



A Study on Clinical Profile and Prognosis in Cases of Cerebral Sinus and Venous Thrombosis

KEYWORDS

Cerebral venous thrombosis, headache, anticoagulation, puerperium

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ABSTRACT *Background and objectives:* : Cerebral venous /sinus Thrombosis (CVT) is an important cause of a stroke with varied presentations but still remains a diagnostic and therapeutic challenge. A strong degree of suspicion and investigations accordingly help in instituting early treatment. *Objectives:* To evaluate of cases with confirmed cerebral sinus and / or venous thrombosis and to study these cases with reference to their clinical presentation, neuro-imaging features and their outcome on follow up. . *Methods:* A total of 30 radiologically confirmed cases of cerebral sinus and / or venous thrombosis by confirmed by CT scan/MR angio (Direct and indirect findings of CVT) above the age group > 15 years of both sexes. Patients with age less than 15 years and *Results:* A total of 30 patients were included in this study. There were 23 (77%) female and 7 (23%) male patients. There was relatively uniform distribution of cases in males Whereas they were concentrated in the age group of 15-35 years (91%) in females. Headache(90%) was the most common clinical feature followed by hemiparesis (43.3%), seizures (36.6%), papilloedema (33.3%) and diplopia (16.6%). 56.6% of cases had infarct, 50% of cases had haemorrhage on CT/MRI. Superior sagittal sinus (46.6%) was the most commonly occluded venous sinus. At the time of discharge 63% of patients had a mRS score of < 2 , 3.3% of patients had a score of 2, 20% of patients had a score of 2-5 and 3.3.% (1 of 30 patients) had a score of 6. On 3 months follow up 76.6% of patients had a score of < 2. *Conclusion:* CVT was more common in women with commonest manifestation as headache. CVT was associated with good prognosis on follow up. Predictors of unfavourable outcome included diagnostic delay > 10 days, stupor or coma at admission, papilloedema, intracerebral haemorrhage and thrombosis of deep venous system.

INTRODUCTION: Cerebral venous /sinus Thrombosis (CVT) has been recognized since the early 19th century¹ but still remains a diagnostic and therapeutic challenge. Cerebral vein and sinus thrombosis is rare compared to arterial stroke often occurs in young individuals.² CVT may occur at any time from infancy to old age most reported cases were women in association with puerperium.³ Onset of symptoms may be acute sub acute or chronic.⁴ Cerebral venous infarction is the most serious consequence of cerebral venous thrombosis venous infarctions are often multifocal bilateral affecting both grey matter and sub cortical white matter.

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 neuroimaging technique, and increasing awareness of variety of presentations and effective treatment for the same has helped its cause

AIMS AND OBJECTIVES Evaluation of cases with confirmed cerebral sinus and / or venous thrombosis and to study these cases with reference to their clinical presentation, neuro-imaging features and their outcome on follow up.

MATERIAL & METHODS: This study was a hospital based cross sectional study conducted on the patients diagnosed as CVT between July 2013 and October 2015 attending the emergency department, medicine outpatient department, Neurology department, referrals from Government Maternity Hospital, who fulfilled the inclusion criteria.

Inclusion criteria

Radiologically confirmed cases of cerebral sinus and / or

venous thrombosis.

Which are admitted during the study period.

Age group \geq 15 years.

Both sexes

Exclusion criteria

Age < 15 years

Clinical / radiological diagnosis is not confirmatory.

Stroke of arterial origin were excluded.

Detailed clinical history, including obstetric history in case of females, is taken and thorough general and systemic (neurological) examination is done in all patients. Investigations included complete blood count, peripheral blood smear, lipid profile, liver function tests, random blood sugar, blood urea, serum creatinine, complete urine examination, ECG, chest - x-ray, CT scan Brain, plain and contrast, MRI brain and MR venogram. All patients with confirmed diagnosis were given the conventional treatment with heparin, oral anticoagulants, antiplatelets. Outcome is assessed at discharge and on 3 months followup using the modified Rankin Score (mRS). For complete recovery a score of 0 to 1, for partial recovery independent a score of 2, dependent a score of 3 to 5, and for death a score of 6 is given.

RESULTS:

A total of 30 patients were included in this study with age

more than 15 years and with diagnosis of CVT. Of the total 30 patients with CVT, 23 (77%) were females and 7 (23%) were males.

