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Acute Venous Sinus Thrombosis after Chickenpox Infection

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Abstract

Introduction: Chickenpox is one of the classic childhood diseases presenting with erythmatous rashes with more severe presentation in adults in form of severe systemic and neurological complications. Cerebral venous thrombosis (CVT) is a life threatening disorder if not treated in time. We report a patient with post varicella CVT as a rare complication of primary Varicella zoster virus.

Case Report: Vasculitic arterial infarction is known while venous stroke has rarely been reported with Varicella- zoster virus infection. Here, we report an immunocompetent 18 yr old male who developed chickenpox after contact with his brother a month back. He presented with acute neurological deficit, three week after onset of skin lesion. MR venography revealed non-visualisation of left transverse sinus and left sigmoid sinus suggestive of venous sinus thrombosis.

Conclusion: Varicella infection is rarely associated with venous sinus thrombosis. Possibly hypercoagulable state produced by the infection or direct invasion of virus in venous endothelial wall with subsequent damage to endothelium leading to thrombosis could be the cause.

Keywords: Adult, venous sinus thrombosis, chicken pox

Introduction

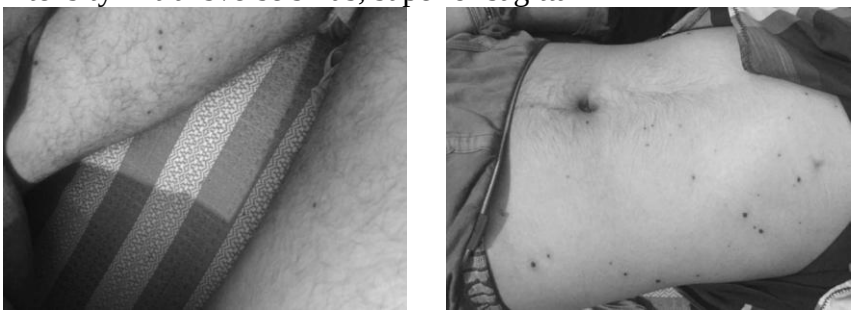
Chickenpox (Varicella) is a benign illness caused by varicella-zoster virus, predominantly in childhood. The illness presents with fever and characteristic exanthematous vesicular skin rash. Though it is a self limiting disease, Chicken pox related neurological complications are seen in less than 1% cases of chickenpox. [1]. Neurological complications frequently encountered are cerebellar ataxia and encephalitis. Less frequent complications are Guillian-Barré syndrome, menin-goencephalitis, transverse myelitis, aseptic meningitis, ventriculitis, optic neuritis, post-hepatic neuralgia, herpes zoster ophthalmicus and peripheral motor neuropathy (2).Vasculitic arterial infarction is usually known while venous stroke has rarely been reported with Varicella- zoster virus infection. We here report a young man with varicella infection who developed haemorrhagic venous infarction in the absence of hypercoagulable state.

Case Report

A 18-year-old male who had developed chicken pox around three weeks back had

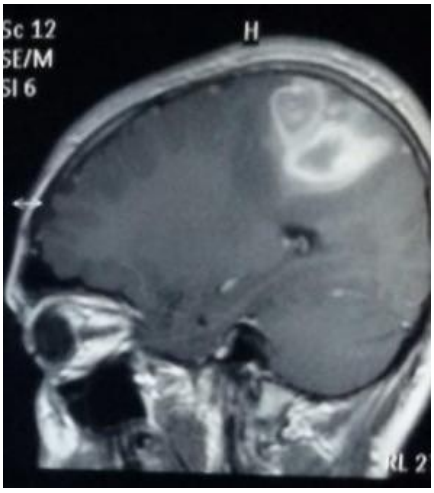
developed headache, non projectile vomiting followed by right side weakness and altered sensorium of 2 days duration. The illness started with rash predominantly on the trunk and limb and to a less degree on the face three weeks back. The lesions were centripetal and were diagnosed to be chicken pox. The lesions were in crusting stage when the patient developed neurological complaints. Patient had history of contact of chickenpox with his brother few months back. There was no history of seizures. Past history was not significant. There was no history of smoking, anticoagulation and IV drug abuse. When patient came to emergency department patient was in altered sensorium, was not arousable but response to deep painful stimuli was present. General physical examination revealed healed chicken pox lesions (Figure a and b) and normal vital parameters. He had nuchal rigidity on neurological examination. Pupils were bilateral equal reacting to light. Fundus was normal. Other neurological examination revealed normal cranial nerves with right sided hemiparesis. A plain computed tomography scan showed a haemorrhagic infarct in the left posterior-parietal lobe. A possibility of venous sinus thrombosis was considered and a magnetic resonance venography with gadolinium was done. It showed altered signal intensity area in left posterior parietal region appearing hypointense on T2W and FLAIR images while hyperintense in T1W. MR Venography showed loss of normal signal intensity in transverse sinus, superior sagittal sinus, IJV and sigmoid sinus on left side [Figure (e)]. Cerebrospinal fluid (CSF) examination done after intravenous Mannitol and dexamethasone with 24 gauge lumbar puncture needle. CSF examination showed 8 cells/mm; protein 23.6 mg%, and glucose 63.6 mg%, ADA was 3.94U/L. Varicella-specific immunoglobulin G (IgG) was positive in the cerebrospinal fluid (CSF) and blood with raised CSF/Serum ratios of VZV IgG. Routine hemogram and serum biochemistry were normal. Serology for human immunodeficiency virus (HIV), hepatitis B surface antigen (HBsAg), vasculitis, connective tissue disorders was negative. Serum antiphospholipid antibodies were negative and C-reactive protein levels were raised. Other investigation for procoagulant state like Protein C, Protein S, Factor V, antithrombin III and homocysteine levels were within normal limits. Chest X-ray and 2D Echo were normal

