Original Research Article

The changing face of CSVT: Time to rethink and intervene

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Abstract

Background: Thrombosis of the cerebral venous sinuses (CSVT) is not an uncommon form of stroke. Usually affects young individuals.
Aim: To compare the clinical profile of Cerebral venous thrombosis patients.
Materials and methods: It was an observational study, comparing the epidemiological and etiological profile of patients with CVT during two time periods
Results: This study group consisted of 130 patients, 63 patients in cohort 1 (2013/14), and 67 Patients in cohort 2 (2015-2016), were male noted in 27% and female were noted in 73% in cohort 1 (2013-14. In cohort 2 (2015-2016) male were noted in 39% and female were 61%.The data in rural were 81.5% and urban were 18.5% in cohort 1 and in cohort 2, Rural were noted in 66% and urban 34%.Common risk factors were postpartum status 31 were noted in cohort 1 and 18 were noted in cohort 2. In MRI brain Parenchymal changes cohort 1 consisted 51 and cohort 2 consisted 38. Headache was the common clinical presentation in the patients and next followed by altered sensorium. Time of onset of symptoms in the both cohorts was at 6-10 days in most of the patients, risk factor associated in both cohorts was postpartum status.
Conclusion: CSVT is a multi-factorial condition with gender-related specific causes. Fifty years ago, CSVT was a mortal condition, but with the introduction of neuroimaging, the mortality rates have become minimal. CSVT is effective and economical.

Key words

Brain, Cerebral venous sinus thrombosis, Cerebral venous, Sinus thrombosis.

Introduction

Cerebral sinus venous thrombosis (CSVT) is a rare phenomenon that can be seen with some frequency in young patients. CSVT is a multi-factorial condition with gender-related specific causes, with a wide clinical presentation, the leading causes differ between developed and developing countries, converting CSVT in a condition characterized by a highly variable clinical spectra, difficult diagnosis, variable etiologies and prognosis that requires fine medical skills and a high suspicious index. Cerebral sinus venous thrombosis (CSVT) is a common cause of stroke in India, with the wide spread use of magnetic resource imaging (MRI), many more cases of CSVT are being diagnosed than before. It is important to the aware of the varied clinical presentation and course of CSVT, as most of these patients have an excellent out come if treated early and appropriately. Previous studies from India on CSVT were done before the wide spread availability of MRI. Narayan, et al. [1] the aim of the present study was to investigate the risk factors. Cerebral venous thrombosis influence of risk factors and imaging findings on prognosis was investigated by many authors [2, 3].

This work aimed to review current knowledge about CSVT including its pathogenesis, etiology, clinical manifestations, diagnosis, and treatment.

Materials and methods

It was an observational study, comparing the epidemiological and etiological profile of patients with CVT during two time periods, August 2013 to July 2014 (Cohort 1) April 2015 to March 2016 (Cohort2), in the department of Neurology, GGH Guntur has established a world class stroke unit which was also approved by ICMR for enrolment in Indian stroke trials.

Inclusion criteria

All the patients suspected to have CSVT were subjected to thorough clinical evaluation by neurologists.

Exclusion criteria

The clinical diagnosis was confirmed by brain computer tomography (CT), Brain MRI, Scan and MR venography.

The information of all the patients fulfilling the criteria of CVST of both genders was entered in a data entry sheet. All the patients were treated in the intensive care unit under standard guidelines and protocols. Patients with diagnosis of CVST were treated in intensive care unit. Patients with diagnosis of CVST were treated with intravenous fluids to correct dehydration, decongestive agents, anticonvulsant drugs, antibiotics, low–molecular weight heparin (LMWH) (if not contraindicated), decompressive craniotomy, methylcobalamin and folic acid supplementations, and so on. All patients in whom the diagnosis of CVST was confirmed by computed tomography/ MRI brain venogram were included in this study. All patients underwent basic investigations, such as hemogram, electrolytes, blood sugar levels, renal function tests, and chest radiographs. Liver function tests, coagulation studies, inflammatory markers, and homocysteine levels were done in selected patients because of financial constraints.