TABLE 1: AGE WISE DISTRIBUTION

| Sex - Age | 15 - 25 | 26 - 35 | 36 - 45 | 46 - 55 |
|-----------|---------|---------|---------|---------|
| Male | 2 | 3 | 2 | - |
| Female | 10 | 11 | 2 | - |
| Total | 12 | 14 | 4 | - |

As shown in Table 1. there was relatively uniform distribution of cases in men in the groups from 15 to 45 years. Whereas majority of cases of CVT in females were concentrated in the age group of 15-35 years (91%).

Table 2: CLINICAL PRESENTATION

| Presentation | No. of patients | Percentage (%) |
|---------------|-----------------|----------------|
| Headache | 27 | 90 |
| Visual WSS | 4 | 13.3 |
| Diplopia | 5 | 16.6 |
| Stupor / coma | 4 | 13.3 |
| Hemiparesis | 13 | 43.3 |
| Seizures | 11 | 36.6 |
| Papilloedema | 10 | 33.3 |

As shown in Table 2. headache(90%) was the most common clinical feature followed by hemiparesis (43.3%), seizures (36.6%), papilloedema (33.3%), diplopia (16.6%), visual loss (13.3%) and stupor / coma(13.3%).

CT / MRI feature in CVT was characterized by infarct or haemorrhage. 56.6% of cases had infarct, 50% of cases had haemorrhage. Some cases had both.

TABLE 3: OCCLUDED SINUS / VEIN

| Occluded sinus / vein | No. of cases | Percentage (%) |
|-------------------------|--------------|----------------|
| Superior sagittal sinus | 14 | 46.6 |
| Left lateral sinus | 11 | 36.6 |
| Right lateral sinus | 5 | 16.6 |
| Straight sinus | 5 | 16.6 |
| Deep venous system | 3 | 10 |
| Cortical veins | 5 | 16.6 |
| Jugular veins | 4 | 13.3 |
| Cavernous sinus | 1 | 3.3 |

TABLE 4: OUTCOME

| MRS | At discharge | | At 3 months follow up | |
|-----|--------------|------------|-----------------------|------------|
| | No. of cases | Percentage | No. of cases | Percentage |
| 0 | 8 | 26.6 | 13 | 43.3 |
| 1 | 11 | 36.6 | 10 | 33.3 |
| 2 | 4 | 13.3 | 2 | 6.7 |
| 3 | 3 | 10 | 1 | 3.3 |
| 4 | 3 | 10 | 1 | 3.3 |
| 5 | - | 0 | - | 0 |
| 6 | 1 | 3.3 | - | 6.7 |

As shown in Table 3 superior sagittal sinus (46.6%) was the most commonly occluded followed by left lateral sinus (36.6%). straight sinus(16.6%), right lateral sinus(16.6%), cortical veins(16.6%) of cases and deep veins (10%). The patients were assessed using mRS scoring (modified Rankin scale) at discharge and on 3 months follow up. At the time of discharge 63% of patients had a mRS score of < 2 , 3.3% of patients had a score of 2, 20% of patients had a score of 2-5 and 3.3% (1 of 30 patients) had a score of 6. On 3 months follow up 76.6% of patients had a score of < 2 and 6.7% of patients each had a score of 2, 3.5

and 6(Table. 4)

Table.5: OUTCOME IN RELATION TO KNOWN PROGNOSTIC FACTORS

| Predictor of outcome | No. of patients | Percentage (%) |
|--|-----------------|----------------|
| Diagnostic delay > 10 days | 3 / 4 | 75 |
| Stupor / coma at admission | 3 / 4 | 75 |
| Papilloedema | 3 / 4 | 75 |
| Haemorrhage | 4 / 4 | 100 |
| Involvement of straight sinus / Deep venous system | 4 / 4 | 100 |

Among the 4 patients who has an mRS score of >2 on 3 months follow up, 3 (75%) had diagnostic delay of more than 10 days, 3 (75%) had stupor/ coma at admission, 3 (75%) had papilloedema, 4 (100%) had haemorrhage on CT / MRI, 4 (100%) had thrombosis of straight sinus and / or deep venous system.

DISCUSSION

CVT is a cerebrovascular disorder, different from arterial stroke. Clinical manifestations and course on follow up are quite different from other stroke subtypes and is highly variable between studies⁵.

Data and studies on CSVT are scarce. A prospective multinational observational study, the ISCVT (International study on cerebral vein and dural sinus thrombosis) was published in the year 2002. In this particular study, 624 adult patients with CSVT were evaluated regarding the demographic, clinical and radiological features, risk factors and outcome on follow up. The predictors of outcome were analyzed using multivariate analysis. This study was conducted in 21 countries⁶.

