Case Report

Challenging neurological presentations of varicella virus infections in Sudan: Clinical features, imaging and recommendations

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Abstract

Consequences of varicella zoster infection reflect a wide range of minor to serious complications involving the central nervous system. This is a case series with challenging presentations, imaging features and favorable outcome. For example, the cases presented with clinical features that resemble Brown Sequard Syndrome, transverse myelitis manner and multiple sclerosis and cognitive decline. We recommend adequate history taking, clinical examination and use of available investigation. Early treatment is likely to prevent any disabling neurological damage.

Keywords: Challenging cases, Sudan, varicella zoster

Introduction

The varicella virus is known to cause chicken pox (Varicella) for children and adults. It is usually a self-limiting condition. Transmission is either through respiratory droplets or contact of the infected fluid of the rash. Varicella viral infection is disseminated in immunosuppressed patients. The reactivation of the latent virus in the sensory ganglia causes herpes zoster (Shingles). The infection rarely occurs twice. Complications include secondary bacterial infections, pneumonitis, myelitis, encephalitis, acute toxic encephalopathy, meningitis, vasculopathy[1] for small or large vessels, optic neuritis, and cranial neuropathies. Vaccination program is highly effective in prevention of severe complications. The meningio-encephalitis may be directly related to the virus in the first week or autoimmune in nature if it occurred few weeks later.[2,3] The vasculopathy[4,5] may include infarction, hemorrhage, or development of multiple aneurysms.

In one large series of patients presenting with a stroke secondary to varicella zoster virus vasculopathy, imaging was abnormal in 97%. While more than 50% of cases showed angiographic abnormalities.[6] This may develop rapidly in some cases and cause hemorrhagic complications.[7] The small arteries were involved in 37% and more than the large arteries (13%). In the same study, the rash affected more than 63% and the CSF pleocytosis was demonstrated in 67%. The virus DNA was

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evident in only 30% of cases while the (93%) had anti-VZV IgG antibody in CSF.[1]

Immuno-competent patients may also develop segmental motor weakness following chicken pox infections.[6] Chicken pox vaccinations for over 60 years with a higher dose than that of children may reduce the morbidity and sensory complications of herpes zoster.[8] In this case series we present three patient with neurological presentations following infections with varicella zoster virus. The three patients were consented for purpose of publications of their clinical presentations.

Case One

A 46- year old Sudanese male has few months' history of gastric symptoms. He was planned for upper GIT endoscopy. There was no significant past medical history and he is not on immunosuppressive therapy. One day before endoscopy, he started to feel right lower costal pain which worsened next morning. His symptoms were initially explained by anxiety from the planned procedure. In few days time, he developed severe localized pain on the right lower costal area that radiates from the spine forward to the mid abdomen. He noticed mild change in the color of the skin in this area with redness, small vesicular rash, and soreness. These gradually improved with symptomatic treatment for herpes zoster. By the end of the second week, he started to feel heaviness of the right leg and numbness on the left. There were no urinary symptoms or fever. The clinical examination 3 weeks from the onset of neurological symptoms showed an average weight and height patient with abnormal gait. The abnormalities were confined to the central nervous system in the form of flaccid right lower limb weakness (Grade III + MRC), brisk knee and ankle jerks on the right. The right planter reflex was unobtainable. The examination of the sensory part showed normal pin prick vibration, position, and temperature sensations on the right lower limb but pain and temperature were impaired on the left lower limb which had normal power. A diagnosis of herpes zoster induced autoimmune myelitis was made and a dorsal MRI was requested. The clinical features of myelitis were in the form of Brown Sequard Syndrome. Mean while the patient was started on IV methyl prednisolone injections 1 g daily for 3 days followed by a 4 week's course of oral steroids starting with 45 mg/d. The non contrast dorsal MRI was normal and LP procedure was declined by the patient. Fortunately, the motor weakness improved and at 3 months assessment, there were minimum remaining sensory abnormalities on the left lower limb with no motor weakness on the right lower limb. The final clinical diagnosis was possible D 6 herpes zoster induced myelitis presenting clinically as Brown Sequard Syndrome. The patient was reassured and discharged from the clinic without further neurological complains for 2 years now.

Case Two

A 37-year-old Sudanese housewife (non-pregnant) was seen in the clinic because of new onset severe headache. Her problem started 4 days before when she was diagnosed as chicken pox. She had a wide spread classical rash for which she was using symptomatic topical and oral treatment in the form of analgesics. Two weeks earlier her child had chicken pox. Her headache was generalized, persistent, becoming severe with some visual blurring, dizziness, and nausea. It made her feel unusually sick. There was no significant past medical history and she was not on immunosuppressive therapy. She was admitted in the general medicine unit where her non contrast brain CT was normal. The patient then received IV fluids, NSAIDs, antiemetics, and IV antibiotics with poor response in regard to the symptoms. Seen in the neurology clinic, her clinical examination, showed a multi stage erythematous eruption (chicken pox) in an ill patient. The higher mental functions were normal. There was no evidence of cranial neuropathy, papilloedema, weakness, or sensory abnormalities. Though there were no positive neurological signs but a brain MRI was requested because the patient headache was severe. Mean while the patient was started on IV aciclovir for 2 weeks and IV methyl prednisolone injections 1 g daily for 3 days followed by a 4 week's course of low dose oral steroids starting with 30 mg/d. Her symptoms improved over 48 hours dramatically. The initial brain MRI is shown below [Figure 1]. The signals in the scan with the head pain concluded the diagnosis of varicella zoster meningio-encephalitis.

