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Clinical Profile of Cortical Venous Sinus Thrombosis

KEYWORDS: Cortical venous sinus thrombosis, Superior sagital sinus, Hypercoagulable state.

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ABSTRACT *We conducted our study in SKNMC & GH in Pune from December 2013 to March2016. 34 adult patients with CVST confirmed by MRI and MRV were studied cross sectionally. Out of 34 patients, there were 16 males (47.05%) and 18 females (52.94%). Headache was the most common symptom in 24/34 (70.58%), followed by seizures 8/34 (23.52%). In majority of the patients 16/34 (47.05%), no predisposing factors were identified. Infections were found in 4/34 (11.76%), post partum in 5/34(14.70%),oral contraceptive pills in 4/34 (11.76%). Hypercoagulable states were seen in 3/34(8.82%) The most common sinus involved was superior sagital sinus in 17(50 %) patients. Transverse sinus involvement in 11(32.35%) patients. Sigmoid sinus involvement in 12(35.29%) patients. All patients were treated with low molecular weight heparin overlapping with warfarin.*

Conclusion:

Cortical venous sinus thrombosis is one of the most important and treatable medical condition in medical practice. Because of its varied and complex presentation it can not be clinically diagnosed so high index of suspicion is mandatory. Neuroimaging is one of the most important goal standard investigation. Taking into consideration various etiological factors it can be effectively treated with anticoagulant agents and patients can be offered satisfactory outcome.

Introduction:

Cortical venous sinus thrombosis (CVST)has diverse clinical presentation and it is under diagnosed medical condition which keeps physicians guessing. CVST mimics lot many neurological syndromes like cerebrovascular accidents, demyelinating disorders, seizure disorders, intracranial space occupying lesions etc. so timely diagnosis of CVST is mandatory for urgent management of patients. CVST has varied aetiologies , risk factors and imaging findings based on time of presentation. Clinical presentations of CVST are headache, convulsions, altered sensorium, focal neurological deficits, bilateral pyramidal signs, cranial neuropathies, subacute encephalopathies, proptosis, raise intracranial tensions and in rare cases pituitary hypofunction have been reported. Various etiological factors mentioned in medical literature are dehydration, oral contraceptive pills,post puerperium state, neuro infections, hypercoagulable states, hematological malignancies and chemotherapies etc. Various therapeutic interventions mentioned are pharmacotherapy like oral anticoagulations and use of low molecular weight heparins, catheter guided endovascular thrmbolysis, and in severe cases in raised ICT unilateral or bilateral craniotomy have been practiced all over the world.

Material and Methods:

This is cross sectional study which was conducted in SKNMC&GH, Pune with 34 newly diagnosed CVST patients from December 2013 to March 2016. Doctors were trained for high suspicion of CVST patients in out patient department and emergency room. Detail history of the symptoms such as headache , vomiting, seizure and family history were taken into consideration. The clinical diagnosis was confirmed by MRI brain (1.5 T) with MR Venography. Various etiological factors such as are dehydration, oral contraceptive pills,post puerperium state, neuro infections, hypercoagulable states, hematological malignancies and chemotherapies etc were taken into consideration. Complete blood work up with thrombophilia screening was done in patients with high level of suspicion , serum homocysteine and blood sugars were done.2D Echo, ultrasonography of abdomen and pelvis, chest Xray were done in all patients. All patients were started on low molecular weight heparin overlapping with warfarin and were given supportive treatment in the form of mannitol, dexamethasone and antiepileptics wherever necessary. One patient had severe form of CVST with raised intra cranial tension with altered sensorium which was subjected for decompression craniotomy. The INR was maintained between 2-2.5.

Results:

Sex wise distribution

Thirty four patients (n = 34) showed evidence of dural venous sinus thrombosis. Out of 34 patients, there were 16 males (47.05%) and 18 females (52.94%) as shown in Table 1.

Table 1

Total patients	Male	Female
34	16 (47.05%)	18 (52.94%)

Age wise distribution

Age ranged from 21 years to 70 years. Out of 34 cases, 14 (41.17%) belonged to 21-30 years age group, 11 (32.35%) belonged to 31-40 years age group and 5 (14.70%) belonged to 41-50 years age group, 2 (5.88%) belonged to 51 to 60 years, 2(5.88%) belonged to 61 to 70 years as given in Table 2

Table 2

Age of the patients	Total cases (34)
21-30	14 (41.17%)
31-40	11 (32.35%)
41-50	5 (14.70%)
51-60	2 (5.88%)
61-70	2 (5.88%)

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Signs and symptoms

Headache was the most common symptom in 24/34 (70.58%), followed by seizures 8/34 (23.52%), neurological deficit 4/34 (11.76%), diminished vision in 5/34 (14.70 %) and vomiting associated with headache in 6/34 (17.64%) as given in Table 3.

Table 3

Symptoms	Cases
Headache	24/34 (70.58%)
Seizures	8/34 (23.52%)
neurological deficit	4/34 (11.76%)
diminished vision	5/34 (14.70 %)
vomiting associated with headache	6/34 (17.64%)

Duration of symptoms

Most of the patients presented with more than one symptom. 12/34 (35.29%) patients presented with acute symptoms within seven days, 8/34 (23.52%) within 14 days, 9/34 (26.47%) within 30 days, 5/34 (14.70%) within 3 months and [Table 4].

