

A Study of the Clinical Profile of Cerebral Venous Sinus Thrombosis

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Abstract: Background and objectives: CVT is an important cause of a stroke. Its varied presentations make the clinician to have strong degree of suspicion and investigate accordingly thus instituting early treatment.

Objectives: To study clinical profile of cortical venous sinus thrombosis and to assess if possible any prognostic factors.

Methods: Total 30 patients diagnosed as CVT by CT scan/MR angio (Direct and indirect findings of CVT) above 18 years studied. Patients with less than 18 years and stroke of arterial origin were excluded.

Results: The male to female ratio was 1:5, and total of 23 patients were alive with age group of 21-35 being maximally involved. Puerperium formed the bulk (18 patients) in female patients and of which 10 were from headache (94%), convulsions (78%) were predominant symptoms. Lateralising signs like hemiplegia (34%), were seen. Papilledema was an important sign present in 50% of patients. Superior sagittal sinus thrombosis (40%) was the most common sinus to be involved with early diagnosis and treatment 68% patients were discharged without deficits rest had some deficits.

Interpretation and Conclusion:

- 1) Puerperium formed the bulk of cause of CVT in female patients.
- 2) Headache convulsions, neurological defects and papilledema formed the important quadrant of presentation of CVT.
- 3) Superior sagittal sinus was the commonest involved.
- 4) With adequate treatment many had good recovery.

Key words: Cerebral venous thrombosis; puerperium; anticoagulation.

I. Introduction

Cerebral venous sinus thrombosis is an important cause of stroke specially in peripartum setting and stroke in young.

The earliest reference to CVT appeared in 1825 in the French literature with postmortem confirmation in a 45 years old man with headache. Seizure, confusions wide spread malignancy.

Earlier considered to be a rare entity; over the past 30 years the outlook for CVT has been dramatically improved, by the advent of sensitive neuro imaging technique, and increasing awareness of variety of presentations and effective treatment for the same has helped its cause

OBJECTIVES

To study the clinical profile of cerebral venous sinus thrombosis and to assess if possible any prognostic factors

II. Methodology

1) Source of Data:

Patients admitted in Chigateri General Hospital and Bapuji Hospital attached to J.J.M Medical College, Davangere.

A total of thirty patients admitted in hospital during the study period who had clinical and CT/MR angio, features (direct and indirect) suggestive of cerebral sinus venous thrombosis were selected

Inclusion criteria:

- All patients aged > 18 years.
- An acute or sub acute neurological illness in a patient under appropriate clinical condition whose CT features (direct and indirect signs) /MR angio where ever done suggestive of cerebral venous sinus thrombosis.
- The examination should have suggested constellation of signs of raised ICT /Neurological deficits / seizures.

Exclusion criteria:

- Patients <18 years
 - Stroke due to arterial thrombosis, haemorrhage and patients with ICSOL.
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All the patients selected were subjected to detailed history, clinical examination and investigated.

- 1) Complete blood picture
- 2) Blood sugar, blood urea serum creatinine
- 3) CSF Analysis (wherever deemed necessary)
- 4) Serology for HIV – 1 &2
- 5) Urine culture and sensitivity.

HISTORY AND EXAMINATION:

All patients selected were asked a detailed history with emphasis to find out common etiologies for CVT. In patients of puerperium further detailed assessment of the parity, antenatal illness, post natal sepsis, fever, dehydration were enquired.

A general physical examination and a detailed neurological assessment with other systems were done to look for any evidence of etiologies.

III. Results

TABLE 1: TOTAL MORTALITY

Total patients of CVT	Alive	Dead
30	23	07

In this study of 30 patients 23 were alive and 7 patients died.

TABLE 2: AGE DISTRIBUTION

Age(year)	Number of patients	percentage
18-20 Y	5	17%
21-35 Y	15	49%
>35 Y	10	34%

The maximum number of patients was in the age group of 21-35, the youngest was 18 years old

The clustering of patients in these age groups probably was the result of puerperium as one of the commonest prothrombotic state associated with CVT

TABLE 3: SEX RATIO

Total	Male	Female
30	5	25

In our study the ratio was 1:5

TABLE 4: NUMBER OF PATIENTS WITH PUERPERIUM AS A MAJOR CAUSE AND THEIR PARITY

Total Number	Puerperium	Alive	Dead
30	TOTAL 18(Primi 10)	16	2

Thus puerperium formed the bulk of causes of CVT and here 60% of the cases were primi. Two patients had not attended antenatal checkup.

TABLE 5: INITIAL SYMPTOMS

Symptoms	No	Percentage
Headache	28	94%
Convulsions	21	70%
Altered sensorium	20	68%

Focal deficits	13	43%
Fever	10	33%

Thus headache was the universal presenting symptom followed by convulsions, focal deficits altered sensorium and fever.

IV. Examination Findings:

Neurological Examination:

TABLE 6: LEVEL OF CONSCIOUSNESS AT TIME OF PRESENTATION

Level of consciousness	Total	Alive	Dead
Fully conscious	8	8	-
Drowsy	15	13	3
Unconscious with purposive movements	4	2	2
Deeply comatose	3	-	3

Thus mortality was high in patients who presented with deep coma.

