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Original Research Paper

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A CROSS-SECTIONAL STUDY ON CLINICAL, SOCIO-DEMOGRAPHIC PROFILE AND RISK FACTORS OF CEREBRAL VENOUS SINUS THROMBOSIS IN TERTIARY CARE CENTER.

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ABSTRACT **Background:** Understanding the natural history of Cerebral Venous Sinus thrombosis is important for optimal management of the condition. Once the risk factors are identified it is possible to avoid or modify these risk factors or to use active prophylaxis to reduce morbidity and mortality. Hence present study was planned to study clinical profile of Cerebral Venous Sinus Thrombosis in order to find important risk factors, demographic profile, clinical presentations and mortality associated with it. **Material & Methods:** Present cross-sectional study was conducted during period July 2010- June 2011 on admitted and diagnosed as a case of Cerebral Venous Sinus Thrombosis in Government medical college and hospital, Latur, Maharashtra state. **Results:** More than half of study subjects were young adults. Majority of study subjects were affected in spring 30.56% followed by rainy seasons (27.78%). Most common sinus involved in CVST was superior sagittal sinus in 28 (77.78%) patients followed by transverse sinus in 16 (44.44%) patients. Mortality occurred in 22.22 % study subjects. **Conclusion:** In CVST patients, in males most common risk factor was infection and in females most common risk factor was puerperium.

KEYWORDS : Cerebral Venous Sinus Thrombosis, clinical profile, thrombus.

INTRODUCTION

Thrombosis can be considered as "hemostasis in the wrong place and at the wrong time," with dysregulation of one or more elements of haemostatic system contributing to formation of a platelet-fibrin thrombus that often occludes blood vessels, leading to pathologic complications. [1] It is a major cause of morbidity and mortality in a wide range of arterial and venous disease and patient populations.

The annual incidence of cerebral venous sinus thrombosis (CVST) is currently estimated to be 3–4 cases per 1 million people in which three out of four patients are women and one out of eight patients will die or remain handicapped as a result of CVST. [2] This distinct condition frequently affects young adults and children. Puerperal CVST has been reported 10-12 times more frequent in India than in west. [3] CVST has an acute case fatality of less than 5%, and almost 80% of patients recover without sequelae. However, patients surviving the acute phase of CVST are at risk of a number of complications such as recurrence of any thrombotic events (7%), recurrence of CVST (2–12%), seizures (5 to 32%), visual loss due to optic atrophy (1 to 5%), presence of dural fistula and neuropsychological and neuropsychiatric sequelae characterized by aphasia, abulia and depression. [4]

The prevailing belief that venous thrombosis in the Asian population is less than in the western population has been disproved by recent studies and there appears no reason to believe that it should be any different in India. The incidence of venous thrombosis in India is highly underestimated because of lack of adequate studies highlighting the incidence of venous thrombosis especially in medical patients, existence of a few but conflicting studies in post-surgical patients and paucity of data from autopsied patients as autopsy is being done in very few institutions in India. [5] Thus this study was conducted to study sociodemographic, clinical profile and risk factors associated with cerebral venous sinus thrombosis.

MATERIALS AND METHODS:

The present hospital based cross-sectional study was conducted in Government Medical College and Hospital, Latur in Maharashtra state during period July 2010 to June 2011. Ethical committee clearance was taken before the start of the study.

Study was conducted on total 36 study subjects who were hospitalized during study period with history suggestive of Cerebral Venous Sinus Thrombosis and confirmed by radiological investigations were included the study. Patients less and 12 years of age and not willing to participate in the study were excluded.

Data was collected by using standardized assessment forms (questionnaire). Purpose of the study was carefully explained to the patient and/or his/her relatives and written informed consent was taken. Information collected included demographics, history of present illness, significant past and family history, history of predisposing risk factors such as puerperium, immobilization, OC pill use, malignancy and physical examination findings.

Investigations like CBC, Peripheral smear, ESR, BT, Cl.T, PT, aPTT, INR, BSL(R), Sr. Creatinine, Blood Urea, Sr. Bilirubin, ECG, CXR PA, Lower Limb Venous Doppler, CT/MRI Brain, MR Venogram were done. Outcome of each patient was classified as either discharged or death. Data thus obtained was tabulated and statistically analyzed using percentage, mean, standard deviation.

