

Clinical Profile, Risk Factors for Presenting Seizures in Cerebral Vein and Dural Sinus Thrombosis

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Abstract

Introduction: Seizures in CVT can be divided into presenting seizures and early seizures. Presenting seizures are those that occurred at or before confirmation of CVT diagnosis. There is paucity of data in literature about presenting seizures in CVT patients. **Aim of the study:** To study the clinical profile and risk factors involved in presenting seizures in CVT patients. **Materials and Methods:** The study is an observational study conducted in department of neurology in a tertiary care centre in South India. The period of study is from August 2017 to July 2018. Cerebral venous thrombosis was confirmed by MRI Brain with MR venography. Demographic data, clinical findings, Neuroimaging findings and risk factors for CVT of patients with presenting seizures were captured. Descriptive statistics were used wherever necessary. **Results:** 14 patients out of 78 had presenting seizures (17.94%). 8 patients were female (57.1%) and 6 patients were male (42.9%). Mean age in the study group was 37.42 ± 2.69 . Headache was present in 11 patients (78.57%). Seizures were focal in 4 patients (28.57%) and generalized in 10 patients. (71.43%). Superior sagittal sinus was involved in 7 patients (50%). Supratentorial lesion was seen in 13 patients (92.85%). Lesion in frontal lobe was seen in 6 patients (42.85%). **Conclusion:** The presenting seizures were more common in females, more frequent in patients with multiple risk factors, more common with frontal lobe involvement and more common with superior sagittal sinus involvement. Incidence of seizures is high in patients with any supratentorial lesion.

Keywords: CVT; Presenting Seizures.

Introduction

Approximately one third of CVT patients experience focal or generalized seizures before the diagnosis of cerebral vein and dural sinus thrombosis (CVT) is confirmed [1].

These seizures may not have a significant independent influence on long-term prognosis. However, they may be a cause of early death [2].

Seizures in CVT can be divided into presenting seizures and early seizures. Presenting seizures are those that occurred at or before confirmation of

CVT diagnosis. Early seizures are those experienced after confirmation of the diagnosis of CVT [3].

There is paucity of data in literature about presenting seizures in CVT patients. The present study attempts to study the clinical profile and risk factors involved in presenting seizures in CVT patients.

Materials and Methods

The study is an observational study conducted in department of neurology in a tertiary care centre in South India. The period of study is from August 2017 to July 2018. Cerebral venous thrombosis was confirmed by MRI Brain with MR venography. Demographic data, clinical findings, Neuroimaging findings and risk factors for CVT of patients with presenting seizures were captured. Descriptive statistics were used wherever necessary.

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Received on 22.08.2018, Accepted on 17.09.2018

Results

During the period of the study 78 patients had CVT. 14 patients out of 78 had presenting seizures (17.94%). 8 patients were female (57.1%) and 6 patients were male (42.9%). The youngest patient was 18 years old and oldest patient was 53 years old. Mean age in the study group was 37.42±2.69. Headache was present in 11 patients (78.57%). Global aphasia was seen in one patient (7.1%). Right hemiparesis was seen in 1 patient (7.1%). Papilledema was present in one patient (7.1%). Seizures were focal in 4 patients (28.57%) and generalized in 10 patients. (71.43%) (Table 1). Superior sagittal sinus was involved in 7 patients (50%), Cortical veins were involved in 6 patients (42.85%). Left transverse sinus was involved in 4 patients (28.57%).

Left sigmoid sinus was involved in 4 patients (28.57%). Right transverse sinus was involved in 3 patients (21.42%), Right sigmoid sinus was involved in 2 patients. (14.28%) Straight sinus was involved in one patient (7.1%). Right internal jugular vein was involved in one patient (7.1%). Infarcts were seen in 6 patients (42.85%). Hemorrhage was seen in 7 patients (50%). Supratentorial lesion was seen in 13 patients (92.85%). Lesion in frontal lobe was seen in 6 patients (42.85%). Lesion in the parietal lobe was seen in 5 patients (35.71%). Lesion in the temporal lobe was seen in 2 patients. (14.28%). Lesion in the occipital lobe was seen in one patient (7.1%) (Table 2) Anemia was seen in 5 patients (35.71%). Urinary tract infection was seen in 5 patients (35.71%). One patient had hyperhomocysteinemia (7.1%). One patient had papillary carcinoma of thyroid (7.1%) (Table 3).

