

Cerebral Venous Thrombosis in Women: A Study from Teaching Hospital in North Karnataka

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Abstract

Background: Cerebral venous thrombosis (CVT) is a relatively rare subtype of stroke. In young to middle aged adults, it is much more common in women than in men. Because of its diverse presentation and unpredictable clinical outcome, it remains a diagnostic challenge for treating clinicians. CVT is more common in underdeveloped countries and is one of the most common causes of stroke in young in India. Though several studies were done in India and elsewhere on CVT, it has not been extensively studied of late.

Objective: The objective of the study is to study the clinical profile of CVT in women.

Materials and Methods: A total of 50 consecutive patients admitted in medicine and obstetrics and gynecology ward between April 2012 and March 2014 with radiologically confirmed diagnosis of CVT were included in the study. Detailed history, clinical examination, and laboratory investigations were carried out in all the cases.

Results: Out of 50 patients of CVT studied, the age of patients varied from 18 to 50 years. Maximum incidence was seen in 21-30 age group comprising 54% of the cases, with mean age being 29.52 years. Two-third of the patients belongs to the low socio-economic class. The majority of them had subacute presentation with the headache in 74%, followed by altered sensorium (54%) and convulsions (46%) being the most common presenting symptoms. Radiologically the most common finding noted was hemorrhagic infarction (56%), followed by non-hemorrhagic infarction (44%). The most common risk factors identified were postpartum followed by dehydration and infections. Mortality was 4% in the present study.

Conclusion: Cerebral venous sinus thrombosis is a challenging condition because of its variability of clinical symptoms and signs. A high index of clinical suspicion is needed to diagnose CVT. Pregnancy and puerperium are most prevalent prothrombotic states leading to CVT.

Key words: Cerebral venous thrombosis, Puerperium, Young

INTRODUCTION

Thrombosis of the cerebral veins and sinuses is a distinct cerebrovascular disorder that unlike an arterial stroke, most often affects young adults and children.¹ Cerebral venous thrombosis (CVT) is an underdiagnosed condition and less frequent than arterial thrombosis.^{2,3} In young to middle aged adults, CVT is much more common in women than men with a ratio of approximately of 3:1.³ Cerebral venous

sinus thrombosis (CVST) is an uncommon condition, which over the past 10 years has been diagnosed the more frequent due to greater awareness and the availability of better non-invasive diagnostic techniques. Because of the generally good prognosis and variable clinical signs, many cases remain clinically undetected but some patients suffer complications and die.^{4,5} Little is known about the differences between men and women regarding clinical manifestations and outcome of CVT.³ The purpose of the present study is to describe the clinical features, etiologies, treatment and prognosis of CVT in women.

MATERIALS AND METHODS

Total 50 consecutive patients admitted in medicine and obstetrics and gynecology ward between April 2012 and

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March 2014 with radiologically confirmed diagnosis of CVT were included into the study. Detailed history, clinical examination, and laboratory investigations mentioned below were carried out in all the cases and followed until discharge from the hospital or death. The results were analyzed, and descriptive statistics were used.

Exclusion Criteria

1. Computed tomogram (CT) scan inconclusive of CVT
2. Hypertensive hemorrhage
3. Arterial stroke
4. Metabolic encephalopathies
5. Space occupying lesions.

Data were collected by using proforma meeting the objectives of the study. The purpose of the study was carefully explained to the patients and informed consent was taken.

Investigations

Complete hemogram, blood urea, serum creatinine, serum electrolytes such as sodium, potassium and chloride, urine routine, electrocardiography, chest X-ray, ocular fundoscopy, cerebrospinal fluid analysis and computed tomography scan/magnetic resonance imaging + magnetic resonance venogram were done. In relevant cases specifically indicated coagulation prolife, serum homocysteine levels, anti-nuclear antibody, rheumatoid factor, and antiphospholipid, antibodies were done.

Statistical Methods

The results were analyzed by calculating percentages, and the mean values.

Statistical Software

The statistical software namely SPSS 15.0, STATA 8.0, MEDCALC 9.0.1, and SYSTAT 11.0 were used for the analysis of the data and Microsoft word and excel have been used to generate the tables.

RESULTS

Demographics and baseline characteristics of the patients are depicted in Table 1. Out of 50 patients of CVT studied, the age of patients varied from 18 to 50 years. Maximum incidence was seen in 21-30 age group comprising 54% of the cases, with the mean age being 29.52 years. The majority of the patients were illiterates (64%) and the most of them are from the low socio-economic state (64%).

