

Original Article

Clinical Profile and in Hospital Outcome of Cerebral Venous Sinus Thrombosis at Tertiary Care Centre of Central India

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ABSTRACT

Objectives: The objectives of the study are as follows: Clinical profile and in hospital outcome of cerebral venous sinus thrombosis (CVST) at tertiary care centre in central India. To study clinical presentation and outcomes of CVST.

Material and Methods: A cross-sectional study was performed in a tertiary care centre from October 2020–October 2022. All patients suspected to have CVST based on clinical history and examination were evaluated but only those with confirmed diagnosis (based on neuroimaging) of CVST were taken for study.

Results: Total of 62 patients were studied, most common age group was between 21 and 30 years. Among them males and females are 61.29 and 38.71, respectively. In our study, we found dehydration (62.90%) as the most common predisposing risk factor of CVST, followed by alcohol (48.38%). Headache (83.87%) is the most common symptom and followed by vomiting (59.68%) and convulsion (48.39%), least common was altered sensorium. The most common sinuses involved were superior sagittal sinus (67.74%) and superior sagittal plus sigmoid sinus (14.52%). Among 62 patients, 48 are discharged (77.42%). Death was reported in 14 (22.58%) cases.

Conclusion: CVST is an important cause of intracranial hypertension, seizures and stroke in young people. Clinical presentation is extremely variable and a high index of suspicion is needed. Magnetic resonance imaging brain with magnetic resonance venography is the current diagnostic modality of choice.

Keywords: Cerebral venous sinus thrombosis (CVST), Clinical presentation of CVST, Outcome in CVST

INTRODUCTION

Cerebral venous sinus thrombosis (CVST) was first described by Ribes in 1825. CVST is a cerebrovascular disorder where thrombosis occurs in the dural venous sinus or one or more cerebral veins.

It often affects young to middle-aged patients and more commonly women. Clinical features of CVST are very variable and depend on the site, extent and rate of thrombosis. Headache is the most frequent and often the earliest manifestation.

The diagnosis of CVST requires high index of suspicion because of its varied presentation. Neuroimaging is the cornerstone in the diagnosis of CVST. CVST has an acute case fatality of <5% and almost 80% of patients recover without sequelae.

It has been found that early diagnosis of cerebral venous thrombosis is essential because early treatment decreases morbidity and mortality.

Aims and objectives

The aim of the study was to study Clinical presentation and outcomes of CVST.

MATERIAL AND METHODS

This is a descriptive and cross-sectional study. The study duration was 2 years. The data collection was done on a proforma with informed consent of patient or caregiver. Patients included in the study were admitted to the Medical wards and intensive care unit wards. Non-probability consecutive sampling was done on patients fulfilling.

Inclusion criteria

Inclusion criteria include that all patients aged >12 years suspected to have CVST based on clinical history and examination were evaluated but only those with confirmed diagnosis (based on neuroimaging) of CVST were taken for study.

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Exclusion criteria

The following criteria were excluded from the study:

1. Computed tomography (CT) scan inconclusive of CVST
2. Hypertensive intracerebral haemorrhage
3. Atherothrombotic stroke
4. Patient is not willing to give informed written consent.

Sociodemographic variables such as age (in years) and gender (male/female) were measured. Descriptive statistics were measured for variables such as focal neurological deficits, seizures, headache, diabetes mellitus, hypertension, history of preeclampsia, oral contraceptive pills (OCPs), details of all pregnancy and postpartum complications, underlying risk factors, family history and previous history of CVST. Baselines and routine blood tests were done on all patients, and where possible special tests such as thrombophilia workup and autoimmune profile were done. Non-contrast CT scan was done on all patients at first evaluation. CT brain with IV contrast and CT-venography was done on suspected cases. Patients were categorised based on the sinus involved and whether single or multiple sinuses were affected. Patients were given standard treatment of CVST including adequate hydration, antibiotics, anticoagulants, anti-seizure medications, physiotherapy and other supportive measures. Prognosis of patients was recorded on hospital discharge.

RESULTS

A total of 62 patients (24 females and 38 males) were included in the study. The mean age was 32.01 years. Majority were in the age group of 21–30 years.

Neurological symptoms are summarised in [Table 1].

Headache was the most common symptom, present in 52 (83.87%) patients.

Risk factors are shown in [Table 2].

Dehydration was the most commonly identified risk factor seen in 39 (62.90%).

The most common sinuses involved were superior sagittal sinus and sigmoid sinuses. Superior sagittal sinus was involved in 42 (67.74%) patients and superior sagittal and sigmoid sinus in 9 (14.52%) [Table 3].