Table 1: Demographic data and clinical features

Age	Sex	Headache	Aphasia	Paresis	Sensory Symptoms	Mental Status	Focal Seizures	Gtcs	Papilledema
45	Male	No	No	No	No	Normal	Right	No	No
42	Male	Yes	No	No	No	Normal	No	Yes	No
45	Female	Yes	No	No	No	Normal	Right	No	No
40	Female	Yes	No	No	No	Normal	No	Yes	No
53	Female	Yes	No	No	No	Normal	No	Yes	No
38	Male	Yes	No	No	No	Normal	No	Yes	No
42	Male	Yes	No	No	No	Normal	No	Yes	No
29	Female	Yes	No	No	No	Normal	No	Yes	Yes
22	Male	Yes	Yes	No	No	Normal	Right	No	No
37	Female	Yes	No	No	No	Normal	No	Yes	No
33	Female	No	No	No	No	Normal	No	Yes	No
50	Female	Yes	No	No	No	Normal	No	Yes	No
30	Male	No	No	No	No	Normal	Left	No	No
18	Female	Yes	No	Right hemiparesis	No	Normal	No	Yes	No

Table 3: Risk factors for CVT

Age	Sex	Thrombophilia, genetic	CNS infection	All infections	All malignancies	Anemia	Vasculitis
45	Male	No	No	UTI	No	No	No
42	Male	No	No	No	No	No	No
45	Female	No	No	UTI	No	No	No
40	Female	No	No	No	No	Yes	No
53	Female	No	No	UTI	Papillary ca thyroid	No	No
38	Male	No	No	No	No	No	No
42	Male	No	No	No	No	No	No
29	Female	No	No	No	No	No	No
22	Male	No	No	No	No	No	No
37	Female	No	No	UTI	No	Yes	No
33	Female	No	No	UTI	No	Yes	No
50	Female	No	No	No	No	Yes	No
30	Male	Hyper homocysteinemia	No	No	No	No	No
18	Female	No	No	No	No	Yes	No

*UTI- Urinary tract infection

Table 2: Sinus involvement and supratentorial lesion

Age	Sex	Superior sagittal	Inferior sagittal	Straight	Left transverse	Right transverse	Sigmoid left	Sigmoid right	Internal jugular right	Internal jugular left	Deep system	Cortical veins	Any infarct	Any intracerebral hemorrhage	Any supratentorial lesion
45	Male	No	No	No	No	No	No	No	No	No	No	YES	Left Parietal	No	Yes
42	Male	No	No	No	Yes	No	Yes	No	No	No	No	No	No	Left temporal bleed	Yes
45	Female	No	No	No	No	Yes	No	Yes	No	No	No	No	Right centrum semiovale, parietal	No	Yes
40	Female	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No
53	Female	No	No	No	No	Yes	No	Yes	No	No	No	No	NO	Right occipital bleed	Yes
38	Male	Yes	No	No	No	Yes	No	No	No	No	No	No	NO	Right parietal	Yes
42	Male	Yes	No	No	No	No	No	No	No	No	No	Yes	Right frontal infarct	No	Yes
29	Female	No	No	No	No	No	No	No	No	No	No	Yes	NO	Bilateral frontal	Yes
22	Male	No	No	No	Yes	No	Yes	No	No	No	No	No	NO	Left temporal	Yes
37	Female	Yes	No	No	No	No	No	No	No	No	No	Yes	B/I frontal, left parietal	No	Yes
33	Female	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	B/I corona radiata, splenium	No	Yes
50	Female	Yes	No	No	Yes	No	Yes	No	Yes	No	No	No	B/I frontal	No	Yes
30	Male	Yes	No	No	No	No	No	No	No	No	No	No	No	Right frontal	Yes
18	Female	No	No	No	No	No	No	No	No	No	No	Yes	No	Left parietal	Yes

Discussion

In the present study, 14 patients out of 78 had presenting seizures (17.94%). Earlier studies have shown that approximately 40% of patients with CVT have seizures and 7% have seizures presenting within 2 weeks [4]. In the present study seizures were focal in 4 patients (28.57%) and generalized in 10 patients. (71.43%). No patient had status epilepticus. In our study group, patients never had any seizures previously. Ferro et al study revealed that 39.3% experienced presenting seizures before the diagnosis of CVT. Seizures were focal in 58 (9.3%) patients, generalized (from onset or secondarily) in 123 (19.7%), or of both types in 64 (10.3%). Three (0.5%) patients presented with convulsive status epilepticus. Two patients had previous epilepsy with partial complex seizures but experienced a different type of seizure, ie, motor seizures, secondarily generalized in one of them [4].

In a study by Ferro et al., 26.1% patients were males and 73.9% patients were females [4] In the present study females constituted 57.1 and males constituted 42.9%. Female sex is one of the major risk factors for CVT [5].

