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A CASE SERIES ON VARIOUS CLINICAL PRESENTATIONS OF CENTRAL VENOUS SINUS THROMBOSIS

General Medicine

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ABSTRACT

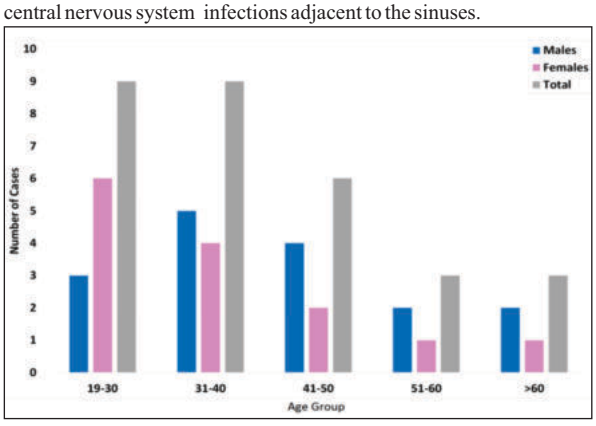
Cerebral sinus venous thrombosis (CSVT) is a rare phenomenon that can be seen with some frequency in young patients. CSVT is a multifactorial condition with gender-related specific causes, with a wide clinical presentation, the leading causes differ between developed and developing countries, converting CSVT in a condition characterized by a highly variable clinical spectra, difficult diagnosis, variable etiologies and prognosis that requires fine medical skills and a high suspicious index. Patients who presents with CSVT should undergo CT-scan venography and to the proper inquiry of the generating cause. CSVT is a multifactorial condition with sex-related specific causes. As in any thrombotic process, risk factors are associated with the classical Virchow triad of thrombogenesis: hypercoagulability, vessel wall damage and blood stasis. In 30% of CSVT cases, it presents in an acute fashion and the symptoms appear in less than 48 hours. In up to 50% of cases, it presents in a sub-acute fashion and the symptoms appear between 48 hours and 30 days. The chronic form corresponds to 20% of cases, and the symptoms develop over a period greater than 30 days and up to 6 months.
Here, four different etiologies of CVST is being highlighted.

KEYWORDS

INTRODUCTION:

Venous sinus thromboses are venous blood clots of the major veins of the brain. They can be provoked or unprovoked, and the signs and symptoms thereof will depend on the location and extent of the clot. Common locations for sinus thrombosis include the dural sinuses, the cavernous sinus, and deep sinuses of the cortex.

There can be an underlying prothrombotic state, such as inherited coagulopathy, malignancy, oral contraceptive use, pregnancy, infection, or trauma. In the case of dural sinus thrombosis, likely antecedent infections would be meningitis, brain abscess, or other central nervous system infections adjacent to the sinuses.



Causes in adults include :

- Pregnancy
- High levels of post-pregnancy estrogen
- Medications with estrogen like birth control pills, patch, or ring
- Problems forming blood clots
- Cancer
- Obesity
- Collagen vascular diseases like lupus, Wegener's granulomatosis, and Behcet syndrome
- Low blood pressure in your brain
- Gut conditions like Crohn's disease or ulcerative colitis
- COVID-19

Symtoms :

CVST symptoms vary depending on where the clot forms in your brain. It can cause stroke-like symptoms including:

- Headaches
- Blurred vision
- Fainting
- Loss of control over movement in part of the body
- Seizures
- Coma
- Confusion
- Trouble speaking
- Numbness in legs, arms, or both Symptoms also depend on area of clot formed.

