International Journal of Medical and Health Sciences

Journal Home Page: http://www.ijmhs.net ISSN:2277-4505

Original article

Characteristics of cerebral venous thrombosis in a South Indian Rural Hospital

Elanagan Nagarajan*[1], V.Shankar[2]

[1]St Matthews University School of Medicine,Grand Cayman ,Cayman Islands .
[2]Professor,Sri Ramachandra Medical University, Porur,Chennai,India.

ABSTRACT

Introduction: Purpose of this study was to evaluate the clinical profile of the patients with cerebral venous thrombosis and to assess the risk factors involved. **Methods:** This study was a retrospective study performed at Sri Ramachandra Medical Centre, Porur, Chennai and a total of 25 patients were reviewed. Clinical features, mode of onset, predisposing factors and CT/MRI findings were noted. All patients who were diagnosed to be having cerebral venous thrombosis were included in this study. **Results:** Mean age was 35.7 years (range, 15 to 70 years) with a male to female ratio of 13:12. Headache (84%) and convulsions (47%) were the most common clinical features. 44% of the patients had altered sensorium and 9.1% were comatose at the time of presentation. Focal neurological deficits were observed in 60% of the patients and hemiparesis was the common deficit, seen in 28% of the cases. Subacute presentation (52%) was the most common mode of onset followed by acute presentation (40%). Predisposing factors were identified in 72% of patients. Infection was identified as a risk factor in 28% cases. CT scans showed hemorrhagic infarcts in 32% of the patients. Superior sagittal sinus was the most frequent sinus involved, 68% had partial or complete occlusion of the superior sagittal sinus. There was no mortality in the present series.**Conclusion:**This study reports that cerebral venous thrombosis in developing countries particularly in rural area are no different from developed countries needs to follow similar prevention and management .

KEYWORDS: Cerebral venous thrombosis, Seizures, Sinus, Neurological deficits, Infection.

INTRODUCTION

Cerebral venous thrombosis (CVT) or Dural venous thrombosis is an uncommon condition, but its clinical presentation is varied and often dramatic[1].The prognosis of CVT is variable and outcome may range from complete recovery to death[2].Although recognized for more than 100 years [1] it hasbeen diagnosed frequently ante-mortally only in recent years.This is partly due to greater awareness among physicians andneurologists, partly to improved non-invasive imaging techniques.Family physiciansneed to develop a broad differential diagnosis when evaluatingpatients with acute headache symptoms. Appropriately obtainingneuroimaging in those with signs and symptoms of focal neurologicaldysfunction is of the utmost importance[3].The purpose of this study was to analyze the characteristics of cerebral venous thrombosis in a rural hospital. The objectives were to study the clinical profile of the patients with CVT and to assess the risk factors involved.

MATERIALS AND METHODS

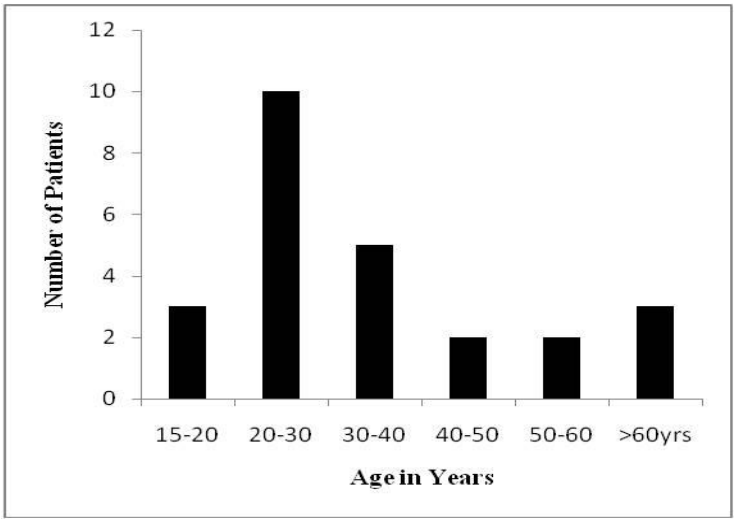
This study was a retrospective review performed at Sri Ramachandra Medical Centre, Porur, Chennai. This is a hospital situated in coastal rural area of south India. All acute neurological admissions between July 2008 and December 2008 were reviewed. A total of 25 patients who were diagnosed to have CVT were included in this study. Patient charts were reviewed and the clinical findings were identified, analyzed according to age, sex, mode of onset, predisposing factors and clinical features. The patients were treated by neurologists, general physicians and family physicians. Appropriate CT and MRI scans (plain/contrast) were done in all patients and MR venograms were also performed. A detailed neurological examination was done which included assessment of the level of sensorium, any evidence of raised intracranial tension, any focal neurological deficits and any evidence of meningeal irritation. CSF analysis was also done in some patients with meningeal signs.