Other studies, like the study of Maurice Preter et. al on prognosis in cerebral venous thrombosis⁷, study by Bruijn et. al on clinical features and prognostic factors in CSVT, a study on 59 patients⁸ and Douglass J. Lansler et. al on the study of risk factors for peripartum and postpartum stroke and intra cranial venous thrombosis are notable⁹.

In this particular study 30 cases of confirmed CSVT are studied. They are analysed with reference to their sex and age wise distribution, clinical presentation, signs and deficits on examination, radiological features (CT and MRI), venogram features with enumeration of sinuses and veins involved.

The outcome is assessed at discharge and on 3 months follow up using the mRS scoring. Special note is made of previously identified predictors of poor outcome like diagnostic delay, etc and their association with outcome is analysed.

In this study CVT was more common in females(77%) than men(23%).15 cases were pregnancy related (65% of females).

With regard to age wise distribution, there was relatively uniform distribution of CVT in men in the age groups 15-45 years. Whereas in women, majority of cases were concentrated in the age group of 15-35 years. This may be related in pregnancy, post partum status or the use of oral contraceptives.

Clinical features in cases of CVT were quite variable. Main features include headache, visual loss, diplopia, hemiparesis, stupor, coma, sensory symptoms, mental status disorder, papilloedema. Among these headache is the most

common presentation seen in 90% of cases. Hemiparesis is next common presentation, seen in 43.3% of cases studied. Seizures are also common seen in approximately 36.6% of cases. Papilloedema was present in 33.3% of cases. 16.6% of cases had diplopia, visual loss was the presentation in 13.3% of cases, stupor / coma was present in 13.3% of cases.

In comparison with other studies, ISCVT which is a large multinational study, has shown that among the 624 cases, the common features were headache (88.8%), seizures (39.3%), hemiparesis (37.2%) papilloedema (28.3%). Other study by Bruijn et. al has also identified headache as the most common feature⁶.

Neuro imaging modalities have brought revolutionary changes in identifying cases of CSVT. CT venogram and MR venogram can confirm the diagnosis and locate the vein / sinus with thrombosis.

On neuro imaging, infarct was found in 56.6% of patients and haemorrhage in 50% of cases. Some cases had both infarct and haemorrhage. A study by Ferro et¹⁰. al has shown infarct in 46.5% and haemorrhage in 39.3% of cases.

Superior Sagittal sinus is the most common sinus involved with occlusion seen in 46.6% of cases on venogram, followed by lateral sinuses and cortical veins. Jugular vein is thrombosed in 13.3% of cases. Deep veins are involved in 10% of cases and cavernous sinuses thrombosis is seen in 1 case (3.3%). Ferro et. al in 2002 found that superior sagittal sinus is commonly involved (62% of cases)¹⁰.

Outcome was classified according to the mRS as complete recovery (MRS 0 to 1), partial recovery independent (MRS 2), dependent (MRS 3 to 5) and death (MRS 6). The mRS score is taken at discharge and on 3 months follow up.

The mRS score of > 2 is considered as poor outcome and a score of < or = 2 is considered as favourable outcome. At discharge 76.6% of patients had favourable outcome (mRS ≤ 2) and 23.3% had poor outcome (mRS > 2), among which, one patient (3.3%) had died (MRS = 6). On 3 months follow up 86.6% of patients had favourable outcome (mRS ≤ 2) and 13.3% had poor outcome (mRS > 2). At the end of study is total of 2 (6.7%) cases have died (mRS = 6).

In 2002, Ferro et. al analysed 91 patients and found that 82% recovered completely, 8% died and the remaining had significant symptoms, signs on follow up¹⁰. In 2003, Buccino et. al found a good overall outcome in a series of 34 patients with confirmed CVT¹¹.

ISCVT study, Preter et. Al⁷, etc have identified certain predictors of poor prognosis. These include diagnostic delay > 10 days (as it delays the treatment), stupor or coma at admission, papilloedema, intracerebral haemorrhage, thrombosis of straight sinus and deep venous system. In this study, of the patients who had poor outcome on 3 months follow up (mRS > 2), these particular predictors of poor outcome are present in 75 to 100% of patients. But not all patients with these risk factors have poor outcome. In this study, the overall prognosis on 3 month follow up is good in cases with CSVT, with 86.6% of patients having favourable outcome.

was more common in women, particularly during pregnancy or post partum status. Headache was the most common presentation in CVT. CVT was associated with good prognosis on follow up. Predictors of unfavourable outcome included diagnostic delay > 10 days, stupor or coma at admission, papilloedema, intracerebral haemorrhage and thrombosis of deep venous system.

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CONCLUSIONS: Cerebral sinus and venous thrombosis