Thromboses in different locations have varying consequences

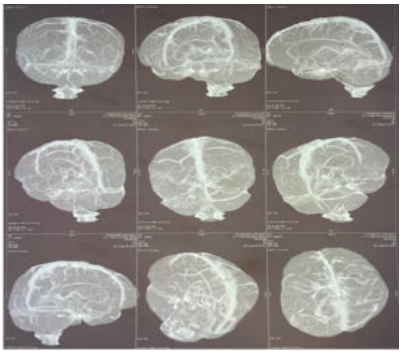
Thrombosis location	Suggestive features
Cavernous sinus	Ocular findings: pain, redness, proptosis Oculomotor palsies
Transverse sinus	Dominant hemisphere: Aphasia Seizure Elevated intracranial pressure Pulsating tinnitus
Cortical vein	Sensorimotor deficits Seizures Headache (but without papilledema)
Sagittal sinus	Motor deficits (often bilateral) Seizures Elevation of intracranial pressure (e.g. headache with papilledema)
Straight sinus (deep venous system)	Loss of consciousness, fluctuating consciousness (Can cause bilateral thalamic involvement)

METHOD –

Prospective study.

- **Case- 1**

24/ M , Student, presented with complaints of headache since 5 days .He was evaluated for the same, he underwent a CT Brain which was suggestive of **high intensity plagues in sagittal and sigmoid venous sinuses.**



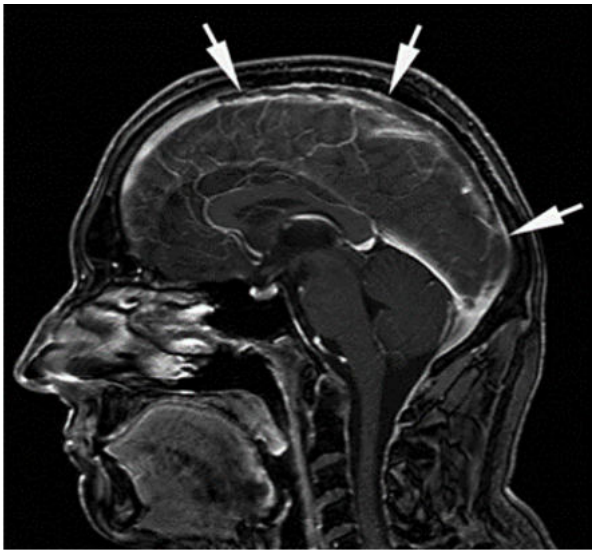
Patient was admitted and underwent CT Venograpy s/o **Left transverse and sigmoid, straight sinus and jugular bulb.**

Pt had a Hb of 19.7g%. INR of 1.13. He underwent phlebotomy thrice. JAK2 and EPO levels were normal. He was diagnosed with **polycythemia secondary to smoking** Pt was discharged on Dabigatran and Ecospirin.

- **Case – 2**

33/M , presented to the casualty with multiple episodes of siezures. Patient was a known case of seizure disorder on treatment with Levitiracetam. He was a smoker, diagnosed with **Protein C deficiency** in 2018. Past MRI venogram was suggestive of **superior sagittal sinus thrombosis**

He was started on **Warfarin 5mg**. He was non compliant with medications. His last INR was 1.3.



He was admitted to the ICU, in view of poor GCS. On repeating **INR it was 0.9.**

MRI venogram was performed which was s/o **superior sagittal sinus thrombosis, right transverse sinus thrombosis. Started on anticoagulants and antiepileptics.**

- **Case – 3-**

45/F , Covid positive in August 2020, treated in the ICU with non invasive ventilation and anti coagulants. CORADS 14/25. She presented after a month with sudden onset weakness of left sided weakness of upper limb and lower limb.

MRI Angio was normal. MRI Venogram was suggestive of a **venous infarct involving superior sagittal sinus thrombosis.**

Her INR was 1.2 on presentation, progressed to 2.1 after starting anticoagulants. Weakness gradually improved and she regained her power.

- **Case- 4**

38/M transferred to medicine from neurosurgery with alleged h/o slip and fall. Primary CT was s/o acute intraparenchymal haemmorage with cerebral edema causing midline shift.

GCS – 10/15.