Headache was present in 11 patients(78.57%) in our study. It was present in 84.5% of patients in a study by Ferro et al. [4]. Earlier studies have shown that headache is the most common symptom affecting approximately 90% of patients with CVT.

The presentation of headache associated with focal symptoms or seizures may point towards the presence of a venous infarction [6].

Mean age in the study group was 37.42 ± 2.69 (mean \pm SD). CVT is primarily a stroke type that affects individuals younger than the age of 50. In the 624 cases included in the International Study of Cerebral Venous Thrombosis (ISCVT), the median age was 37 years [1].

In the present study, aphasia, hemiparesis and papilledema was seen in a patient each. (7.1%). 22.4% patients had aphasia and any paresis was found in 51.8% of patients in a study by Ferro et al. [4].

In the present study, Superior sagittal sinus was the most commonly involved and was seen in 7 patients (50%). Second most common involvement was of cortical veins seen in 6 patients (42.85%). Left transverse sinus was involved in 4 patients (28.57%). Left sigmoid sinus was involved in 4 patients (28.57%). Right transverse sinus was involved in 3 patients (21.42%), Right sigmoid sinus was involved in 2 patients. (14.28%) Straight sinus was involved in one patient (7.1%). Right internal

jugular vein was involved in one patient. (7.1%) In a study by Ferro et al. sagittal sinus was the most commonly involved sinus constituting 73.4% of patients followed by left lateral (39.8%), right lateral (36.9%), cortical veins (28.7%), straight sinus (10.2%) and deep venous system (8.2%) respectively [4]. Earlier studies have shown that the most commonly affected venous sinus is the superior sagittal (62%) followed by the transverse sinus (41% to 45%). Patients less commonly present with deep cerebral venous occlusion of the internal cerebral vein or vein of Galen (11%), or straight sinus (18%) [1].

Infarcts were seen in 6 patients (42.85%). Hemorrhage was seen in 7 patients. (50%). Supratentorial lesion was seen in 13 patients (92.85%). In the study by Ferro et al, on neuroimaging any infarct was seen in 61.6% of patients, any intracerebral haemorrhage in 55.1% patients and any supratentorial lesion in 80% of patients [4].

Lesion in frontal lobe was seen in 6 patients (42.85%). Lesion in the parietal lobe was seen in 5 patients (35.71%). Lesion in the temporal lobe was seen in 2 patients. (14.28%). Lesion in the occipital lobe was seen in one patient (7.1%) Concerning risk factors for presenting seizures, in the VENOPORT study, presenting seizures were associated with parenchymal lesions on admission CT/MR [3]. Bousser et al. stated that seizures are more frequent when the lesion is anterior to the central sulcus [7]. Jacob et al. noted that parenchymal cerebral lesions, particularly when located supratentorially, may have cortical involvement with an increased risk of seizures. Occlusion of the superior sagittal sinus and cortical veins which drain from the upper convexity of the brain, including the motor and sensory cortices, may also increase such risk [8].

Regarding risk factors for CVT, in the present study anemia was seen in 5 patients (35.71%). Urinary tract infection was seen in 5 patients. (35.71%). One patient had hyperhomocysteinemia (7.1%). One patient had papillary carcinoma of thyroid. (7.1%). No patient had oral contraceptive exposure. No patient was pregnant and no patient was in puerperium. Thrombophilia and vasculitis was not seen in any patient. In the study by Ferro et al. oral contraceptive use was seen in 33.1% of patients. 19.6% patients were in pregnancy/puerperium. Thrombophilia was seen in 37.6% of patients. CNS infection was seen in 2.4% of patients. All other infections were seen in 9% of patients. Malignancies were seen in 6.5% of patients, Haematological conditions in 12.7% of patients and Vasculitis in 3.3% of patients [4].

The association between presenting seizures and pregnancy/ puerperal CVT is not very clear. A very high percentage of seizures in pregnancy/ puerperal CVT is noted in some series [9,10] but not in others [11].

Ferro et al observed that presenting seizures were more frequent in patients with superior sagittal sinus and cortical vein thrombosis, any cerebral lesion on admission in CT/MRI brain, pregnancy/ puerperal CVT and in patients with motor deficits.

Conclusion

The presenting seizures were more common in females, more frequent in patients with multiple risk factors, more common with frontal lobe involvement and more common with superior sagittal sinus involvement. Incidence of seizures is high in patients with any supratentorial lesion.

Limitation of the study

Limitation of the present study was small number of patients.

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