



Cerebral Venous Sinus Thrombosis-A Study of Clinicoaetiological Profile

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Abstract

Background & Objective: Cerebral venous sinus thrombosis (CVST) remains a diagnostic & therapeutic challenge for the clinician. This study analyses the epidemiological factor, clinical profile, predisposing factor & radiological characteristics of 41 patients of radiologically confirmed cases of CVST.

Method: This study comprises 41 consecutive patients with radiologically confirmed diagnosis of CVST who were admitted to a tertiary care hospital in western Odisha for the period from January 2014 to February 2017. The diagnosis was confirmed by MRI Brain & MR Venography. The epidemiological, clinical & radiological, laboratory evaluation done & datas were recorded in a structured proforma.

Result: Total number of patients were 41. Female outnumbered males in the ratio of 29:12. The mean age of presentation was 32.1 (age range 15-66 years). The most frequent predisposing factor was OCP use in females & infection & alcoholism in males. The mean duration of symptoms before presentation was 7 (+/- 3.1) days. Most common presenting feature was headache. Transverse sinus sinus was most commonly involved followed by Superior sagittal sinus.

Conclusion: CVST presents with varied symptom & sign. Females were mostly affected. Headache was the most frequent symptom. OCP use in females & infection in males were the most common presenting feature.

Introduction

Cerebral venous sinus thrombosis (CVST) is the thrombosis affecting cerebral veins & sinuses. It can mimic many neurological conditions & can present as headache, benign intra cranial hypertension (BIH), encephalopathy or stroke^[1]. Recent reports indicate that CVST incidence is more common than previously assumed due to greater awareness & availability of newer imaging modalities^[2]. Previously most reported incidence were based on autopsy studies and range from 0.1 % of 12500 consecutive autopsies to 9% of all

death resulting from cerebrovascular causes^[3]. There is a greater prevalence of CVST in the puerperal period in south India^[4]. The data from NIMHANS Bengaluru indicate that 90% of CVST were women & majority were in puerperal period. We conducted this study to know the clinicoaetiological profile of CVST cases in this region.

Methods

This prospective study comprised of 41 cases with radiologically proven CVST. This study was conducted at a tertiary care hospital in western

Odisha between the period from January 2014 to February 2017. The epidemiological, clinical & radiological datas were recorded in a structured proforma. Detailed neurological evaluation were done. Laboratory evaluation included CBC, ESR, routine blood chemistry along with prothrombin time, APTT, INR, CRP, ANA & d-Dimer assay. The aetiological work up for thrombophilia screening like protein C & S, antithrombin III, lupus anticoagulant, anti cardiolipin antibody (ACLA), serum homocystiene & factor V leiden mutation were done.

Results

Total 41 numbers of radiologically confirmed CVST cases were included in this study. Female outnumbered males in the ratio of 29:12. The mean age of presentation was 32.1 (age 15-66 years). Most of the cases were in the age group of second to fourth decade. (Table-1)

Table-1 Distribution of patients according to sex & age

SEX	Number	Percentage
Male	12	29.3
Female	29	70.7
AGE IN YEARS		
<20	7	17.0
21-40	27	65.8
41-60	5	12.1
>60	2	4.8

Most common presenting feature was headache. Other presenting features were vomiting, seizure, altered sensorium, motor sensory deficit & papilloedema. The details of clinical presenting feature is recorded in table-2.

Table-2-Initial clinical presentation of patients

Syptom/sign	Number of patients	Percentage
Headache	38	92.6
Vomiting	30	73.1
Focal seizure	9	21.9
Generalised seizure	7	17.0
Altered sensorium	9	21.9
Aphasia	4	9.7
Motor deficit	12	29.2
Sensory deficit	7	17.0
Cranial nerve involvement	8	19.5
Papilloedema	20	48.7

Presentation was acute in 6 (14.6%), subacute in 30 (73.2%) & chronic in 5 (12.2%) cases. (Table-3)

Table-3 Distribution of patients according to onset of symptoms

Presentation	Number	Percentage
Acute	6	14.6
Subacute	30	73.2
Chronic	5	12.2

Four common type of syndromic presentation were found. These are Stroke like presentation 24 case (58.5%), isolated seizure 3 cases (7.3%), encephalopathy 2 cases (4.9%) & BIH like presentation 12 cases. (Table-4)

Table-4 Syndromic presentation types

Types	Number	Percentage
Stroke like	24	58.5
Isolated seizure	3	7.3
Encephalopathy	2	4.9
Benign intracranial hypertension	12	29.2