Results

This study group consists of 130 patients, 63 patients in cohort 1(2013/14), and 67 Patients in cohort 2 (2015-2016), were male noted in 27% and female were noted in 73% in cohort 1 (2013 -14). In cohort 2 (2015-2016) male were noted in 39% and female were 61%.The data in rural were 81.5% and urban were 18.5% in cohort 1 and in cohort 2, Rural were noted in 66% and urban 34% (**Table – 1**).

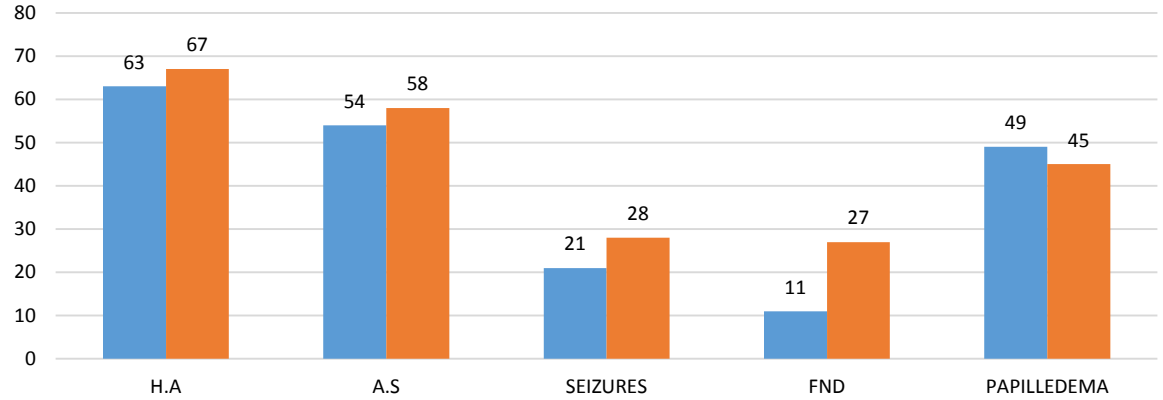
Headache was the common clinical presentation in the patients and next followed by altered sensorium (**Figure – 1**). Time of onset of symptoms in the both cohorts was at 6-10 days in most of the patients (**Figure – 2**). In MRI brain Parenchymal changes (**Figure – 3**) cohort 1 consist 51 and cohort 2 consists 38 (**Figure – 4**).

Causes of CSVT in both the cohort groups was as per **Figure – 5**. Risk factor associated in both cohorts is postpartum status was as per **Figure – 6**.

Table - 1: Demographic data.

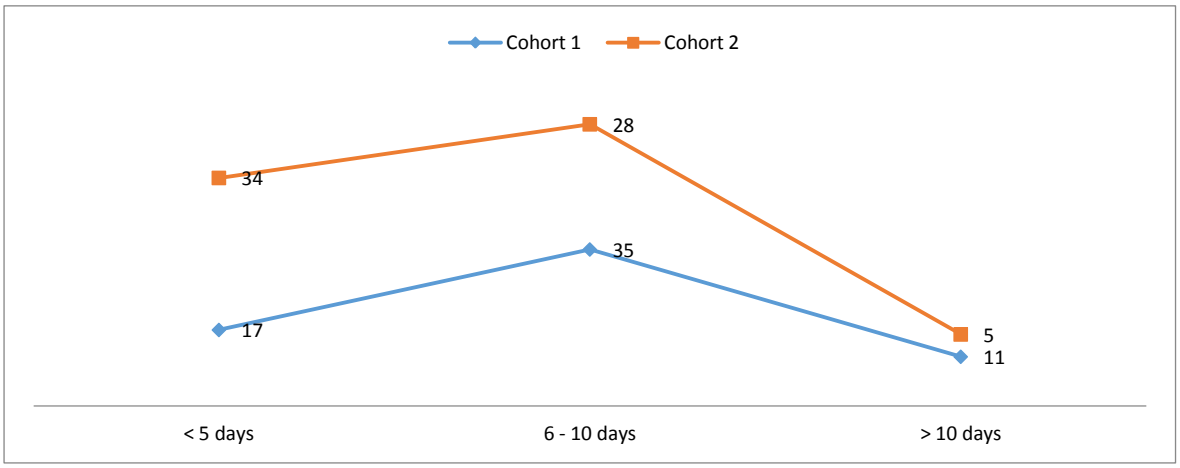
Feature	Cohort 1(2013-14)	Cohort 2(2015-16)
Total no. of patients	63	67
Male / Female	**27** % vs 73 %;	**39** % vs 61
Rural vs Urban	81.5% vs18.5%	66% vs 34%

Figure - 1: Clinical presentation.