RESULTS:

Table 1. Age-wise Distribution Of Patients Of Cerebral Venous Sinus Thrombosis

Sr. No.	Age (yrs)	CVST	
		No.	%
1.	< 20	2	5.56
2.	21 to 40	26	72.22
3.	41 to 60	5	13.89
4.	>60	3	8.33
Total		36	100

Total 36 patients were included in study subjects. Among these 24 were female and 12 were male. Mean age of study subjects were 32.19 + 14.47 years. Minimum age of study participant

was18 and maximum was 78 years. More then half of study subjects were young adults i.e. between age group 72.22%. Only %.56% were less than 20 years old.

Table 2. Distribution Of Study Subjects According To Occupation.

Sr. No.	Occupation	CVST	
		No.	%
1.	Clerk	1	2.78
2.	Driver	1	2.78
3.	Housewife	9	25
4.	Farmer	2	5.55
5.	Laborer	17	47.22
6.	Other*	6	16.67
Total		36	100

*Other includes unemployed patients, non-working old patients.

While considering the occupation of study subjects, it was found that majority were labourers (47.22%). 25% were housewife.

Table 3. Distribution Study Subjects According To Season In Which They Get Affected.

Sr. No.	Season	CVST	
		No.	%
1.	Winter	8	22.22
2.	Spring	11	30.56
3.	Summer	7	19.44
4.	Rainy	10	27.78
Total		36	100

Majority of study subjects were affected in spring 30.56% followed by rainy seasons (27.78%)

Table 4. Clinical Features Of Cerebral Venous Sinus Thrombosis.

Sr. No.	Clinical Features*	No. of Patients	Percentage
1.	Headache	31	86.11
2.	Papilloedema	25	69.44
3.	Focal Neurological Deficit	17	47.22
4.	Convulsions	16	44.44
5.	Altered Sensorium	11	30.56
6.	Fever	4	11.11

*One patient may have more than 1 clinical feature

Headache (86.11%), papilledema (69.44%) were most common sign and symptoms of study subjects. 11% study were having fever.

Table 5. Sites Of Thrombosis In CVST Patients.

Sr. No.	Sites of thrombosis in CVST patients*	No. of Patients	Percentage
1.	Superior Sagittal Sinus	28	77.78
2.	Transverse Sinus	16	44.44
3.	Sigmoid Sinus	8	22.22
4.	Straight Sinus	6	16.67
5.	Internal Cerebral Vein	3	8.33
6.	Cavernous Sinus	2	5.56

*More than one site may be involved in one patient

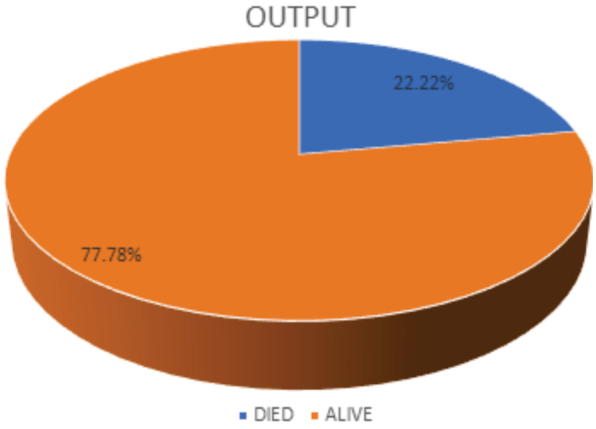
Most common sinus involved in CVST was superior sagittal sinus in 28 (77.78%) patients followed by transverse sinus in 16 (44.44%) patients, sigmoid sinus in 8 (22.22%) patients and straight sinus in 6 (16.67%) patients.

In males most common risk factor was infection in 5 (41.67%) patients and in females most common risk factor was puerperium in 14 (58.33%) patients followed by pregnancy in 4 (16.67%) patients and OC pill use in 3 (12.5%) patients.

Table 6. Sex-wise Distribution Of Risk Factors For Cerebral Venous Sinus Thrombosis.

