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Review Article

**AWARENESS OF CAVERNOUS SINUS THROMBOSIS:
A REVIEW ANALYSIS**Dr Umnah Noor¹, Dr Shazeela Maham², Dr Ammara Zafar³¹Services Institute of medical Sciences, Lahore²Rawalpindi Medical College³House Officer (Gen Surgery Ward)**Article Received:** August 2020**Accepted:** September 2020**Published:** October 2020**Abstract:**

Patients with cerebral venous sinus thrombosis (CVST) have variable presentations, especially early in the disease; 90% of them may present with migraine-like headache only that make them vulnerable to being misdiagnosed. The main objective of this review study is to analyse the awareness of cavernous sinus thrombosis (CST). This analysis was conducted in SIMS during June 2019 to January 2020. The data was collected from Google scholar, PubMed and Web of science. All the data were gathered for the clinical presentation of CST. All the data were collected and analysed. Cavernous sinus thrombosis has a distinctive clinical picture that includes, in classic acute cases, chemosis, proptosis, and painful ophthalmoplegia, initially unilateral but frequently becoming bilateral. It is concluded that early diagnosis of CST depends on the careful speculation of an experienced and oriented clinician.

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INTRODUCTION:

Cerebral venous thrombosis (CVT) is often an under diagnosed cause for acute or slowly progressive neurological deficit. It was recognized more than 150 years back, but on autopsies and was therefore always considered lethal. CVT is less frequent than arterial thrombosis, but may leave a sequel or may be fatal if not recognized and treated early. Patients with cerebral venous sinus thrombosis (CVST) have variable presentations, especially early in the disease; 90% of them may present with migraine-like headache only that make them vulnerable to being misdiagnosed. This delay in diagnosis may result in worsening of the patient's condition and makes it more difficult for them to be managed [1].

The principle pathology of CVT is thrombosis of cerebral veins and the commonest site of origin is believed to be the junction of cerebral veins and larger sinuses. The superficial cerebral venous system includes the cortical veins, the superior (Trollard) and inferior (Labbe) anastomotic veins and the superficial middle cerebral vein. These drain into the superior sagittal sinus (cortical and Trollard), the transverse sinus (Labbe) and cavernous sinus, respectively. The basal vein of Rosenthal, vein of Galen and transcerebral venous system drain the deep structures of the brain and form the inferior sagittal sinus and straight sinus [2].

Once a thrombus is formed in the cerebral or cortical veins, its extension can occlude large draining venous sinuses. This creates physiological back pressure in the venous system, leading to cerebral oedema and, in some cases, infarction and haemorrhage. Dural sinus thrombosis is also thought to reduce cerebrospinal fluid absorption and thereby elevate intracranial pressure (ICP) [3]. Historically, CVT was diagnosed at post-mortem, but, with access to modern neuroimaging techniques and increased awareness among clinicians, ante-mortem diagnosis is now usual. Management of CVT is aimed at early identification and prevention of thrombus extension and complications. It has been observed in the UK that there is some variation in management of CVT and it is important to be aware of recent guidelines. Prognosis is usually good, with up to 80% of patients making a complete recovery. However, a significant minority (~13%) have a poor outcome in terms of death or severe disability [4].

Objectives

The main objective of this review study is to analyse the awareness of cavernous sinus thrombosis (CST).

MATERIAL AND METHODS:

This review analysis was conducted in SIMS during June 2019 to January 2020. The data was collected from Google scholar, PubMed and Web of science. All the data were gathered for the clinical presentation of CST. All the data were collected and analysed.

