

A Prospective Study of Cerebral Sino-Venous Thrombosis in Males - An Under Recognized Disease

Khichar Purnaram Shubhakaran^{1*}, Amita Bhargava², Ankit Shah³, Kirti Sachdeva⁴ and Arvind Lakesar⁴

¹Professor Neurology, Dr. S. N. Medical College, Jodhpur, India

²Senior Professor and HOD Neurology, Dr. S. N. Medical College, Jodhpur, India

³Consultant Neurology, Dr. S. N. Medical College, Jodhpur, India

⁴Resident Neurology, Dr. S. N. Medical College, Jodhpur, India

*Corresponding Author: Khichar Purnaram Shubhakaran, Professor Neurology, Dr. S. N. Medical College, Jodhpur, India.

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Abstract

Introduction: Cerebral Sino-Venous Thrombosis (CSVT), is an uncommon cause of cerebral infarction relative to arterial disease, but is an important consideration because of its morbidity and reversibility with timely diagnosis and treatment. Male have different clinical picture and more importantly the etiology and prognosis. There are very few studies that meant only for male patients of CSVT. The current study is undertaken to analyse CSVT in male patients- the pattern and incidence of the clinical symptoms and signs, etiological spectrum and, radiological findings and their correlation.

Material and Methods: In a hospital based prospective observational study at a tertiary level health (medical college hospital) care station, hospitalized from January 2013 to January 2016 with the final diagnosis of CSVT were included. All patients were treated conservatively with oral anticoagulation therapy and followed up appropriately. Four patients (10%) were lost to follow-up. The data recorded during follow-up, included disability according to modified Rankin Scale (mRS), seizures, visual loss, the ongoing treatment, recurrence of symptomatic sinus thrombosis, and death.

Results: The mean age was 31.3 years (range 15 - 78 years). The presentation was sub-acute (60%), followed by chronic (25%) and acute (15%). Idiopathic intracranial hypertension (IIH) like presentation was the most common one i.e. in 20 (50%), followed by isolated seizures in 10 (25%), stroke like presentation in 8 (20%) and, encephalopathy in 2 (5%) patients. Sinus involved were SSS in 33 (62.5%), left transverse in 13 (32.5%), right transverse in 11 (27.5%), deep sinuses in 4 (10%) of the patients. Common risk factors were hyper-homocysteinemia in 7 (17.5%), alcoholism in 7 (17.5%), polycythemia 2 (5%), trauma 2 (5%), dehydration 2 (5%) and protein S deficiency in 1 (2.5%) patients.

Conclusion: In Male patients of CSVT, headache (90%), vomiting (85%) and, papilloedema (77.5%) are common symptoms and signs. Common clinical presentations are IIH like (50%), isolated seizures (25%). hyper-homocysteinemia and alcoholism were the most common risk factors in male patients of CSVT. Overall prognosis was good.

Keywords: Cerebral Sino-Venous Thrombosis; Stroke; Male

Abbreviations

CSVT: Cerebral Sino-Venous Thrombosis; mRS: Modified Rankin Scale; INR: International Normalized Ratio; LFT: Liver Function Tests; RFT: Renal Function Tests; ECG: Electrocardiogram; CT: Computerized Tomography; MRI: Magnetic Resonance Imaging; ANA: Anti-Nuclear Antibodies; SSS: Superior Sagittal Sinus; SLE: Systemic Lupus Erythematosus; APLA: Antiphospholipid Antibody

Introduction

Cerebral Sino-Venous Thrombosis (CSVT), is an uncommon cause of cerebral infarction [1] relative to arterial disease, but is an important consideration because of its morbidity and reversibility with timely diagnosis and treatment. With the widespread use of neuroimaging and hematological workup, many of the previously held concepts about CSVT are changing [2]. In males CSVT have different clinical picture and more importantly the etiology and prognosis. In spite of the fact that first case report in literature is of a male patient, there are very few studies that meant only for male patients of CSVT [3]. Till 2015 there is no population based study from India, but are the hospital based, so the real incidence of CSVT in India is still not known [1]. The current study is undertaken to analyse CSVT in male patients- the pattern and incidence of the clinical symptoms and signs, etiological spectrum and, radiological findings and their correlation.

Aim of the Study

To study clinical profile, etiological spectrum and outcome of CSVT in males.

Material and Methods

This study was conducted as a hospital based prospective observational study at a tertiary level health care station (medical college teaching hospital). Total 40 patients hospitalized from January 2013 to January 2016 with the final diagnosis of CSVT were involved. Investigations done in all patients included- complete blood count, peripheral blood smear examination, liver function tests (LFT), renal function tests (RFT), electrocardiogram (ECG), computerized tomography (CT)/magnetic resonance imaging(MRI) of brain, CT venogram/MR venogram, coagulation profile, anti- nuclear antibodies (ANA), serum homocysteine, and in selected cases - JAK 2 STAT mutation, HLA B 51.

