CLINICAL VIGNETTE

Varicella Zoster

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A 30-year-old female presents with burning sensation involving her left mid- back and torso region for 4 days. One day ago she noted a new painful rash in the involved areas. She denies fevers or chills and has not had similar rashes in the past. She has no allergies, does not take any prescription or over the counter medications. Her family history is not significant. She is current on all vaccinations and reports having childhood chickenpox. Her exam included normal vital signs and was only significant for blisters on an erythematous base involving the left T9 dermatome.

Discussion

Varicella zoster virus is one of the eight herpes viruses that are pathogenic only in humans.[1]

There are an estimated 1 million cases in the Unites States annually, with an individual lifetime risk of 30%.[2] After a primary infection, the varicella zoster virus remains dormant in the sensory dorsal root ganglion cells. After the primary infection, varicella zoster virus-specific memory T cells develop. The memory T cell immunity declines over time. The average period of immunity against varicella following an infection is 20 years.[1] Herpes zoster infection is usually characterized by a unilateral, painful vesicular rash which is limited to a single dermatome. The frequency of areas of involvement is thoracic > lumbar and cervical > sacral.[1] Herpes zoster increases with age. A Korean population-based study reported an incidence of 2.0/1000-person year among the childhood group, increasing to 21.8/1000-person year in those aged 70−79 years. Peak incidence of herpes zoster is in the 60−69 age group and a low incidence is noted in those aged above 80 years.

Age is a major risk factor because T lymphocyte–specific immunity to the virus wanes over time. Women are also at increased risk, whereas African-Americans have decreased risk. Conditions that decrease cell-mediated immunity (e.g., lymphoproliferative disorders, immunosuppressive drug use, human immunodeficiency virus sero-positivity) increase risk up to 20 to 100 times compared with age-matched controls.[2] Of the major risk factors for reactivation: age, family history of zoster, immunosuppression, and early primary varicella infection, older age is the most significant risk factor.[3]

Herpes zoster infection usually begins with prodromal symptoms including pain, fever, malaise, headache, itch, and paresthesias that precede the rash by a few hours to several days in most patients.[1] The active phase begins when the patients manifest the characteristic skin lesions, erythematous papules or macules which progress to vesicles in 12−24 hours, to pustules in 1−7 days, and eventually crust over in 14−21 days (resolution phase).[1]

The diagnosis of herpes zoster can be made clinically once the rash appears. Polymerase chain reaction PCR can detect varicella zoster virus DNA in the vesicular fluid, and hence, is considered the most sensitive and specific diagnostic test for herpes zoster.[1] PCR testing of vesicle or other body fluids is preferred in ambiguous cases because of high sensitivity and specificity (95% and 100%, respectively) and short turnaround (typically one day).[2] Antivirals including acyclovir, famciclovir, and valacyclovir are used to reduce acute herpes zoster symptoms. These agents help in reducing pain, promote fast healing, and prevent post-herpetic neuralgia. Treatment with antiviral should be started within 72 hours of rash onset. Corticosteroid therapy is recommended in special situations including severe acute zoster pain, Ramsay Hunt syndrome, neurological disorder characterized by facial palsy and rash affecting the ear or mouth, and ocular complications. Corticosteroid therapy is more beneficial when combined with an antiviral agent. Early administration of acyclovir and steroids has shown good improvement among adults and children in the treatment of herpes zoster oticus/Ramsay Hunt syndrome.[1]

As shingles results from reactivation of latent VZV, prevention of primary varicella infection can be considered the first step in HZ prevention.[3] In October 2017, the U.S. Food and Drug Administration approved an adjuvant recombinant VZV vaccine (Shingrix) for the prevention of shingles. The European Union and USA recommended dosage two 0.5 mL intramuscular injections administered 2–6 months apart, preferably in the deltoid muscle.[4] Shingrix, a recombinant subunit vaccine also known as HZ/su, contains the VZV glycoprotein E and the AS01B adjuvant system. VZV glycoprotein E is involved in viral replication and cell-to-cell spread and, for this reason, was selected as the vaccine antigen in combination with the AS01B adjuvant system, which strongly promotes humoral and CD4+ T cell-mediated immunity against recombinant proteins.[3] The incidence of herpes zoster in those receiving the vaccine decreased by 96% (95% CI, 90% to 98%) compared with placebo.[2] In the pivotal trials in adults aged ≥ 50 years (ZOE-50) and ≥ 70 years (ZOE- 70), RZV significantly reduced the risk of HZ and PHN. Protective efficacy waned minimally over 4

years and was well preserved in adults aged ≥ 70 years.[4] Injection-site pain, myalgia and fatigue were the most common associated symptoms in RZV recipients. Most adverse reactions were mild to moderate severity and were transient (median duration 1–3 days).[4] Because its effectiveness it is not age dependent and does not carry the risk of inducing herpes zoster it has been recommended by the Advisory Committee on Immunization Practices as the preferred method of preventing herpes zoster and postherpetic neuralgia. The vaccine is recommended for adults 50 years and older, including those who have already had the live VZV vaccine (Zostavax). The effectiveness (i.e. maintained protection) and safety of Shingrix are still unknown beyond four years.

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