Pathogenesis of CST

Cavernous sinus thrombosis has a distinctive clinical picture that includes, in classic acute cases, chemosis, proptosis, and painful ophthalmoplegia, initially unilateral but frequently becoming bilateral. Dramatic complications can occur such as extension to other sinuses and stenosis (with a mycotic aneurysm in one case) of the intracavernous portion of the internal carotid arteries [5]. Cavernous sinus thrombosis is not always acute, however. It can also take a more indolent form (either spontaneously or because of the masking effect of an inadequate antibiotic regimen), with an isolated abducens nerve palsy and only mild chemosis and proptosis leading to great diagnostic difficulties. The dural sinuses that are most frequently thrombosed are the superior sagittal sinus, the lateral sinus (transverse sinus and sigmoid sinus), and cavernous sinus. Less frequently affected are the straight sinus and the vein of Galen. Still rarely smaller cortical veins may be the primary site of thrombus formation without evidence of thrombus in the major sinuses or the thrombus in the major sinus would have resolved by the time the patient comes to clinical attention. This is one reason for the misdiagnosis in CT and MRI. Occlusion of a venous sinus and/or cortical vein is usually caused by a partial thrombus or an extrinsic compression that subsequently progresses to complete occlusion [6].

Risk factors of CST

The clinical presentation is usually due to the venous obstruction as well as impairment of the cranial nerves that are near the cavernous sinus. Headache is the most common presenting symptom. The headache is sharp, increases progressively and is usually located to the regions innervated by the ophthalmic and maxillary branch of the trigeminal nerve [7]. A sinusitis or a midface infection as e.g a furuncle may be present. Not all patients have periorbital edema in the early stages. Without effective therapy signs appear in the contralateral eye by spreading to the contralateral cavernous sinus through the communicating veins. Eye swelling begins as a unilateral process and spreads to the other eye within 24-48 hours via the inter cavernous sinuses.

CVT refers to any clot in the cerebral venous system. It is divided into deep, superficial, and dural venous sinuses [1]. CVST is a rare form of VTE. It represents approximately 0.5 to 3% of all types of strokes. Ninety percent of these strokes present with thrombosis in multiple locations, especially the sigmoid and transverse sinuses [2]. Its incidence has been reported previously to be between 2 and 5 per million per year. However, a recent study suggested a much higher incidence of 13 per million per year [3]. It can affect all ages, but is predominant in young people, with an estimated incidence of 3 to 4 per million in adults and 7 per million in children [2]. CVST is associated with sex predilection; 75% of all CVST patients are women, with a 3:1 ratio compared with men.

Treatment of CST

Septic CST should be treated aggressively by antibiotic administration. Although *S.aureus* is the usual cause broad spectrum antibiotics should be instituted promptly pending the outcome of cultures. Empiric antibiotic therapy should include a penicillinase-resistant penicillin plus a third or fourth generation cephalosporin. If a dental or other anaerobic infection is suspected an anaerobic coverage should also be added. I.V antibiotics are recommended for 3-4 weeks. Anticoagulants as heparin should be considered to prevent further thrombosis and to reduce the incidence of septic emboli [8].

DISCUSSION:

CST is a clinical diagnosis however MRI with contrast is the modality of choice to confirm its presence and to differentiate it from alternatives as orbital cellulitis which may have a similar clinical presentation. CT scan without contrast shows a high density thrombus in the cavernous sinus in only 25%. Contrast CT shows a distended cavernous sinus with a non-fat density filling defect [2]. MRI (T1 and T2) shows an absent flow void. Signals vary depending on the age of the thrombus but will be abnormal. Contrast enhancement or lack of is not a reliable indicator as the organizing thrombus can enhance. The diagnosis can generally be made by venography [1]. Digital subtraction carotid angiography is seldom necessary as MRI can also detect narrowing of the cavernous sinus part of the internal carotid artery. In the very small paediatric patients ultrasound can be used [9].

CONCLUSION:

It is concluded that early diagnosis of CST depends on the careful speculation of an experienced and oriented clinician. The CST clinical aspects are highly variable

and inconsistent. Such types of conditions are difficult to diagnose unless the physician makes a prompt effort to detect them. Missing a CST that presents with headache only is probably very common.

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