Known risk factor were present in 19 (46.4%) cases. Among the risk factors OCP use was the most common risk factor amongst females followed by peripartum state. OCP was used in most of the cases for menstrual regularisation. Local infection (mastoiditis, CSOM, sinusitis & meningitis) were found as a risk factor in 2(4.8%) cases. Diabetes mellitus was found to be associated with 1(2.4%) case. In 10 cases thrombophilia factor assay was done. 3(30%) cases had one or more coagulation factor abnormalities. Alcoholism, anaemia & dehydration were among the other risk factors. Multiple risk factor were present in 3(7.3%) of cases. Infection & alcoholism were the most common aetiological factor in male patients. No risk factor were detected in 22 (53.6%) cases. (Table-5)

Table-5 Predisposing factor (Number & percentage more than 100 is due to presence of multiple risk factors)

Factor	Number	Percentage
Oral contraceptive	5	12.2
Pregnancy/puerperium	2	4.8
Head trauma	1	2.4
Local infection	2	4.8
H/O of DVT/CVT	1	2.4
Diabetes mellitus	1	2.4
Anaemia	1	2.4
Alcoholism	2	4.8
Prothrombotic factor	3	7.3
Dehydration	1	2.4
Multiple risk factor	3	7.3
No detectable risk factor	22	53.6

Transverse sinus involvement followed by superior sagittal sinus involvement were the most common findings. Multiple sinus involvement were more common than single sinus involvement.

Table-6 Venous sinus involvement (Number & percentage more than 100 is due to multiple sinus involvement)

Sinus	Number	Percentage
Superior sagittal	18	43.9
Transverse	21	51.2
Straight	5	12.1
Sigmoid	16	39.0
Cavernous	1	2.4
Jugular vein	1	2.4
Cortical vein	2	4.8
Multiple sinus	23	56.0

Discussion

In this series of 41 cases of CVST there is a female preponderance. It correlates with other studies^[5,6,7,8]. Recent studies done in India & abroad show a male dominance. The increased incidence of female cases in our series relates to OCP use & puerperal hypercoagulable state. The mean age in the present study was 32.1 year. Larger study series from India show mean age varying from 31.3 to 48.7 years^[9].

Headache, vomiting, papilloedema & seizure were the most common presenting feature in this study. In the NIVSAR cohort 88.3 % patients had headache^[10]. In most of the cases headache

precedes the development of all other features. Seizure was seen in 35%-55% of all patients with CVST even with a higher frequency (76%) in peripartum CVST^[11]. In a retrospective study Kalita et al found a predominance of seizure in CVST cases^[12].

Papilloedema was found very commonly in chronic cases. Sixth cranial nerve involvement was present next to papilloedema.

Four common type of syndromic presentation were found. These are Stroke like presentation (58.5%), isolated seizure (7.3%), encephalopathy (4.9%) & BIH like presentation (29.2%). In NIVSAR cohort syndrome of raised intracranial pressure was found in 18.2% of patients. In other studies it was found in 10- 29% of cases. Patients presenting as encephalopathy is described in literature in varying proportion from 6-29% of cases^[13,14].

Among the risk factors OCP use was the most common risk factor amongst females followed by peripartum state. OCP was used in most of the cases for menstrual regularisation. Our study correlates with previous studies done in India. The recent NIVSAR cohort study reported a low incidence of CVST in postpartum or pregnant state. Better obstetric care could be the possible cause for this change.

There is sufficient evidence that OCP use & CVST has a causal relationship & the great majority of young non pregnant women with CVST are OC user and the risk increases with the presence of hereditary prothrombotic state. In the international study on cerebral vein & dural sinus thrombosis (ISCVT) cohort of 624 adults with CVST 46% were on OC pill^[10]. In a study by Khelani et al show an incidence of 14%^[15]. In the NIVSAR study 11.4% had usage of OCP.

Local infection (mastoiditis, CSOM & sinusitis) & meningitis were found as a risk factor in 4.8% cases. Infection as a predisposing factor has been reported by various authors^[16,17,18]. Improved health awareness, hygiene & availability of antibiotic & chemotherapeutic agents has reduced the incidence of CVT in these cases.

Diabetes mellitus was found to be associated with 2.4% of cases. In the literature few case reports are available which reveals association of diabetes & its complications associated with CVST. In our series none of our diabetes patients presented with complications.

In 10 cases thrombophilia factor assay was done. 30% cases had one or more coagulation factor abnormalities. Prothrombotic condition as a risk factor has been described in literature from the western countries. From India Pai et al found 18% cases to be positive for thrombophilia marker^[16].

Transverse sinus involvement followed by superior sagittal sinus involvement were the most common findings. Multiple sinus involvement were more common than single sinus involvement. Study from India & middle east show more common involvement of superior sagittal sinus^[9,19,20].

Conclusion

Cortical venous sinus thrombosis is an important & treatable cause of Stroke. Female cases outnumbered males in our series. Majority of the patients were in the age group of third to fourth decade. Headache associated with raised ICP was the most common clinical presentation. Among the risk factors OCP use in females & ENT infection and alcoholism in males were common. MRV study showed incidence of transverse sinus involvement more common than others. Further studies with inclusion of more number of patients are necessary. .

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