H.A-Headache
A.S-Altered sensorium

Figure - 2: Symptom onset to diagnosis.



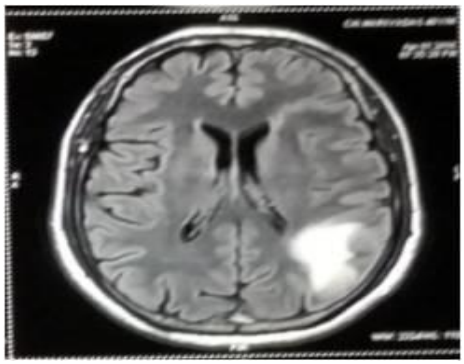
Discussion

CVST is reported to be more common in developing countries, and has been linked to pregnancy, multi-parity, dehydration, and infection. Developments in imaging, diagnostic laboratory investigations, and genetics have provided valuable information about risk factors and clinical spectrum of CVST.

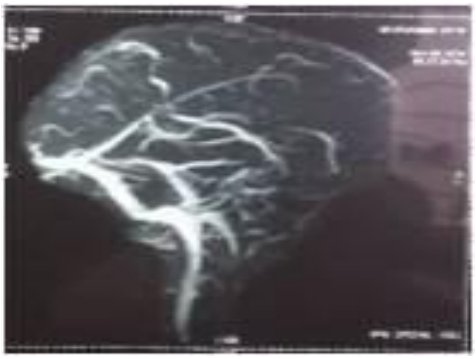
Comparative studies showed similar findings in terms of clinical presentation. Pfefferkorn, et al. [4] studied 32 patients with CVST with headache (81%) being common presenting symptom

however, there have been significant changes in the epidemiological as well as etiological profiles of our patients over a period of 2 years. Comparable to some studies while discordant with some other, infections are particularly on the rise in our study. Comparable to Virendra C patil, et al. [5] study where Infection, dehydration and peripartum state were the important precipitating or risk factors, either individually or in combination for development of CVST. Hematologic disorders and cerebral venous thrombosis studied by Akhtar N, et al. [6]. Previous studies explained the commonest cause of sinus thrombosis in south Indian women by Nagaraja D, et al. [7] and Kruthika-Viond TP, et al. [8] and the prothrombin gene G20210A variant and puerperal cerebral venous. The treatment of cerebral sinus/ venous thrombosis as shown in the previous studies Nagaraja D, et al. [7] and Sarma GR, et al [9].

Figure - 3: Imaging study in patients.

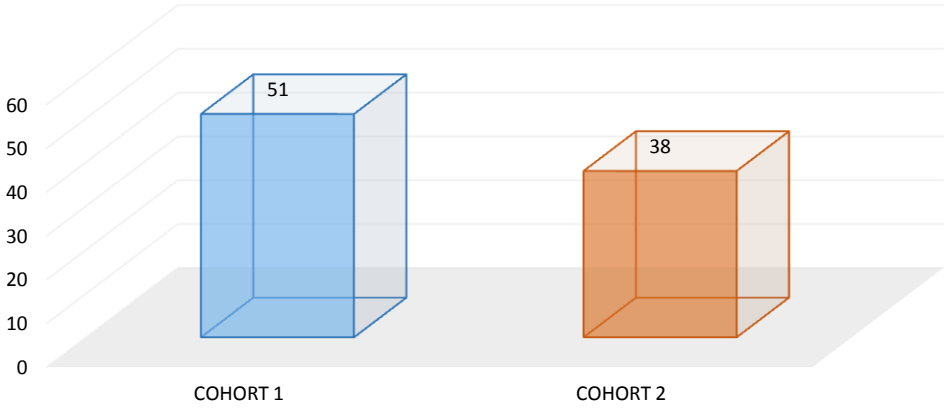


MRI brain parenchymal changes



MR venogram

Figure - 4: MRI Brain parenchymal changes.