TABLE 7: FOCAL DEFICITS/NEUROLOGICAL SIGNS

Signs	Total	%
Hemiplegia	11	34
Aphasia	07	22
Papilledema	18	60

Thus lateralising signs like hemiparesis was seen in 34% of case and papilledema was the most prominent sign. Aphasia was also a common finding and one patient had Wernicke's aphasia. Majority of patients had nominal aphasia especially during recovery.

INVESTIGATIONS:

TABLE 8: HAEMOGLOBIN PERCENTAGE

Hb%	Number of patients	Patients alive	Dead
<5	-	-	-
5-8	09	07	02
8.1-10	04	02	02
>10	17	14	03

Of the total, of 25 patients were anemic though the total number of deaths appears to be more with Hb>10 gm%, the percentage of mortality was higher when there was moderate to severe anemia.

TABLE 9: C.S.F ANALYSIS

C.S.F changes	No
Normal	03
Protein rise	02
Polymorphic pleocytosis	04
Lymphocytic pleocytosis	01
Hemorrhagic CSF with xanthochromia	01

11 patients were subjected to CSF analysis whenever there was a suspicion of Meningitis of which 5 were normal and abnormality seen in rest eight with polymorphic pl pleocytosis being the maximum.

TABLE 10: CT SCAN FINDINGS

Sinus involved	No	Percentage
Sagittal sinus thrombosis	12	40%
Hemorrhagic venous infarction	05	16%
Venous infarction	08	26%
Straight sinus thrombosis	03	10%
Cavernous sinus thrombosis	2	08%

TABLE 11: NEUROLOGICAL STATE AT TIME OF DISCHARGE

No deficits	68%
Minimal hemiparesis	20%
Continuing deficits	12%

The total leucocyte count was done in all patients. The TLC was increased whenever there was a suspicion of meningitis and LP analysis was done blood chemistry and urine routine was done in all patients. Blood sugar was normal in all patients except two where it was in high normal range.

Blood urea and creatinine was also done in all patients three patients had significantly rised blood urea serum creatinine values.

Two of them had developed prerenal failure after acute gastroenteritis which had lead to severe dehydration and prone for thrombosis a phenomenon more common in children than adults.

One patient where meningitis was suspected local infection were ruled out and as she was subjected to antiphospholipid antibody test but was normal.

PROGNOSIS:

Seven patients died in this group

The recovery pattern in the rest is as follows:

- a) Sensorium: of the total 15 alive patients who presented with altered sensorium 7 managed to recover within seven days completely
- b) Convulsion : all patients presenting with convulsion responded well to anticonvulsants.
- c) Neurological signs at the time of discharge is as shown.
- d) Of the patents who had minimal deficits only 50% could be followed up for 6 months (due to constraint of time and non compliance by few patients). Among them only 30% Had improved, rest had same deficits. Those who had continuing deficits at time of discharge, only 30% patients came up for follow-up of which only 25% had improved rest continued to have same deficits.

V. Discussion

In this study totally 30 cases were studied of which 23 were alive and 7 patients died. Study done by (Mehta SR et al¹) of the 43 patients 2 died. In the present study 7 patients died.

Sex ratio :

Observations by various series have revealed (Agarwal DS et al² M:F 1:1.38) (Mehta SR et al m:I 1:1.4).¹ Thus various rations have been obtained.

In this study it was 1:5. The superior methods of diagnosis (MR Angiography and better investigation facilities in suspected case of CVT employed by them has enabled their studies a better and correct sex ratio than the present study. Though our study is similar with increased female ratio, the discrepancy is more due to the lacuna of the present study.

Age distribution :

Comparing the age group involved 20 – 35 was the commonest age group involved In various series (Mehta SR et al 77.8%) (Ameri et al³– 11- patients 61%)

The present study also showed similar findings with 49% in the same age group and 35% were in age >35 years.

This can be attributed to peripartum being very common cause in our setup. In patients >35 years, infections and dehydration following acute GE and were the other reasons found to be more common.

Parity:

Kalbag and Woolf (1967)⁴ wrote that there probably exists increasing risk of developing CVT with increasing parity. Dubosis (1956) found a ratio of 23:18 for primi to others. The results of present study showed 60% of cases with puerperium were primi (primi 60%) is concurrent with Dubosis series.

Symptoms and clinical findings:

The symptomatology and clinical findings depends on speed of thrombosis and site of thrombosis. Headache appeared to be common in cerebral venous thrombosis, varying from 29% to 77.8% in the present study headache was seen in 94% of patients.

TABL: 12: COMPARISON OF PATIENTS WITH HEAD ACHE

Authors	Number of cases	Percentage with headache
Mehta. SR, et al (2002)	45	77.8%
Nagaraja et al ⁵ (1989)	78	71.8%
Kalbag and Woolf(1967)	34	29%
Present study	30	94%

The manifestations that indicate the cerebral cortical involvement like convulsions and paralysis closely follow headache.