Table 4

Duration of presentation	Cases
< 7 days	12/34 (35.29%)
< 14 days	8/34 (23.52%)
< 30 days	9/34 (26.47%)
< 3 months	5/34 (14.70%)

Predisposing factors

In majority of the patients 16/34 (47.05%), no predisposing factors were identified. Infections were found in 4/34 (11.76%), post partum in 5/34(14.70%),oral contraceptive pills in 4/34 (11.76%). In two cases (5.88%) was associated with alcohol intake with dimorphic anaemia. Hypercoagulable states 3/34(8.82%)were seen as shown in Table 5

Table 5

Predisposing factors	Cases
Idiopathic	16/34 (47.05%)
Infections	4/34 (11.76%)
post partum	5/34(14.70%)
oral contraceptive pills	4/34 (11.76%)
alcohol intake with dimorphic anaemia	2/34(5.88%)
Hypercoagulable states	3/34(8.82%)

Location

In present study, the most common sinus involved was superior sagital sinus in 17(50 %) patients. Transverse sinus involvement in 11(32.35%) patients. Sigmoid sinus involvement in 12(35.29%) patients. Straight sinus involvement in 2(5.88%) patients. Internal jugular vein was involved in 2(5.88%)patients. In our study there was no patient having involvement of deep venous system and isolated cortical vein as given in Table 6.

Table 6

Location of thrombus	Cases
superior sagital sinus	17(50 %)
Transverse sinus	11(32.35%)
Sigmoid sinus	12(35.29%)
Straight sinus	2(5.88%)
Internal jugular vein	2(5.88%)

Changes in brain parenchyma

Brain parenchymal abnormalities in CVST are diffuse cerebral edema, non-hemorrhagic and hemorrhagic infarcts. In this study, 19/34 (55.88%) cases were normal, 9/34 (26.47%) had non-hemorrhagic infarct and 6/34 (17.64%) had hemorrhagic infarction as shown in Table 7

Table 7

Brain Parenchyma	Cases
Normal	19/34 (55.88%)
non-hemorrhagic infarct	9/34 (26.47%)
hemorrhagic infarction	6/34 (17.64%)

Discussion:

CVST amounts to around 1% of cerebrovascular patients. In our study there was more female preponderance 18 females (52.94%)which is seen in various other studies. However in study conducted by Ramesh Joshi et al[1]showed more affection of males (56.3%) against 16(47.05%) in our study. In our study age range of patients was between 21 to 70 years. As far as clinical presentation of patients is concerned headache was the commonest symptom followed by seizure, vomiting, diminished vision and neuro deficits. However in our case study cranial nerve palsies, proptosis, subacute encephalopathies, coma etc. were absent. All patients in present study presented within time range of 7 to 90 days with 12 patients(35.29%) within 1 week. In present study 16 patients had no observable etiological factor. 4 patients(11.76%) presented with chronic otitis media with meningitis. Most common etiological factors identified in females were post partum status and oral contraceptive pills intake for more than 6 months[2] .N. Ashja Zadeh et al[3] study reported similar occurrence of CVST in females taking oral contraceptive pills for 1 month duration during fasting for Ramadan. Michael o kinney et al[4] reported occurrence of intracranial hypotension and CVST in 2 postpartum patients having headache. In our study we did not get any Patient of CVST with pregnancy. Anne-Eva van der wijk et al[5] claimed that there is reduced myogenic tone and outward hypotrophic remodeling of corical vein of Gallen during pregnancy. In present study 2 patients (5.88%) were alcoholics with severe iron deficiency anaemia Jonathan Coutinho et al [6]study reported around 27% patients with iron deficiency anaemia claiming that it is one of the risk factors for CVST. In our study 3(8.82%) patients were diagnosed to have hypercoagulable disorders namely paroxysmal nocturnal hemoglobinuria, homocysteinaemia and protein c deficiency. Bombelli T et al [7]study revealed similar occurrence of hypercoagulable disorders associated with venous thrombosis. Radiological neuro imaging in present study revealed involvement of superior sagital sinus in 17(50%) followed by sagital sinus in 12(35.29%) and transverse sinus in 11(32.35%). Khaladkar et al[8] study revealed similar involvement of cortical venous sinuses. Present study lacked presence of involvement of deep venous system and isolated crtical vein. Sabril hakim Sidek et al [9]study described 24 cases of isolated deep venous system involvement with CVST. In present study non haemorrhagic infarctions was seen in 9 patients(26.47%) and haemorrhagic infarctions in 6 patients (17.64%)

In present study all patients were started on low molecular weight heparin overlapping with warfarin and were given supportive treatment in the form of mannitol, dexamethasone and antiepileptics wherever necessary. One patient had severe form of CVST with raised intra cranial tension with altered sensorium which was subjected for decompression craniotomy. None of our patients subjected for endovascular interventions. Jonathan Coutinho et al [10,11] mentions decompression craniotomy in severe CVST with haemorrhagic transformation. X-B Guo S et al [12]have tried endovascular thrombolysis. In this study there was no patient with post traumatic CVST[13] and isolated cortical vein thrombosis[14] . Similar clinical profile and etiological factors are observed in study conducted by Narayan et al[15].

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Conclusion:

Cortical venous sinus thrombosis is one of the most important and treatable medical condition in medical practice. Because of its varied and complex presentation it can mimic various pathological conditions like cerebrovascular accidents, intracranial space occupying lesions, seizure disorders etc. As there are no definitive neurological symptoms and signs it can not be clinically diagnosed so high index of suspicion is mandatory. Neuroimaging is one of the most important goal standard investigation. Taking into consideration various etiological factors it can be effectively treated with anticoagulant agents and patients can be offered satisfactory outcome.

Our study has small sample size and no follow up neuroimaging of patients. This study had limitations due to non availability of neuro interventional treatments like catheter guided local thrmbolysis, thrombosuction.

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