According to the largest cohort study, 78% cases occurred in patients younger than 50 years. One pathological study found a prevalence of CVT of 9.3% among 182 consecutive autopsies. No population studies have reported the incidence of CVT. Hyperhomocysteinemia is a risk factor for DVT and stroke but has not been clearly associated with an increased risk of CVT [1]. Lath, et al. [10] stated that the mortality in CVST, in addition to progressive thrombosis, is related to elevated intracranial pressure causing transtentorial herniation. They reported a mortality of 27%. Lath, et al. reported that the decompressive surgery for patients with large cerebral venous infarcts is a life-saving procedure. Pfefferkorn, et al. [4] studied 32 patients with CVST with headache (81%) being common presenting symptom. Out of 32 patients, 9 (28%) had deep cerebral venous system thrombosis (DCVST) and 23 (72%) had non-

isolated DCVST. Similarly, in our study cohort 1 - 63 (100%) and cohort 2 - 67 (100%) patients presented with symptoms of headache with deep venous system thrombosis. Azin, et al. [11] studied 61 patients with CVST where male-to-female ratio was 1/3.1. The mean age of patients was 35.6 ± 12.1 years. Headache was seen in 91.8% of the patients. The most frequent risk factor was oral contraceptive consumption (62.2%). Involvement of superior sagittal sinus and lateral sinus was 80.3% and 41%, respectively. The fatality rate was 14.7%. Similarly, headache in patients was the most common presenting feature in our study.

Figure - 5: Causes of CSVT in both the cohort groups.

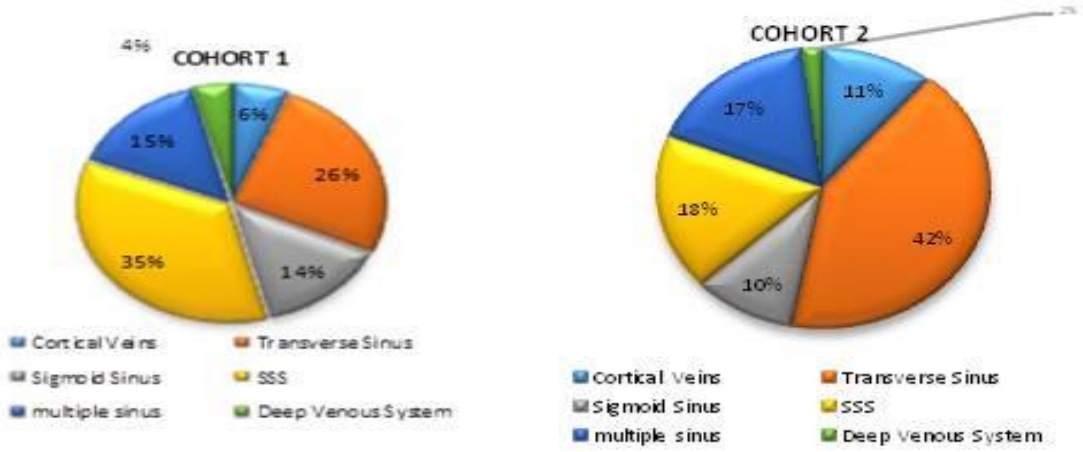
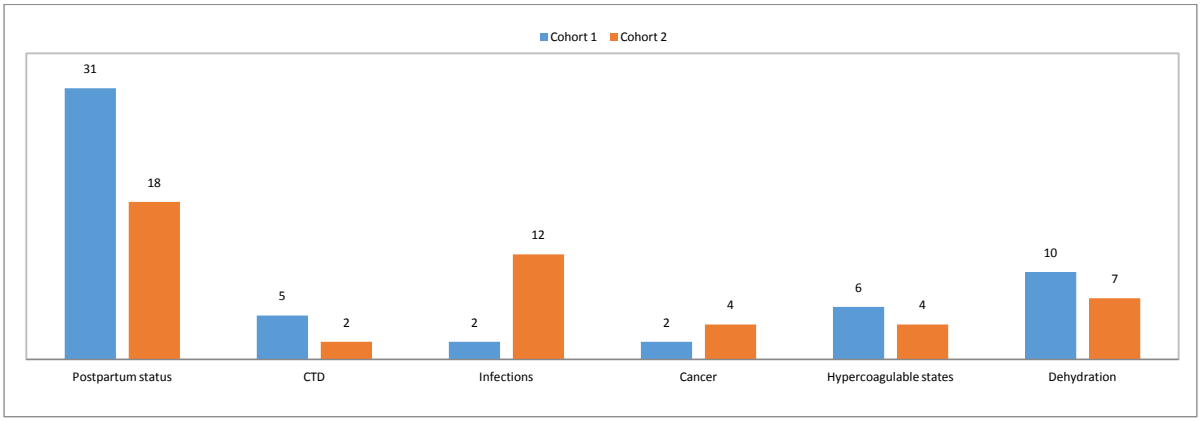


Figure - 6: Risk factors associated in the cohorts.