In a course of one month, she was almost a symptomatic. A follow-up Brain MRI is shown below and was reported as normal [Figure 2]. The patient was seen one year later without new neurological symptoms.

Case 3

A 29-year-old type one diabetic patient was seen because of the acute onset of left mouth deviation and poor right eye closure. He is known diabetic for 8 years and taking regular insulin therapy. There were no known micro or macro vascular complications due to his diabetes. The patient did not have recent fever of upper respiratory tract infection. The facial symptoms worsened over 2 days and he noticed difficulty closing his right eye and drooling of water from the right corner of the mouth. The neurological examination showed isolated lower motor neuron facial nerve palsy on the right side. There were no pyramidal, cerebellar, or spino-thalamic signs. The inspection of the right upper limb showed an erythematous rash that the patient noticed over the last 5 days. It was linear and showing small macular/patches that are sore but not itchy or scaly. He reported pain score of 6/10. This rash was extending from the deltoid

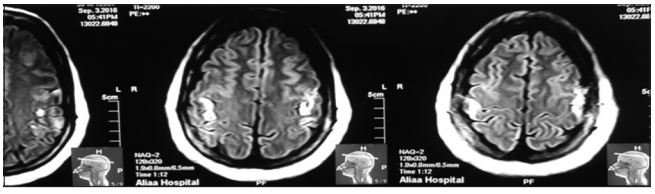

Figure 1: Picture one initial axial flair MRI image showing bilateral symmetrical high parietal hyper intense lesions representing the vasculitic changes caused by the virus

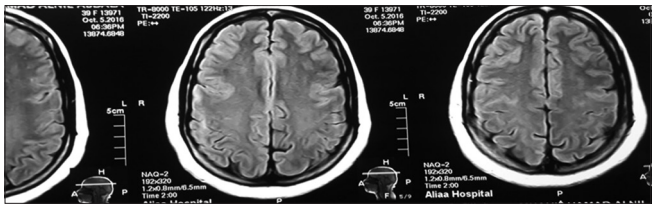

Figure 2: Follow up axial flair MRI image showing complete resolution of the previous lesions one month later

surface down to the lateral mid fore arm. However, he mentioned pain on the right side of the neck that started on the same time of the rash. There was no vesicular component to the rash. The diagnosis of right C5 herpes zoster complicated by right facial nerve palsy was made. HbA1c was 7.2% and routine blood tests were normal. The patient was started on acyclovir therapy and cervical MRI with contrast was reported as normal. Then the oral course of 30 mg prednisolone was started to help the recovery of the facial weakness along with the physiotherapy. The painful rash started to fade away over 1 week and resolved completely by the second week, while the facial weakness improved over 4 weeks. The patient remained symptoms free afterwards.

Discussion

In regard to the first case presented here, it is similar to rare literature cases where Brown Sequard Syndrome was the presentation. However, the abnormal signals where reported after the contrast MRI in either dorsal or cervical spines.[9,10] In our case the MRI was without contrast and this may reduce the chance of finding the abnormality. Moreover, the cases had variable clinical response but the imaging findings regressed over few months. In another case where the spinal cord was involved in a transverse myelitis manner, our case differs in the unilateral motor affection and sparing of sphincters. Moreover, it is similar in the rash timing being weeks before the onset of symptoms and the normal MRI image[11] which was reported in other cases.[12]

In case two, the patient rejected the procedure of the LP especially after her symptoms melted away with treatment. As mentioned in literature, the CSF pleocytosis is not important in diagnosis of VZV vasculopathy, the yield of virus DNA has low percentage and medical imaging is more sensitive to diagnose these patients.[1] However, our case here is similar to the cases described, in the presence of the rash and brain MRI changes of small vessels.

In the third case reported here, there are similarities to another literature case of elderly lady with relapsing remitting MS who was using fingolimod therapy. That patient presented with cognitive signs deteriorating into seizure disorder, MRI abnormalities, and uveitis over 3 weeks. The CSF showed the virus DNA and the patient showed clinical response on treatment with acyclovir and IV steroids. The patient reported here is also immune-suppressed being type one diabetes mellitus but younger in age group. The other difference is that he presented with peripheral nervous system involvement in the form of sensory cervical radiculopathy and lower motor neuron facial palsy in contrast to the devastating central presentation in the literature case. This may be related to the age of the patient and the reasonable diabetic control.

Another literature case differs in the age being older and has no immunosuppression and developed facial and cochlear nerve palsy. It is similar to our case in the presence of rash though the distribution was different. Moreover, it is similar in the full response to acyclovir and steroids over 4 weeks. The start of the acyclovir and steroids in our patient was justified to prevent any central extension of the varicella infection/inflammation in an immunosuppressed patient. Another important factor here was the short period of presentation which may favor the direct effect of the virus rather than the auto immune process. Fortunately, the outcome was favorable. Though it will not be definite to differentiate the response to the treatment given and the natural recovery from the sensory radiculopathy and lower motor neuron facial palsy.

Conclusion

These cases were presented because chicken pox or herpes zoster in adults is not an uncommon disease. However, the serious complications of such a condition may appear intermingled with the acute course of the illness. This may cause the treating doctor to overlook such symptomatology. Careful attention to the patient's complaint and the use of suitable investigations may prevent such a serious or rare complication from progression specially that the central nervous system was affected in the two cases and the cranial nerve in the third. Our recommendations are to start IV acyclovir standard infusions for 2 weeks in cases of cerebral involvement in the first week plus IV methyl prednisolone one gram daily over 3 days. While patients presenting beyond the 2nd week may be treated with IV methyl prednisolone one gram daily for three days followed by a short course of steroids (30–45 mg) up to 6 weeks.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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