Sr. No.	Risk Factors#	CVST				Total (n=36)	
		Male (n=12)	%	Female (n=24)	%	No.	%
1.	Puerperium	00	0.00	14	58.33	14	38.89
2.	Infection	05	41.67	01	4.17	06	16.67
3.	Pregnancy	00	0.00	04	16.67	04	11.11
4.	OC Pills	00	0.00	03	12.50	03	8.33
5.	Malignancy	01	8.33	01	4.17	02	5.56
6.	P/H/O Venous Thrombosis	02	16.67	00	0.00	02	5.56
7.	Smoking	02	16.67	00	0.00	02	5.56
8.	Other*	03	25	01	4.17	04	11.11

#One patient may have more than one risk factor.
*Other includes clinically no obvious risk factor.



Pie diag.1: Mortality In Study Subjects.
Out of 36 patients, 8 Patients were died and 28 were alive.

DISCUSSION

Mean age of CVST group was 32.19 years with majority of patients in age group between 21 to 40 years (26 patients, 72.22%). In a study of **Halesha BR et al** mean age of CVST population was 29.06 years with 42% of patients in the age group between 21 to 30 years.[6] In a study carried out by **Mehta SR et al** similar age group i.e. 21 to 40 years was found to be involved most commonly (77.8%). [7]

Out of 36 patients of CVST, 12 (33.33%) were males and 24 (66.67%) were females with M:F ratio of 1:2. In a study of **Halesha BR et al**, out of total 50 patients, 10 (20%) were males and 40 (80%) were females with M:F ratio of 1:4. [6]

In the present study, in CVST population, most common clinical features were headache (86.11%) and papilloedema (69.44%). Other features were focal neurological deficit (47.22%), convulsion (44.44%), altered sensorium (30.56%) and fever (11.11%). The clinical features were comparable with study of Halesha BR et al [6] and study of Brujin de SFTM et al [8]. In study of **Halesha BR et al**, headache was the most common presenting complaint (90%) followed by focal deficit (48%), convulsion (44%), papilloedema (40%), altered sensorium (24%).[6] In study of **Brujin de SFTM et al**, headache was the most frequent symptom present in 95%, followed by seizures (47%), focal deficit (43%), papilloedema (41%). [8]

In present study, in CVST patients, most common site of involvement was superior sagittal sinus (SSS) (77.78%), followed by transverse sinus (44.44%), sigmoid sinus (22.22%), straight sinus (16.67%), internal cerebral vein

(8.33%), cavernous sinus (5.56%). These findings were comparable with studies of Stolz et al and Halesha BR et al. In study of **Stolz E et al**, SSS was involved most commonly (72.2%), followed by transverse sinus (38%), sigmoid sinus (20.3%), straight sinus (7.6%) and internal cerebral vein (6.3%). [96] In study of **Halesha BR et al**, SSS was involved most commonly (82%), followed by lateral sinus (transverse and sigmoid sinus) (68%), straight sinus (16%) and cavernous sinus (2%). [9]

In the present study, most common risk factor for CVST was puerperium (38.89%). Other risk factors were infection (16.67%), pregnancy (11.11%), OC pill use (8.33%), malignancy (5.56%), past history of venous thrombosis (5.56%) and smoking (5.56%). Clinically no obvious risk factor was found in 11.11% patients. Similar to present study, in the study from South India by **Halesha BR et al**, puerperium was the most common risk factor found in 50% patients. Other risk factors were OC pill use (6%), infections (6%), pregnancy (4%) and no obvious cause in 20% patients. [86] However in studies from west, puerperium was a risk factor in <15% patients and OC pill use was implicated in 54 to 77% patients. [2,8]

In CVST group of patients, in males most common risk factor was infection (41.67%). Most common risk factor in females was puerperium (58.33%). Other risk factors in females were pregnancy (16.67%) and OC pill use (12.5%). In the study from South India by **Halesha BR et al**, puerperium was the most common risk factor in females (62.5%). [6] In a study from Canada by **Hinnell C et al**, OC pill use was a major risk factor in females (45%) and chronic mastoiditis i.e infection was the most common predisposing factor in males (27%). [10]

In the present study, in CVST group, out of 36 patients, 8 (22.22%) patients died. Comparable results were found in a study of **Stolz E et al** [9] and **Halesha BR et al** [6] where mortality rates were 15% and 18% respectively.

CONCLUSION

CVST is more common in females with most females in peripartum period. CVST commonly presents with headache, focal neurological deficit. Most common sinus involved is superior sagittal sinus followed by transverse sinus and sigmoid sinus. Most common risk factors for CVST are puerperium, infection and pregnancy.

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