All the patients suspected to have CSVT were subjected to thorough clinical evaluation. The clinical diagnosis was confirmed by at least one of the radiological investigations i.e. MR venogram/CT venogram.

All patients were treated conservatively with low molecular heparin initially followed by oral anticoagulation therapy i.e. warfarin or acenocoumarol with a target international normalized ratio (INR) of 2 - 3 for a minimum period of 6 months [1]. Follow-up visits were performed every monthly for first 6 months, and every 6 months thereafter by direct interview. Minimum of 6 months follow-up was available in 90% patients. 4 patients (10%) were lost to follow-up.

The data recorded during follow-up, included disability according to modified Rankin Scale (mRS), seizures, visual impairment, the ongoing treatment, recurrence of symptomatic sinus thrombosis, and death.

Results

Of the 40 males, the mean age was 31.3 years (range 15 - 78 years).

Most common presentation was sub-acute (60%), followed by chronic (25%) and acute (15%).

Feature	Percentage of patients
Headache	90%
Vomiting	85%
Seizure	35%
Hemiparesis	20%
Altered sensorium	25%
Papilloedema	77.5%
Cranial Nerve palsy	15%

Table 1: Clinical features.

In terms of clinical syndromes, idiopathic intracranial hypertension like presentation was the most common one i.e. in 20 (50%), followed by isolated seizures in 10 (25%), stroke like presentation in 8 (20%) and, encephalopathy in 2 (5%) patients.

On imaging, CT Head was normal in 50%, MRI brain was abnormal in all patients including brain parenchymal lesions in 18 (45%) patients, indirect signs of CSVT etc. Sinus involved were SSS in 33 (62.5%), left transverse in 13 (32.5%), right transverse in 11 (27.5%), deep sinuses in 4 (10%) of the patients.

Common risk factors were hyper-homocysteinemia in 7 (17.5%), alcoholism in 7 (17.5%), polycythemia 2 (5%), trauma 2 (5%), dehydration 2 (5%) and protein S deficiency in 1 (2.5%) patients.

	No. of patients	% of patients
Hyperhomocysteinemia	10	25%
Alcoholism	10	25%
Dehydration	5	12.5%
CSOM	3	7.5%
Trauma	2	5%
Protein C def.	2	5%
Polycythemia	2	5%
Factor V leiden mutation	1	2.5%
Malignancy-NHL	1	2.5%
Behcet's disease	1	2.5%
High Altitude	1	2.5%
Unknown	10	25%

Table 2: Probable precipitating factors.

**Many have more than one factor responsible.*

NHL: Non-Hodgkin's Lymphoma; CSOM: Chronic Suppurative Otitis Media.

MRS	Baseline		3 months	6 months
	Total patients	Pts in which follow-up available		
=< 2	32 (80%)	30 (75%)	33 (82.5%)	35 (87.5%)
> 2	8 (20%)	6 (15%)	3 (7.5%)	1 (2.5%)

Table 3: Follow-up details.

In-house mortality was noted in 1 (2.5%) and recurrence in 1 (2.5%) patient.

Discussion

Previous studies from India have shown CSVT to be highly prevalent and generally associated with postpartum state [4-6]. Most of these studies were done before the widespread use of modern neuroimaging [6-9] and had limitations of having small numbers and incomplete investigations [6,7,9]. Previous studies found 60 - 79% of CSVT patients to be women [6,10] and reported it as the commonest cause of stroke in young women in India [11]. The main reason for this was believed to be high prevalence of peri-partum hyper-coagulable state, precipitated by dehydration and consumption of high fat food in the developing countries during peri-partum period [10].

In our study of 40 males, the mean age was 31.3 years (range 15 - 78 years) which is lowest of the mean age (31.3 - 48.7%) reported from India [1] but is similar to a large series reported from Nizam's Institute Venous Stroke Registry (NIVSR) [2]. One reason up to some extent for it may be the exclusion of females and paediatric patients. Most common presenting features in the present study were headache (90%), vomiting (85%), and seizures (25%) as was shown in the previous studies [12-15]. Papilledema (77.5%) was the most frequent sign like the previous studies. We encountered four distinct clinical syndromes, i.e. idiopathic intracranial hypertension (IIH) like presentation, seizures, stroke like presentation and, encephalopathy, in our study comprising 40 (50%), 10 (25%), 8 (20%) and 2 (5%) patients which is quite different pattern from other studies [2].

The diagnosis of CSVT in the present study was based upon the classical angiographic abnormalities [16,17], particularly the partial or complete lack of filling of at least one sinus, which was the prerequisite for inclusion in the study, although a lack of filling does not invariably indicate a sinus occlusion [17]. In present study, plain CT head was abnormal only in 50% (as hemorrhagic infarcts, cord signs etc.) and plain MRI was found abnormal in all patients (as infarcts, absence of flow voids etc.) So we cannot depend only on plain CT head for CSVT if we strongly suspect or want to rule out CSVT but MRI brain is fairly a good tool as it was observed in present study. Sinus involved were SSS in 33 (62.5%), left transverse in 13 (32.5%) right transverse in 11 (27.5%), deep sinuses in 4 (10%) of the patients. SSS is most common sinus involved in our study as it was found in other studies as well [18].

