Cerebral venous sinus thrombosis: Incidence, prevalence and patterns of neurological involvement: a retrospective study from Pakistani population

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Aims and objectives

Introduction:
Cerebral venous sinus thrombosis (CVST) occurs secondary to thrombosis within the cerebral veins and dural sinuses. It hinders proper drainage of deoxygenated blood from brain resulting in drastic hemodynamic changes which can be fatal. It is more common in younger age group and women of child bearing age (1). It is not uncommon in south Asian subcontinent; however no multi-center or multi-national registry is available to define the numbers, potential risk factors and patterns of involvement and outcomes (2).

Over the past decade, epidemiology of CVST has significantly changed and is not a rare disorder anymore. Cerebral venous sinus thrombosis was first diagnosed by Ribes in 1825, who described thrombosis of dural venous sinuses on autopsy of a man who suffered from seizures and delirium (3).

Since then it was mainly diagnosed after death until 1940s when Dr Charles Symonds and others made clinical diagnosis of CVST on the basis of lumbar puncture and specific signs and symptoms (4, 5). Introduction of venography in 1951, further enhanced diagnosis of cvst in living subjects (6).

It also helped in differentiating cases of idiopathic intracranial hypertension which have similar presentation (7).

Treatment of cvst with anticoagulant heparin was introduced by British gynecologist Stansfield in 1942 and reinforced by clinical trials in 1990s. (5, 8).

The clinical presentation and causal factors of this disorder is highly variable, therefore, imaging plays a prime role. Magnetic resonance (MR) imaging, unenhanced computed tomography (CT), unenhanced time-of-flight MR venography, and contrast material-enhanced MR venography and CT venography are the current techniques used to detect cerebral venous thrombosis and related brain parenchymal complications (9).

CVST is being diagnosed clinically and by non-invasive imaging techniques early in its course and has better prognosis and non-fatal outcomes.

We attempt to find incidence, prevalence and patterns of cerebral venous involvement in CVT in a single tertiary care unit from Pakistan.

Purpose and objectives: Over the past decade the epidemiology of CVST has significantly changed and is not a rare disorder anymore. We aimed to determine incidence, prevalence and patterns of neurological involvement in CVST patients presenting at a tertiary care hospital in Karachi, Pakistan. Also, we aimed to describe
patterns of neurological involvement in CVST patients presenting at a tertiary care hospital.
Methods and materials

Methods and materials:

A cross-sectional analytical study was designed to elicit data from the department of Radiology at the Aga Khan University Hospital from January 2007 till December 2012. Patients of either sex were retrospectively recruited from medical record database if they presented with or were referred from the department for evaluation of suspected CVST after an informed consent via non-probability convenience technique. They were excluded if their MRV was normal or contraindication to MR and claustrophobia. Diagnosis of CVST was made on a partial or complete absence of filling of one dural sinus on two projections on post contrast magnetic resonance venogram.
Results

Results:

Mean age was 37.46 ± SD 15.4 years, range: 72 years, minimum 4, and maximum 76 years. Out of the total sample of 61, 28(46%) were males. Nearly half of the patients, 31(51%) were admitted in the ward, 23 (37%) presented in the Emergency and the rest were out-patient clinics 7(21%) with Neurology as the main referral. Out of the total, 29(48%) presented with an infarct and 3(5%) with SAH. Infarcts were more pronounced in females. Regarding clinical features, most commonly presented symptom was headache and weakness, 16 (26%) and 14 (23%) respectively. Seizures 6(9.8%) and fever 2(3%) were the least presented symptoms followed by vertigo 1(1%). There was no history available for 5 patients of the total sample. Majority of the patients did not present with any co-morbid state. Out of total 33 females, 10 (30%) were post-partum, 7(12%) were suffering from malignancy, 3(5%) with infection and one each presented with hypertension and congenital disease. Therefore, 29 (47%) presented with only thrombosis without parenchymal abnormalities like SAH or infarct. 6-year radiological/imaging Incidence of CVST was calculated by 61/597 = 10.22%. 6-year radiological/imaging prevalence of CVST was calculated by 66/597 = 11.055%.

Mode of onset of symptoms was variable. acute in .., subacute,

Pattern of sinus involvement was multi sinus involvement, major combination was superior sagittal, sigmoid and transverse 9(15%), sigmoid and transverse 8(13%), all sinuses 5 (8.2%) followed by transverse sinus, cortical vein, internal jugular vein, sigmoid and vein of Galen.
Fig. 1: There is thrombosis left transverse sinus occlusion along with left sigmoid sinus thrombosis

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Fig. 2: Left temporal lobe haemorrhage associated with CVST.

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**Fig. 3:** Thrombosis of superior sagittal sinus till torcula with extension into the left transverse sinus associated with parenchymal haemorrhage, oedema and subarachnoid haemorrhage.

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**Fig. 4:** Trend of CVST patients over 6-year period at a tertiary care centre in Pakistan

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Conclusion

We computed 6-year imaging incidence and prevalence of CVST to be 10.22% and 11.055% respectively. Major combination of neurological involvement was CVST with associated parenchymal abnormalities and major combination was superior sagittal, sigmoid and transverse sinus.
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