Prakash, et al. [12] reported that the most common involvement in CVST was superior sagittal sinus (72%), similarly in our study most of the patients had cortical vein thrombosis. Khealani, et al. [7] stated that the obstetric CSVT has a different course and carries favorable prognosis as compared with CVT unrelated to pregnancy.

Nagaraja, et al. [1] reported that strokes in the young account for nearly 30% of all cases of stroke in India and CVT accounts for 10%-20% of these cases. Two-thirds of them develop the same in the postpartum period. Similarly, in our study about one third of female population had CVST in peripartum period. Nagarajan, et al. [13] studied total 25 patients with CVST with mean age 35.7 years with a male-to-female ratio of 13:12. Headache (84%) and convulsions (47%) were the most common clinical features. Focal neurological deficits were observed in 60% of the patients and hemiparesis was the common deficit (28%). Infection was present in 28% cases. Superior sagittal sinus was the most frequent sinus involved. Similarly, in our study .Similar findings were reported by Appenzeller,

et al. [2] in their study of 24 patients (18 women, 6 men) with mean age of 29.5 years with headache (75%) and vomiting (33%); pregnancy or puerperium in six (25%), and inherited thrombotic risk factors in four (17%) patients. Pai, et al. [14] studied 612 (354 men, 219 women, and 39 children) patients with CVT with papilledema (62%), headache (62%), hemiparesis (48%), seizures (31%), and cranial nerve palsy (7%). Superior sagittal sinus thrombosis was the most common site (74%) associated with dehydration, sepsis, pregnancy, and puerperium, Death due to CVT was 13%. These findings are comparable with our study. Haghighi, et al. [15] studied 465 patients in the age group 29.5-43.8 years with ratio of female to male being 2.79. Headache (80%-97%), sensory/motor deficits (39%-64%), and seizure (20%-62%) were the most common clinical presentations with mortality rate of 11.4%. Mehndiratta, et al. [16] reported that headache (80%) is the most frequent symptom in patients with CVT with 75% being female population. The mean age among females was 27.75 years and among males was 41.5 years. Of the 4 females, 2 were postpartum. Of 2 males, 1 had hyperhomocysteinemia and one had hyperlipidemia.

Nagaraja, et al. [1] stated that the pregnancy and puerperium increase the risk of thrombotic events, and these risks are likely to be increased in women who are carriers of thrombophilic gene polymorphisms. Prothrombin G20210A variant is reported to be the second most frequent prothrombotic polymorphism in Whites. Kalita, et al. [17] reported that the CVST more often occurs during pregnancy, multiparity, and infection. In their study of 33 patients with CVST, mean age 37.5 years (range 16-76); 23 were female with superior sagittal sinus in 23, the lateral sinus in 19, straight sinus in 3, inferior sagittal sinus in 1, and deep venous system in 1. Seventeen patients had multiple sinus involvements. Predisposing factors could be identified in 16 patients, and included pregnancy and puerperium in 6, infection in 6, oral contraceptive in 2, and dehydration in 1 each. Most CVST studies from India are of puerperal. These findings are comparable with our results. Koopman, et al. [18] stated that CVST was more frequently associated with oral contraceptive use, pregnancy, or puerperium. CVT was relatively more common in women and hormonal factors may predispose to CVT. Coutinho, et al. [19] in their study of 624 patients, 75% were women with significantly younger, with better outcome compared with male patients with CVST. These findings are comparable with our study in which death was relatively more in male than female.

Conclusion

A high index of suspicion is of paramount importance in relevant clinical situations. Our study emphasizes the need for judicious usage of laboratory tests such that evaluation in cases of CVT is effective and economical. Especially regard to clarification of its management. Our study emphasizes the need for judicious usage of laboratory tests such that evaluation in cases of CSVT is effective and economical.

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