In [Table 4] mean systolic and diastolic blood pressure were 131.29 and 79.35 respectively. The homocysteine mean level is 247.36. All 62 patients were given anticoagulation, initially with low molecular weight heparin (LMWH) followed by oral anticoagulant (OAC). Information on outcomes was available for all patients at the time of discharge [Table 5].

DISCUSSION

The clinical presentation of CVST is extremely variable ranging from isolated headache to focal deficit to

Table 1: Clinical presentation.

Risk factors	No. of Cases	Percentage
Diabetes	8	12.90
Hypertension	4	6.45
Headache	52	83.87
Vomiting	37	59.68
Seizure	30	48.39
Fever	17	27.42
Hemiplegia	9	14.52
LOC	11	17.74
Altered sensorium	2	3.23
Impaired vision	4	6.45

LOC: Loss of consciousness

Table 2: Risk factors.

Sign and symptoms	No. of cases	Percentage
Dehydration	39	62.90
Alcohol	30	48.38
Pregnancy	6	9.68
OCP	6	9.68
Infections	13	20.97
Sickling	9	14.52
Autoimmune disease	4	6.45
Homocystenemia	20	32.26

OCP: Oral contraceptive pills

Table 3: Sinuses involved.

Type of sinus involvement	No. of cases	Percentage
Superior sagittal	42	67.74
Superior sagittal sigmoid	9	14.52
Sigmoid transverse	6	9.68
Left sigmoid	4	6.45
Transverse	1	1.61

encephalopathy to coma.^[1] Headache was the most common symptom at presentation as in other studies.^[2,3] Our study had 38 males and 24 females. Hyperhomocysteinemia was seen in 32.26% of patients. In 2004, Cantu *et al.*^[4] reported a correlation of high plasma concentrations of homocysteine and low plasma folate levels and CVST in increased frequency in Mexican population due to low socioeconomic conditions and deficient nutritional status. Infection accounted for 20.97% of CVST cases in our study higher than 12% seen in international society of Cerebral venous thrombosis (ISCVT).

The present study like other studies^[3] confirms that superior sagittal sinus (67.74%) with or without involvement of other sinuses is most common sinus involved. There was no correlation between clinical profile and topographic radiological findings, like involvement of superficial/deep

Table 4: Laboratory and clinical parameters.

Parameter	Mean	SD	Range
SBP	131.29	18.06	100–160
DBP	79.35	7.46	60–90
Haemoglobin	12.04	2.24	8–17
WBC	10.56	6.31	2–25
Platelet	173	29.78	112–254
Total cholesterol	147.45	36.17	85–245
PT/INR	0.99	0.37	0.3–1.9
Homocysteine	247.36	50.50	150–335

SBP: Systolic blood pressure, DBP: Diastolic blood pressure, WBC: White blood cell, PT/INR: Prothrombin time/international normalized ratio

Table 5: Outcome.

Outcome	No. of cases	Percentage
Deaths	14	22.58
Discharged	48	77.42

venous system or the pattern of infarction, to evolve a pattern of diagnostic significance. As most of the patients had extensive involvement of cerebral sinovenous system, contribution of degree of involvement of anatomical structures to a particular clinical profile cannot be reliably predicted.

In majority of the patients, outcome was good. The outcome is that 77.42% are discharged and 22.58% of death occurred. We noticed that factors associated with poor outcomes were fever, altered sensorium and focal neurological deficit at the time of presentation. In ISCVT 3, age 21–30 years, female sex, any malignancy, central nervous system infection, seizures, mental status disorders, intracerebral haemorrhage and deep venous system thrombosis were associated with poor prognosis. Coma and intracerebral haemorrhage were associated with poor prognosis in a study by Bruijn *et al.*^[5] Identification of high risk patients is important because they can be benefited from more aggressive therapeutic interventions.

CONCLUSION

Due to newer neuroimaging techniques, CVST is more commonly diagnosed as a cause of stroke, especially in the young, and should always be thought of as in young patients with stroke.

CVST can easily be treated, which may prevent long-term disability in the young. Clinical presentation is exceptionally diverse and symptoms may progress over weeks or even months. Our study established essential clinical features to suggest this disorder are the new onset of focal headache and headache onset with seizures.

Among the preventable risk factors alcohol consumption is of foremost importance which many studies failed to identify. It was also observed that the most common sinus involved is superior sagittal sinus. Provoked CVST is more common than unprovoked CVST.

Medical management with anticoagulants and supportive measures has excellent clinical outcomes.

Declaration of patient consent

Institutional Review Board (IRB) permission obtained for the study.

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Conflicts of interest

There are no conflicts of interest.

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