All patients were treated conservatively with oral anticoagulation therapy with a target International Normalized Ratio (INR) of 2 - 3 [1,19] for a minimum period of 6 months. Other specific and supportive treatment was done as per clinical status and for specific diseases like for antiphospholipid antibody (APLA), systemic lupus erythematosus (SLE), Behcet's disease, polycythemia etc.

Six month follow-up was available in 90% patients. Out of 15% patients having baseline MRS > 2; only 2.5% patients having > 2 MRS at 6 months. With treatment more than 85% patients had MRS < 2 at 6 months in contrast to arterial stroke [19] where more patients remain dependent and bed bound. Also mortality and recurrence was low (1 patient each).

Conclusion

In Male patients of CSVT, headache (90%), vomiting (85%) and, papilloedema (77.5%) are common symptoms and signs. Common clinical presentations are IIH like (50%), isolated seizures (25%). Hyper-homocysteinemia and alcoholism were the most common risk factors in male patients of CSVT. Overall prognosis was good. The message of the study is that male CSVT is not rare but under recognized disease entity which requires more prospective studies or retrospective data analysis from different regions to understand it well further more.

Bibliography

1. Dash D., *et al.* "Cerebral venous thrombosis: An Indian perspective". *Neurology India* 63.3 (2015): 318-328.
2. Narayan D., *et al.* "Risk factors, clinical profile, and long-term outcome of 428 patients of cerebral sinus venous thrombosis: Insights from Nizam's Institute Venous Stroke Registry, Hyderabad (India)". *Neurology India* 60.2 (2012): 154-159.
3. M Ribes. "Des recherches faites sur la phlebite". *Revue Medicale Francaise et Etrangere et Journal de Clinique de L'Hotel-Dieu et de la Charite de Paris* 3 (1825): 5-41.
4. Srinivasan K and Natarajan M. "Cerebral venous and arterial thrombosis in pregnancy and puerperium". *Neurology India* 22.3 (1974): 131-140.
5. Srinivasan K and Natarajan M. "Cerebral venous and sinus thrombosis in pregnancy and puerperium. A study of 135 patients". *Angiology* 34.11 (1983): 731-746.
6. Nagaraja D and Taly AB. "Cerebral venous thrombosis". *Journal of the Association of Physicians of India* 35 (1987): 876.
7. Lath R., *et al.* "Decompressive surgery for severe cerebral venous sinus thrombosis". *Neurology India* 58.3 (2010): 392-397.
8. Nagaraja D and Sarma GR. "Treatment of cerebral sinus/venous thrombosis". *Neurology India* 50.2 (2002): 114-116.
9. Kalita J., *et al.* "Cerebral venous sinus thrombosis in a tertiary care setting in India". *QJM: An International Journal of Medicine* 99.7 (2006): 491-492.
10. Chopra JS and Banerjee AK. "Primary intracranial sinovenous occlusions in youth and pregnancy". In: Toole JF, editor. *Handbook of clinical neurology, vascular disease part II. Volume 54 North Holland: Elsevier* (1989): 425-452.
11. Bansal BC., *et al.* "Stroke during pregnancy and puerperium in young females below the age of 40 years as a result of cerebral venous/sinus thrombosis". *Japanese Heart Journal* 21.2 (1980): 171-183.
12. Ferro JM., *et al.* "Prognosis of cerebral venous and dural sinus thrombosis, Results of ISCVT". *Stroke* 35.3 (2004): 664-670.
13. de Bruijin SF., *et al.* "Clinical features and prognostic factors of cerebral venous sinus thrombosis in a prospective series of 59 patients". *Journal of Neurology, Neurosurgery, and Psychiatry* 70.1 (2001): 105-108.
14. Preter M., *et al.* "Long term prognosis in cerebral venous thrombosis: A follow up of 77 patients". *Stroke* 27.2 (1996): 243-246.
15. EinHaupt KM., *et al.* "Heparin treatment in sinus venous thrombosis". *Lancet* 338.8767 (1991): 597-600.
16. Askenasy HM., *et al.* "Thrombosis of the longitudinal sinus. Diagnosis by carotid angiography". *Neurology* 12 (1962): 288-292.
17. Vines FS and Davis DO. "Clinical radiological correlation in cerebral venous occlusive disease". *Radiology* 98.1 (1971): 9-22.
18. Schell C L and Rathe RJ. "Superior sagittal sinus thrombosis. Still a killer". *The Western Journal of Medicine* 149.3 (1988): 304-307.
19. Alvis-Miranda., *et al.* "Cerebral sinus venous thrombosis". *Journal of Neurosciences in Rural Practice* 4.4 (2013): 427-438.

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