CASE REPORT

Herpes zoster as a cause of viral meningitis in immunocompetent patients

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SUMMARY

A 30-year-old Caucasian woman, without significant medical history or immunosuppression, presented with a 7-day history of severe headache and neck pain. The patient was presumed to have tension headache versus migraine, but was admitted because her symptoms did not resolve. A lumbar puncture was performed showing lymphocytic pleocytosis suggestive of aseptic meningitis and the patient was started on broad-spectrum antibiotics and acyclovir. After admission, a rash was discovered on her left lumbar region with vesicles on top of an erythematous base. Varicella PCR was conducted on the patient's cerebrospinal fluid which was positive. Upon further history, patient was found to have previous varicella infection as a child, but no prior episodes of dermatomal zoster. Therefore, this patient was found to have aseptic meningitis and cutaneous manifestation of disseminated varicella-zoster despite immunocompetence. Antibacterial treatment was discontinued and she was continued on acyclovir for 7 days with transition to valacyclovir for 2 additional weeks with good treatment response and symptom resolution.

BACKGROUND

This is a case of disseminated varicella-zoster in a 30-year-old Caucasian woman without any significant medical history or immunosuppression. The typical work-up for aseptic meningitis does not typically include PCR of the cerebrospinal fluid (CSF) to detect varicella-zoster. However, this case demonstrates consideration of varicella-zoster as a cause of aseptic meningitis may be warranted in both immunocompromised and immunocompetent patients. Furthermore, meningeal manifestations of varicella-zoster may appear before a dermatomal rash is apparent which may or may not be painful to the patient. This is a potentially treatable condition with excellent response to antivirals unlike other viral illnesses.

CASE PRESENTATION

A 30-year-old Caucasian woman presented with a 7-day history of severe, throbbing headache and neck pain. The patient visited the emergency department on several occasions for presumed tension headache versus migraine. However, the patient's symptoms did not resolve and she began to develop worsening dizziness and loss of balance. The patient was admitted with concern for meningitis. She had minimal medical history including mitral valve prolapse and anxiety/depression and had only recently started on treatment with Celexa.

She also had a recent, diffuse rash on her lower extremities felt to be due to *Tinea corporis* treated with a 7-day course of diflucan. The patient was previously diagnosed with pneumonia in April 2012, which resolved on an outpatient course of azithromycin. Otherwise, the patient had no prior serious infections or illnesses. She lives with her husband and two children and works as a dental assistant. The patient denies any sick contacts, travel or significant outdoor/animal exposure. No tobacco, alcohol or drug use was reported. She has a family history of diabetes in both parents, but no other significant family medical history.

INVESTIGATIONS

The patient was afebrile on presentation with negative blood and urine cultures. CT head showed no acute intracranial abnormalities. A lumbar puncture was performed which revealed a glucose level of 35, protein level of 66 and white blood cell counts of 677 with lymphocytic predominance (94%). Cytology of the CSF showed chronic lymphocytic inflammation. Further studies included herpes simplex virus, cytomegalovirus, Epstein-Barr virus, enteroviruses, arboviruses, coxsackie virus, Lyme disease and ehrlichiosis were all negative. At this time, the patient's caretaker noticed a 2×2 cm in diameter, erythematous rash with raised vesicles on the left lumbar portion of the patient's back that was non-tender. CSF was tested utilising a varicella-zoster PCR which was found to be positive. An ophthalmology consult was placed and the patient was found to have a normal eye examination. Was placed on contact and airborne isolation. Testing was performed to identify potential immunocompromising states that could lead to disseminated varicella-zoster, including HIV and Hepatitis B/C, which were all negative. Furthermore, the patient had a negative pregnancy test and her absolute CD4 count was within a normal range. The patient had one febrile episode after treatment was started, but subsequent blood cultures were negative.

DIFFERENTIAL DIAGNOSIS

Upon obtaining lumbar puncture results, the patient was presumed to have aseptic meningitis from an unknown aetiology. Proposed infectious aetiologies included: herpes simplex Virus, cytomegalovirus, Epstein-Barr virus, enteroviruses, arboviruses, coxsackie virus, Lyme disease and ehrlichiosis. varicella-zoster PCR of CSF was obtained after the patient's lumbar dermatomal rash was discovered. Furthermore, after the patient was diagnosed with disseminated varicella-zoster,

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the patient was tested for various immune-compromising states including: HIV, hepatitis B/C, and pregnancy, which were all found to be negative. In addition, the patient's absolute CD4 count was within normal limits suggesting intact cell-mediated immunity.

TREATMENT

The patient was started on empiric broad-spectrum antibiotics including ceftriaxone and vancomycin as well as acyclovir intravenous for suspected meningitis. Given an initial dose of dexamethasone intravenous which was discontinued after pneumococcal meningitis was excluded. After lumbar puncture was performed and the patient was found to have disseminated varicella-zoster, antibiotic therapy was discontinued. The patient was treated with a 7-day course of acyclovir intravenous with transition to valacyclovir orally for an additional 2 weeks of therapy with good treatment response.

OUTCOME AND FOLLOW-UP

Once admitted and treatment with acyclovir was begun, patient's neck pain and headache eventually resolved. The patient did have a single febrile episode while inhouse with subsequent negative blood cultures. The patient was discharged following 7-day course of acyclovir intravenous and was transitioned to valacyclovir for an additional 2 weeks of treatment.

DISCUSSION

Varicella-zoster is a ubiquitous infection that is primarily thought to reactivate in those individuals with interrupted cell-mediated immunity, either as a result of age (as seen in the elderly population) or immunocompromise. Incidence increases with age including 2.5 cases/1000 in ages 21–50 versus 10.1 cases/1000 in those older than 80 years.¹ Furthermore, the incidence is drastically increased in HIV-seropositive patients including 29.4 cases/1000 person-years as compared to the HIV-seronegative patients with 2.0 cases/1000 person-years.² In a review of 859 patients with varicella-zoster infection, meningitis was reported in only 0.5% within 60 days of diagnosis.³ Therefore, this seemingly immunocompetent patient with disseminated varicella-zoster producing aseptic meningitis and cutaneous manifestations is a rare case finding. A similar case report was published in 1997 which featured a 37-year-old immunocompetent man sited as the first patient with laboratory-

confirmed, disseminated varicella-zoster accompanying severe aseptic meningitis.⁴ However, the overall incidence of aseptic meningitis may be under-reported. For example, a study conducted in Finland showed that an infectious aetiology was identified in 95 of 144 patients diagnosed with aseptic meningitis including 8% of cases attributed to varicella-zoster.⁵ Therefore, the actual incidence of aseptic meningitis attributed to varicella-zoster infection may be underestimated in the literature secondary to non-routine testing. Furthermore, the routine inclusion of varicella-zoster PCR of CSF following lumbar puncture may be of higher diagnostic yield than previously thought.

Learning points

- In immunocompromised as well as immunocompetent patients, utilising varicella-zoster PCR in cerebrospinal fluid may be an important diagnostic consideration.
- Disseminated varicella-zoster may present at different stages with meningeal presentation preceding dermatomal rash.
- Despite a classical zoster dermatomal rash appearance, patients may not experience pain at the lesion site.
- Patients presumed to be immunocompetent with disseminated varicella-zoster require further work-up for potential undiagnosed immune-compromising aetiologies, such as HIV infection.

Competing interests None.

Patient consent Obtained.

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