CT was repeated 2 days later s/o **left transverse and sigmoid sinus thrombosis** He was started on LMWH, Mannitol and Levitiracetam.

Discharged on Dabigatran.

- **Treatment:**

1. Anticoagulant Therapy:

Anticoagulant therapy is indicated in CSVT patients to promote clot resolution and prevent clot expansion. Small-scale studies comparing the safety and efficacy of anticoagulation with placebo has shown a clinically favorable trend toward the use of anticoagulants in patients with CSVT . A meta-analysis done with these studies showed a reduction in poor outcome rates in CVT patients treated with unfractionated heparin or low-molecular-weight heparin (LMWH). The duration of anticoagulation, as well as the use of direct oral anticoagulants, is still a controversial topic since no large-scale randomized control trials are available. The 2017 European Stroke Organization guidelines for the diagnosis and treatment of CSVT, endorsed by the European Academy of Neurology, recommend the following for anticoagulation therapy in CSVT.

Therapeutic dosage of heparin to all patients with acute CVT, even in the presence of intracerebral hemorrhage.

LMWH over unfractionated heparin except in patients who are allergic to the LMWH or if fast anticoagulant effect reversal is required.

The AHA/ASA guidelines recommend anticoagulation for 3–6 months in provoked CSVT, 6–12 months in unprovoked CSVT, and potentially lifelong in recurrent CSVT, VTE following CSVT, or CSVT associated with severe thrombophilia with target international normalized ratio of 2–3.

2. Thrombolysis

CSVT patients have a favorable clinical outcome with anticoagulant therapy; however, some patients may fail to improve or clinically deteriorate despite treatment. AHA/ASA suggests that these patients may have an added treatment option of endovascular thrombolysis performed in advanced centers . Thrombolysis aids the dissolution of the clot and reopens occluded cerebral sinus or veins. A systematic review of 15 studies showed that thrombolysis has a significant increase in major bleeding complications associated with it . The thrombolysis or anticoagulation for cerebral venous thrombosis trial is an ongoing multicenter, randomized control study to determine if thrombolysis will improve outcome in severe CVT patients with poor outcome. In the near future, this study may provide a better understanding of the use of thrombolytics in CSVT patients. The British Committee for Standards in Hematology recommends that endovascular thrombolysis be used as a last resort in patients who have a fatal outcome or do not respond to anticoagulant therapy. However, it is not indicated in patients whose deterioration is attributed to intracranial hemorrhage.

3. Treatment of Raised Intracranial Pressure:

LP can be considered before initiation of anticoagulation, in the absence of parenchymal abnormalities (large infarcts or hemorrhages) in patients with intracranial hypertension.

Acetazolamide may be considered in patients with persistent papilledema.

In patients with continuing visual deterioration despite repeated LP and Acetazolamide administration, shunting procedures like lumboperitoneal, ventriculoperitoneal shunts, and optic nerve fenestration can be considered.

Steroid therapy is ineffective due to lack of scientific evidence.

Anti-edema treatment should be carried out based on the general principles of treatment for raised ICP. These include elevating head at 30°, hyperventilation (target $PaCO_2$ = 30–35 mm Hg), and intravenous administration of osmotic diuretics.

Decompressive surgery (craniectomy) is recommended in patients with severe thrombosis and with impending herniation due to a large parenchymal lesion.

CONCLUSION :

CSVT is a rare form of stroke that often affects younger age-groups, especially reproductive age-group females. The clinical presentation is variable with headache being the most common presenting symptom, and a high index of clinical suspicion is required for detecting affected individuals. The diagnosis is predominantly using a CTV/MRI/MRV and cerebral angiography if other imaging modalities fail. Anticoagulation with LMWH is the mainstay of the treatment, and endovascular thrombolysis is still controversial. Intracranial hemorrhage is not considered a contraindication to the use of anticoagulants in CVT. Patients with CVT have an increased risk of recurrence of CVT and other VTEs.

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