RESULTS

Age and sex

Twenty five patients were admitted with CVT with a mean age of 35.7 years (range 15 - 70 years). Majority of the patients (40%) were in 2nd and 3rd decade of age (Fig. 1). There were 13 males and 12 females.

Figure 1: **Age distribution of patients with cerebral venous thrombosis**



Mode of onset

Most of the patients had subacute presentation (52%), followed by acute (40%) and chronic onsets (8%).

Clinical features

Headache was the most common presenting symptom, seen in 84% of the cases(Table 1). Seizure was the other common symptom and observed in 47% of the cases. The types of the seizures observed in the patients were generalized tonic-clonic (54.6%), focal (27.3%) and focal with secondary generalization (18.2%). Altered sensorium was observed at the time of presentation in 44% and the patients were comatose in 9.1% of the cases. Bilateral papilloedema was present in 72% of the patients. The 28% of patients presented with features of isolated intracranial tension. Focal neurological deficits were observed in 60% of the patients. Hemiparesis was the common, seen in 28% of the cases. Monoparesis (12%), paraplegia (4%) and multiple cranial nerve dysfunctions (12%) were also present.

Table 1: **Clinical features of patients presented with cerebral venous thrombosis**

S.NO	SYMPTOMS	Number of Patients	PERCENTAGE
1	Head Ache	21	84%
2	Seizures	11	47%
3	Alteration on loss of consciousness	11	47%
4	Sign : Focal Deficits i)Sensory ii)Motor	 15 1	 60% 4%
5	Hemiparesis/Hemiplegia	7	28%
6	Monoparesis/Monoplegia	3	12%
7	Paraplegia	1	4%
8	Multiple cranial Nerve Deficits.	3	12%
9	Bilateral Papileoedema	18	72%
10	Meningial Irritation	4	16%
11	Isolated ICT	7	28%

Predisposing factors

The Predisposing factors were identified in 72% of patients and are shown in (Table 2). Infection was identified as the risk factor in 28% cases. Among them mastoditis (20%), sinusitis (4%) and Tubercular Meningitis (4%) were identified. Among the non puerperal female, CVT was associated with oral contraceptive pill (OCP) usage in 4% of the cases. SLE was diagnosed in 4% of the cases. One of the SLE patients had post partum CVT and others had OCP usage as an additional risk. Hereditary thrombophilic condition was not extensively investigated due to financial and operational difficulties. Primary anti phospholipid antibody syndrome was identified as risk factor in 28% of patients. The patients had both Protein C and S deficiency in 4% of the cases.

Table 2: **Predisposing factors of cerebral venous thrombosis in patients**

FACTORS	Number of Patients	PERCENTAGE
Infection Etiology	7	28%
Mastoiditis	5	20%
Sinusitis	1	4%
TBM	1	4%
Non Infection Etiology	11	44%
APLA	7	28%
Protein S Deficiency	1	4%
Protein C Deficiency	1	4%
OCP Use	1	4%
SLE	1	4%
Un Identified	7	28%

CT scan findings

CT Brain was normal in 32% of the patients(Table 3). Hemorrhagic infarct (32%) was the most the common finding followed by nonhemorrhagic infarct (16%) and subarachnoid hemorrhage (12%). Direct sign of CVT was seen in 12% of patients followed by cord sign (4%) and empty sign (8%). Indirect signs (40%) were common than the direct signs and included cerebral edema, tentorial enhancement, obliteration of cisterns and squacing of ventricles.

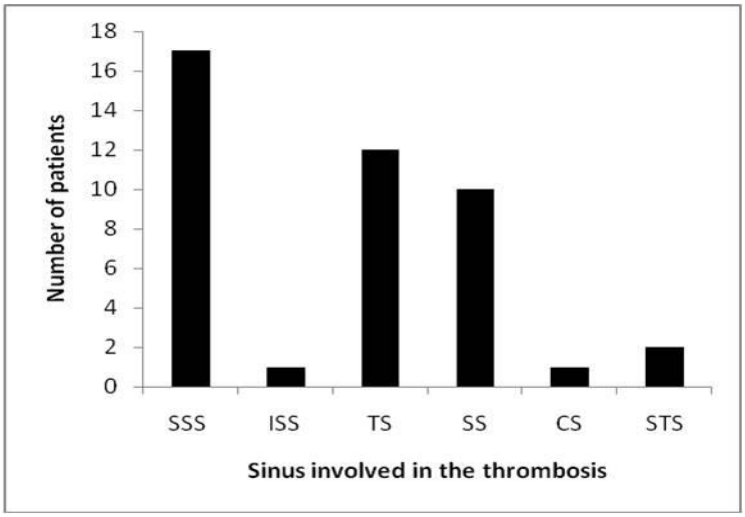
Table 3: CT scan findings in patients presented with cerebral venous thrombosis