Mode of onset in the present study was classified into acute onset - those presented within 24 h, subacute onset - those presented after 48 h but <30 days and chronic onset - onset more than 30 days (Bousser *et al.*, 1985). The majority of

Table 1: Baseline characteristics of the patients

Characteristics	Number of patients (%)
Demographics	
Mean age	29.52
Literacy status	
Literate	18 (36)
Illiterate	32 (64)
Socio-economic status	32 (64)
Low	
Middle	13 (26)
High	5 (10)
Clinical manifestations	
Mode of onset	
Acute	14 (28)
Subacute	34 (68)
Chronic	2 (4)
Symptoms	
Headache	37 (74)
Seizures	23 (46)
Altered sensorium	27 (54)
Vomiting	18 (36)
Focal deficits	16 (32)
Fever	14 (28)
Papilloedema	12 (24)
Level of conscious	23 (46)
Fully conscious	
Drowsy	13 (26)
Stuporous	10 (20)
Comatose	4 (8)
Neuroimaging findings	
Hemorrhagic infract	28 (56)
Non-hemorrhagic infract	22 (44)

the patients had subacute presentation (68%) with the headache in 74% followed by altered sensorium (54%) and convulsions (46%) being the most common presenting symptoms. All the cases in the present study showed varying degree of consciousness. Among them, 46% were found conscious at the time of admission. 26% were found drowsy followed by stuporous (20%) and comatose (8%).

The most common neuroimaging finding noted was hemorrhagic infraction (56%), followed by non-hemorrhagic infraction (44%). Superior sagittal sinus was the most common sinus to be involved in the present study accounting for 76%, followed by transverse sinus (38%) and sigmoid sinus (34%).

Out of the 50 patients, puerperal CVT was the most common (Table 2), seen in 32 patients (54%). The second most common was dehydration (7 patients, 14%), followed by infective CVT (4 patients (8%) - sinusitis (1), Chronic suppurative otitis media + myringitis (2), meningitis (1), Oral contraceptive pills induced (2 patients, 4%), hyperhomocysteinemia (1 patients, 2%) and no cause was found in 4 patients (8%).

Nearly 96% patients received heparin in a therapeutic dose and all of them had complete recovery.

Table 2: Etiology, treatment and outcome of the patients

Causes	Number of patients (%)
Etiology	
Puerperal	32 (64)
Dehydration	7 (14)
Infection	4 (8)
Oral contraceptive pills	2 (4)
Hyperhomocysteinemia	1 (2)
No risk factors identified	4 (8)
Treatment	
Heparin - unfractioned	21 (42)
Low molecular weight heparin	27 (56)
Decompression	2 (4)
Outcome	
Complete recovery	48 (96)
Death	2 (4)

DISCUSSION

CVT is an underdiagnosed condition for acute or slowly progressive neurological deficit. CVT has a wide spectrum of signs and symptoms, which may evolve suddenly or over the weeks.⁶ Over the past 5-10 years, it has been diagnosed more frequently due to greater awareness and the availability of better non-invasive diagnostic techniques. Because of the generally good prognosis and variable clinical signs, many cases remain clinically undetected.⁴ CVT is slightly more common in women, particularly in the age group 20-35, due to pregnancy, puerperium, and oral contraceptive use.⁵ Though several studies were done in India and elsewhere on CVT, it has not been extensively studied of late. 50 consecutive cases with a radiologically confirmed diagnosis of CVT were included into the study. The observations are compared with the studies done by others on the same subject.

In our study of 50 patients, maximum numbers of cases (54%) were seen in the age group of 21-40 years. This correlates well with a similar study by Ameri and Bousser⁷ (61%). Mean age of onset in the present study was 29.5 years which is comparable with Daif *et al.*⁸ study (27.8 years).

Majority of the patients in the present study were illiterates (64%). This may be due to unhygienic health practices like home delivery, local traditional practice of water restriction in the peripartum period, etc. more common among illiterates. Aaron *et al.*⁹ in their study suggested possible role of fluid restriction practice in the causation of CVT and also they noticed that although, this traditional practice is followed even in the hot summer months, there was no increase in the incidence of CVT in the summer months.

Majority of the patients in the present study were in low socio-economic group. This is because the hospital where the study was conducted provides services to the socio-economic deprived persons. Prakash and Bansal¹⁰ in their study mention that reasons for its frequent occurrence in socio-economically backward persons especially of Indian origin need to be researched.

Headache (74%) was the most common symptom noted. Apart from headache, altered sensorium (54%) followed by convulsions (46%). This is comparable to a similar study done by Kumar *et al.*¹¹ (headache - 66%, seizures - 67%).

In the present study, CVT was commonly seen in peripartum period (64%). The experience of other authors from India had been similar like Neki¹² had found 62% of cases of CVT in postpartum period but Nagaraja *et al.*¹³ had found that 200 out of 230 cases (86%) of CVT, seen over eight years, were puerperal in nature.

The most common neuroimaging finding was hemorrhagic infraction (56%), followed by non-hemorrhagic infraction (44%). Nagaraja *et al.*¹³ noted hemorrhagic infraction in 40.9% and non-hemorrhagic infraction in 51.6%. Dixit *et al.* study reported hemorrhagic infraction in 48.4% and non-hemorrhagic infraction in 32.3%.

CONCLUSION

CVST can affect all age groups, particularly women of childbearing age. Overall prognosis for survival and functional independence is better than it was believed. Patients with CVT related to pregnancy and puerperium generally do better than patients with other causes.

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