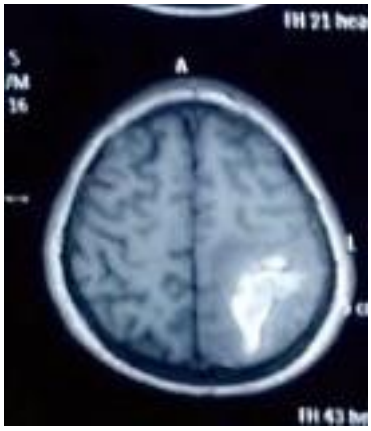
Patient was started on antioedema measures consisting of intravenous 20% mannitol and dexamethasone and injection low molecular weight heparin (Enoxaparin) 0.6 ml s/c BD for 10 days, followed by oral anticoagulation Acenocoumarol 2 mg OD. Injection Acyclovir l0 mg/kg 8 hourly was given for 10 days. Headache improved and language functions improved gradually over next few days. Right hemiparesis also gradually improved during 4 weeks of follow up. Patient was discharged on oral anticoagulants with monitoring of coagulation parameters.

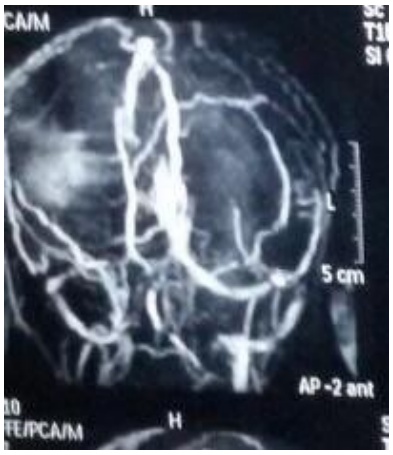


(a) (b)

Figure a and b: s/o healing lesions of chicken pox infection.







(c) (d) (e)

Figure c and d: s/o haemorrhagic infarct with significant perilesional oedema in left posterior parietal region

Figure e: showed loss of normal signal intensity in transverse sinus,superior sagittal sinus ,IJV and sigmoid sinus on left side

Discussion

Varicella is highly contagious disease of childhood with increasing incidence in adults(6). Varicella involves any organ due to the systemic nature of the disease. Disease severity has been shown to be more severe in adults(4) The latent period between the onset of varicella virus infection and neurologic complaints is usually a few days to 6 months. Central nervous system complications can follow both primary infection and reactivation of VZV including encephalitis, aseptic meningitis, transverse myelitis, acute cerebellar ataxia, Reye syndrome, Ramsay Hunt syndrome, ventriculitis, meningoencephalitis and rarely stroke. All of these complications are recognised to be due to vasculitis affecting small or large vessels. Arterial stroke is a recognised complication of VZV infection but occurrence of venous stroke has been very rarely described in the literature. Our patient had clinical features and investigations supporting diagnosis of post Varicella infection CVT. Several factors predispose to CVT which include infective and non infective causes. In this patient, occurrence of venous stroke was temporally related to chicken pox infection which could be causal factor as other causes of hypercoagulable states were appropriately excluded. Virus in the vessel wall may induce a noncytolytic infection of the smooth muscle cells in the media and functional damage to the vascular endothelium. This may result in thrombosis and promote subendothelial proliferation of smooth muscle cells, fibroblasts, and collagen, leading to areas of stenosis and occlusion. Unifocal large-vessel vasculopathy (granulomatous arteritis) usually affects elderly immunocompetent persons, whereas multifocal vasculopathy occurs primarily in persons who are immunocompromise(3). Unifocal large-vessel infarcts may follow zoster in a trigeminal distribution and are presumed to result from transaxonal transport of virus from trigeminal afferent fibers that innervate vessels of the anterior circulation(5). Similarly, smaller infarcts in deep white and gray matter may reflect transport of VZV from trigeminal or cervical afferent fibres to smaller branches of vessels of the posterior circulation.(5)(7) Venous thrombosis following chicken pox is very rare(8), the causal association in this particular case was evidenced by positive varicella antibodies in

serum and CSF. VZV vasculopathy patients do not always have VZV DNA in CSF, but diagnosis can be confirmed by anti-VZV antibody in CSF, along with reduced serum/CSF ratios of VZV IgG compared with albumin or total IgG. (7). The exact pathogenesis of varicella venous thrombosis is not known but similar to VZV arteriopathy, activated varicella may migrate transaxonally to infect meninges and venous sinuses of brain. The mechanisms underlying cerebral vascular events after VZV infection could be vasculitis, thrombosis due to direct endothelial damage, and acquired protein S deficiency(6). Since the postulated pathophysiology of infection related CVT is same as in non infectious causes, treatment is also same as in non infectious CVT.

Conclusion

Our case demonstrates that a rapid diagnosis of CVT was essential for the proper management of the patient. With this case we wish to add to the literature, CVT as another neurological complication after varicella infection. Possibly direct invasion of virus in venous endothelial wall with damage to endothelium leading to thrombosis could be the cause. Since the management of venous stroke is different than arterial stroke, once should keep higher degree of suspicious for venous stroke after Varicella Zoster infection.

Acknowledgement

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