	Number of Patients	PERCENTAGE
Normal	8	32%
Non-Hemorrhagic infract	4	16%
Hemorrhagic infract	8	32%
Sub Arachnoid Hemorrhage	2	8%
Direct Sign	3	12%
Cord Sign	1	4%
Empty Delta Sign	2	8%
Indirect Delta Sign	10	40%
Cerebral Edema	4	16%
Obliteration of Cistern	2	8%
Squashed	3	12%
Tentorial Enhancement	1	4%

MRI scan findings

Superior sagittal sinus was the most frequent sinus involved (Fig. 2) in CVT (68%) and there was partial or complete occlusion. It was the only sinus involved in 28% of patients and was associated with other sinuses in 40% of the patients. Sigmoid and transverse sinus thromboses were identified in 40% and 48% of the cases (Fig. 2). Other sinuses which were less frequently involved include straight sinus (8%), cavernous sinus (4%) and inferior sagittal sinus (4%). Multiple sinus involvement was seen in 56% of the cases. Internal jugular vein thrombosis was seen in 8%. Cortical vein thrombosis was seen in 20% and deep venous involvement seen in 4% of the patients.

Figure 2: Site of thrombosis in patients with cerebral venous thrombosis



(SSS: superior sagittal sinus; ISS: inferior sagittal sinus; TS: transverse sinus; SS: sigmoid sinus; CS: cavernous sinus; STS: straight sinus)

DISCUSSION

In the present study, the mean age of onset of CVT was 35.7 years which is similar to studies by Deschiens MA et al[4] and Bruijn SFTM de et al[2].The age distribution in our study is similar to most other studies. About 52% of the patients in our series had onset between 15-30 years of the age (Fig. 1). However, 50% of cases of Bousser MG [5] and 30% of Deschiens MA et al[5] were more than 40 years of age.

In our study, only 48% were more than 40 years of age. The sex distribution is 52% males and 48% females which is consistent with other reports by Bousser MG[5] and Daif A et al.[6]About 52% of the patients in our study presented with subacute onset which is similar to the report of Daif A et al[6]The headache was the commonest and earliest symptom in our patients, 84% of cases with CVT presented with headache. Other studies[5,6,7,8]also reported the similar finding.Bousser MG [5]reported the seizures in 29% of patients and Daif A et al[6]noted seizures in 10% of their patients.

Deschiens MA et al [4]reported the seizures in 40% of their cases. In the present study, seizure was present in 44% of patients. Generalized tonic clonic was the commonest type (55%) followed by focal (27%) and focal with generalization seizures (18%). About 47% of the patients had altered sensorium at the time of hospital visit and 4% were comatose. The present study suggested that, the altered sensorium occur in majority of the patients. The incidence of altered sensorium is similar to most other studies, except that Bousser MG [5]noted altered sensorium in only 26% of their patients. The probable reason for the discrepancy in our study from Bousser MG [5] might be that the seizures were less frequent in their study (29%), we noted seizures in 40.4% of the patients.

Seizures, especially with clusters may contribute to altered sensorium and this may be the reason for lesser frequency in Bousser MG [5]study. According to older series by Kalbag RM et al [8]andKrayenbhul [9]focal deficits such as motor or sensory dysphasia, cranial nerve deficits occur in 50-75% of patients. Daif A et al [6]reported the focal deficits in 32% of patients and Zhang Z et al [7]in 32% of their cases. In the present study, 60% of patients had focal neurological deficits. Hemiparesis was the common and seen in 60% of the patients. Among them, monoparesis (12%), multiple cranial nerve palsy (12%) were the common manifestations followed by paraplegia (4%) and sensory deficits (4%).

It is difficult to assess the focal deficits with worsening sensorium. Though CT scan is very useful and non invasive procedure, it may be normal in some cases. The CVT with normal CT scan was reported in 10-20% patients[5,10,11]1Daif A et al [6]found that 42% of their patients had normal scan, where asZhang Z et al [7]series had normal scan in 41% of the cases. In our study CT scan brain was normal in 32% of the patients.

