesis	20	40
Papilledema	20	40
Pallor	16	32
Cranial nerve involvement	16	32
Dysphasia	9	18

Table-6: Clinical nerve involvement

Cranial Nerve Involvement	No of patients	percentage
3 rd	2	12.5
6 th	6	37.5
7 th	8	50
Total	16	100

Table-7: Sinus involved in the patients of the study

Sinus involvement	No of patients	Percentage
Superior sagittal sinus	35	70
Transverse sinus	19	36
Sigmoid sinus	12	24
Jugular sinus	9	18
Straight sinus	7	14
Internal cerebral vein	5	10

Table-8: Outcome at the discharge and at 3 months and 6months

Modified Ranking Scale	Discharge (n=50)		3 months (n=40)		6 months (n=28)	
	No of cases	%	No of cases	%	No of cases	%
0	16	32	15	37.5	12	42.85
1	14	28	13	32.5	10	35.72
2	8	16	8	20	4	14.28
3	4	8	3	7.50	2	7.15
4	2	4	1	2.5	0	0
5	1	2	0	0	0	0
Death	5	10	40	100	28	100

DISCUSSION

In this study, a total of 50 cases were involved and commonest age group involved in various studies [13, 14]. The present study also showed similar finding with 84% in the same age group with a mean age of onset 30.76 years which is comparable with Daif A *et al.*, [15] In the male to female ratio was 2:3 the present study is comparable to Mehta SR *et al.*, [13] In this study the puerperal CVT group consisted of 25 women (50%) and the non-puerperal group consisted of 25 patients out of which 5 were female and 20 were male. Nagaraj *et al.*, in his study have found that 200 of 230 cases of CVT seen over eight years were puerperal in nature [16]. The duration of the presentation of patients to the hospital in the present study was within 10 days which is comparable with the study by Kumar S *et al.*, [17]. Bousser *et al.*, has defined three main modes of onset based on the time lapse between the appearance of the first symptom and the date of entry in hospital acute as < 48 years sub-acute as longer than 48 hours but less than one month and chronic as > 1 month [18]. In the present study, we found 36% of patients with acute presentation 48% with subacute and 16% were chronic cases. Headache was the common symptom in the present study with 82% of patients reported this symptom. 66% had seizures comparable with Kumar S *et al.*, [17] these manifestations indicate the cerebral cortical involvement. Focal deficits were found in 58% of patients among them 20 had hemiparesis and 9 had dysphasia these findings were similar to findings of Nagaraj *et al.*, [12] who found 57.3% of patients with focal deficits. In the present study, CSF analysis showed non-specific changes like pleocytosis (>cells/mm³ in 8 patients) raised protein (>mg/dl in 4 patients) which did not contribute to the diagnosis of CVT. The most common finding in the present study was hemorrhagic infarction in 56% of cases. Similar observations were observed in other studies like Nagaraj *et al.*, [12] the treatment of CSVT in our study was done with anticoagulants. In past, the CSVT was associated with dismal prognosis and a high mortality rate up to 50%. The recent ISCVT study performed in the era of modern neuroimaging, LHW administration and endovascular intervention, reported much lower mortality rates 8-14% and a significantly better outcome. A meta-analysis of 19 studies conducted by Dertali *et al.*, [19] showed that the mortality rate during the perihospitalization period was about 5.6% while at

the end of the follow-up period, this percentage increased to 9.4%. In the present study, the mean hospital stay was 12.6 days with 70% having complete recovery at the time of discharge.

CONCLUSION

Within the limitations of the present study, it was found that CSVT is not an uncommon condition. Clinical presentation is extremely varied and symptoms may evolve over hours to few weeks. Clinical features to suspect this disorder are a recent headache, seizures, papilledema and focal deficits in the appropriate clinical settings. Neuroimaging plays a pivotal role in diagnosis MRI with MRV is the current diagnostic modality of choice. Management with unfractionated heparin, LMWH, and oral anticoagulation is appropriate. Surgical decompression is helpful in the cases of continuing deterioration, in spite of maximum medical management.

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