Carrol et al⁶ (1966) found convulsions in 29.83% of patients Srinivasan and Natarajan⁷(1974) found convulsions in 66% and Mehta .SR et al found convulsions in 26.6%. In this present 70% of patients had convulsion of which generalized tonic clonic type was commonest.Paralysis was a common findings and usually followed convulsive phenomenon especially

In puerperal group (King⁸ 1960) Hemiplegia was the commonest form noticed in various series (Prakash c and sing⁹ 1960, Singh and padmavathi 1961)¹⁰. The present study had 34% patients with hemiplegia.Of the quadrat of presentations of CVT, papilledema is an important sign and was seen in various series. Found in 20% Srinivasan and Natarajan (1974) in 16.6%. Mehta et al (2002) in 77.8%). In this present study it was found in 50% cases.

Investigations

Anemia has often been noted and has been a Hallmark sign of puerperal CVT (Singh and Padmavathi 1961)¹⁰, similar findings has been noted in the present study.

The investigative procedures like leucocyte count, blood sugar did not contribute much to the diagnosis and were non specific.

Except two cases where the blood urea levels were high where patients ha developed pre renal failure after acute GE. This had a definite contribution to prognosis of these patients.

In patients where risk factor like puerperium and meningitis were excluded only one patient could be investigate for antiphospholipid antibody syndrome and others it was not possible for economic reasons. Due to lack of facilities like platelet adhesive index and fibrinogen level estimation, these tests could not be done.

CSF Analysis:

The most important contribution of CSF analysis is to rule out meningitis to if present to know the type of meningitis

TABLE 13 :CSF ANALYSIS

Author – no of cases	Xanthochromia	Protein rise	Pleocytosis
Krayenbuhl ¹¹ (1967)-55	10	14	13
Jolly et al(1971)- ¹² 36	08	13	-

Present study -13	01	02	05
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- MR angiography is the gold standard investigation for case of suspected CVT but due to problem of availability and financial constraints this study, enrolled many CT proven cases. Of which superior sagittal sinus thrombosis (40%) was the commonest other findings included hemorrhagic venous infarction (16%) cavernous sinus thrombosis (8%) straight sinus thrombosis (10%). Agarwal DS et al in their study had noted that sagittal sinus was affected in 52% while sigmoid in 22%.

VI. Conclusion

CVT is an important cause of stroke especially in the peripartum settings and stroke in young, yet it is grossly under recognized.

Thrombosis of cerebral venous sinus may occur in absence of demonstrable cause, may occur in settings of hematologic disorder/ coagulation abnormality or may result from local contiguous infections process. Apart from it diverse causes, its varied presentations necessitate one to have a strong degree of suspicion in appropriate context. Once the diagnosis is made with early treatment like anti edema measures, judicious use of heparin it has a good prognosis.

SUMMARY

This study comprised of 30 patients diagnosed to have cerebral sino venous thrombosis. The observations that were made are:

- The illness was seen maximum in age group of 21 to 35 typified by the fact that puerperium forms an important causes of CVT.
- The females puerperium predominated and in males meningitis was very common .
- In patients with puerperium as the cause, primi formed the bulk of them.
- Headache was a universal phenomenon followed by convulsions, altered sensorium and fever.
- Papilledema was important sign, Hemiplegia and aphasia was also noted in few patients.
- LP whenever done showed in majority a polymorphic pleocytosis, with rise in proteins.
- Sagittal sinus thrombosis was the commonest sinus involved. In two patients cavernous sinus thrombosis was seen.
- Mortality was less, the out come and follow up gave better results as there was judicious use of heparin, anti convulsants and anti edema measures.

References

- [1]. Mehta et al. editors. abstracts of 59th annual conference of API:2004Jan18-21:Hyderabad:JAPI{51}2003.P1196
- [2]. Agarwal et al. editors. Abstracts of 59th annual conference of API:2004Jan18-21:Hyderabad:JAPI{51}2003.P12-79
- [3]. Ameri CA,BousseMG.cerebral venous thrombosis.Neuralclinic1992;10:87-111
- [4]. KalbaghRM,Woolf AL,editors.cerebral venous thrombosis.London: university press;1967
- [5]. Nagaraja D,Taly AB,puerperal cerebralsino venous thrombosis.progress in clinical neuro science1986;165-177
- [6]. Carrol JD,Lead D and Lee HA.Cerebral thrombo phlebitis in pregnancyand puerperium.QJ med :35:347
- [7]. SrinivasanK,Natarajan M.Cerebral Venous And Arterial Thrombosis In Pregnancy and puerperium.Neurological India:22:131
- [8]. KingAB.Neurological conditions occurring as complication of pregnancy. Arch NeuralPsychiatry; 63:471
- [9]. Prakashc, SinghS.CVT in puerperium.JAPI;8:363
- [10]. SingB,PadmavathiS,PathakSN.Encephalopathyin pregnancy-a study of 36 cases.Neurol India1961;9:1
- [11]. KrayenbuhlH.cerebral venous and sinus thrombosis.ClinNeurosurg1967;14:1-24
- [12]. JollySS,RaviB,SinghN.CVT in puerperium.JAPI1971;19:447