Multiple dural venous sinus involvement was seen in 63.7% of the cases by Bousser MG [5]and 65% of Daif A et al [6]studies. In our study, superior sagittal sinus was the most common sinus involved (Fig. 2). There was partial or complete occlusion of superior sagittal sinus and it was the only sinus involved in 28% of patients. This finding is similar to other studies.

The predisposing factors were identified in 80% of patients byBousser MG [5]and 75% patients by Daif A et al[6]In our study, the predisposing factors were identified in 72% of the patients (Table I). Infective causes were responsible for CVT in 8% of patients in Bousser MG [5]study. In our study, 28% of the patients had infection as the etiological factor. Mastoiditis, sinusitis and tubercular meningitis were the infective causes in our series. Mastoiditis was the most frequent infection.

The non infective etiology was observed in 44% of the cases in our study. Among the non infective etiology, antiphospholipid antibody, oral contraceptive pill usage and systemic lupus erythematosis were common. The antiphospholipid antibody was also observed by Deschiens MA et al [4]in 27.5% of their cases. In the study by Daif A et al,[6]25% of the patients were diagnosed to have behcets disease. One of our patients had protein C and S deficiency. This could not be estimated as a risk factor in the present study, because this investigation was not done in all patients. We suggest that number of patients with thrombophilic condition could be higher and reflects the necessity of this investigation in all patients with CVT.

Einhaupl KM et al [12]in their study of 71 patients, showed significant benefit with heparin therapy even with hemorrhagic infarcts. Daif A et al [6]reviewed 203 patients with CVT and compared the outcome of patients treated with heparin and not with heparin. In the first group 91% patients survived and in second group only 36% survived. In the present study all 25 patients received anticoagulation therapy with heparin until the patient gets stabilized. Once the patients were stable, oral anticoagulants were given.

CONCLUSION

This report shows that the presenting symptoms, signs and demography of patients presenting with cerebral venous thrombosis in a rural practice in a developing country are no different from those reported from developed countries. As infections like sinusitis and mastoiditis have been noted to be significant risk factors, awareness of this potentially treatable neurological disorder among family physicians and allied practitioners in the rural community is essential. The study highlights the importance of prompt neuroimaging study and early proper intervention is vital to prevent morbidity and mortality.

More specialized Neuroimmunology and genetic studies should be made available for this population to identify the cause and improve patient care. Our study highlights that using management strategies similar to developed countries in treating CVT are found to be useful in the successful management of CVT in the rural setting as well.

REFERENCES

1. Kimber J. Cerebralvenous sinusthrombosis.Q J Med 2002; 95: 137-42.
2. Bruijn SFTM de, Haan RJ de, StamJ. Clinical features and prognostic factors of cerebral venous sinus thrombosis in a prospective series of 59 patients. J NeurolNeurosurg Psychiatry 2001**;** 70:105-8.
3. Grover M. Cerebral venous thrombosis as a cause of acute headache. J Am Board FamPract 2004; 17(4)295-8.
4. Deschiens MA, Conard J, Horellou MH et al. Coagulation studies, factor V Leiden, and anticardiolipin antibodies in 40 cases of cerebral venous thrombosis. Stroke 1996; 27(10):1724-30.
5. Bousser MG. Cerebral venous thrombosis: nothing, heparin or local thrombolysis? Stroke 1999; 30: 481-3.
6. Daif A, Awada A, Al-Rajeh S et al. Cerebral venous thrombosis in adults, a study of 40 cases from saudhiarabia. Stroke 1995; 26:1193-5.
7. Zhang Z, Long J, Li W. Cerebral venous sinus thrombosis: a clinical study of 23 Cases. Chin Med J (Engl) 2000; 113(11):1043-5.
8. Kalbag RM, Wolf AL. Etiology of cerebral venous thrombosis. In: cerebral venous thrombosis publ. eds.Kalbagh RM, Wolf AL. vol 1. OxfordUniversity PressLondon, 1967: 238.
9. Krayenbuhl H. Cerebral venous and sinus thrombosis.ClinNeurosurg 1967; 14:1-24.
10. Rao KC, Knipp HC, Wagner EJ. Computed tomographic findings in cerebral sinus and venous thrombosis. Radiology 1981; 140:391-8.

11. Dindagur N, Kruthika-Vinod T, Christopher R. Thrombophilic gene polymorphisms in puerperal cerebral veno-sinus thrombosis. JNeurolSci 2006; 249(1):25-30.
12. Einhaupl KM, Villringer A, Meister W et al.Heparin treatment in sinus venous thrombosis. Lancet 1991; 338 (8767): 597-600.

*Corresponding author: Elanagan Nagarajan
E-Mail: elanagan.nagarajan@gmail.com