Herpes Zoster in an Immunocompetent Boy Following Intrauterine Exposure to Varicella-Zoster Virus

Valentina Fabiano, MD; Dario Dilillo, MD; Silvia Mauri, MD; Teresa Vivaldo, MD; Alessandra Gazzarri, MD; Gian Vincenzo Zuccotti, MD

Herpes zoster (HZ) is caused by the varicella-zoster virus (VZV) and is considered to be a reactivation of latent infection. The first clinical manifestation of VZV infection during infancy typically presents as chickenpox; however, HZ can be observed in infants and children without a history of symptomatic varicella. We report the case of a 4-year-old immunocompetent boy who developed HZ after intrauterine exposure to VZV.

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Case Report

A 4-year-old boy presented to the emergency department with an eruption of erythematous vesicles on the right side of the face. The skin lesion began as a vesicle on the patient's right upper lip and progressed to an intense erythematous vesicular eruption covering the right cheek, right side of the nose, eyelids, temporal area, and forehead with sharp demarcation at the midline. Clinical examination revealed disturbing pruritus, intense inflammation of the right conjunctiva, edema of the eyelids, and a yellowish discharge from the eyes. The right upper quadrant of the patient's face was completely involved with distribution over the fifth cranial nerve (trigeminal nerve; V1 and V2 branches). The patient's guardians reported that he had not been eating or sleeping well but remained afebrile. Further physical examination was unremarkable. All routine blood parameters were within reference range, including immunoglobulin dosage and lymphocyte typing.

A clinical diagnosis of herpes zoster (HZ) of the trigeminal V1 and V2 dermatomes was made. Although the patient had no history of symptomatic varicella, he was exposed in utero to chickenpox during his mother's eighth month of pregnancy. Serologic results obtained at his initial presentation were negative for varicella-zoster virus (VZV) IgM titers and highly positive for an IgG titer. Polymerase chain reaction tests were performed by scraping the floor of a representative vesicle and results were positive for VZV DNA. A second antibody test was positive for VZV IgM titers and also showed an increase in IgG titers. An ophthalmologic evaluation showed the presence of corneal ulcers.

The patient was admitted to the hospital for intravenous antiviral treatment with acyclovir (10 mg/kg 3 times daily), an antibiotic therapy for prevention of possible bacterial superinfection, and an antihistamine for pruritus relief (Figure). Complete resolution of the lesions was observed after 7 days of antiviral treatment. Further ophthalmologic examination showed an improvement in corneal involvement. The patient will continue to be evaluated by the ophthalmologic department.

Comment

Epidemiology of HZ Infection in Children—Herpes zoster generally is considered to be a reactivation of a latent VZV infection in the sensory ganglia that typically is observed in adults, with the majority of cases occurring in patients older than 45 years. Although chickenpox is common in children, HZ is uncommon in the pediatric population, with an incidence ranging from 0.2 to 0.74 cases per 1000 person-years[1]; however, the disease could be more frequent because many cases are not reported due to their benign

From the Department of Pediatrics, Luigi Sacco Hospital, Università degli Studi di Milano, Italy.

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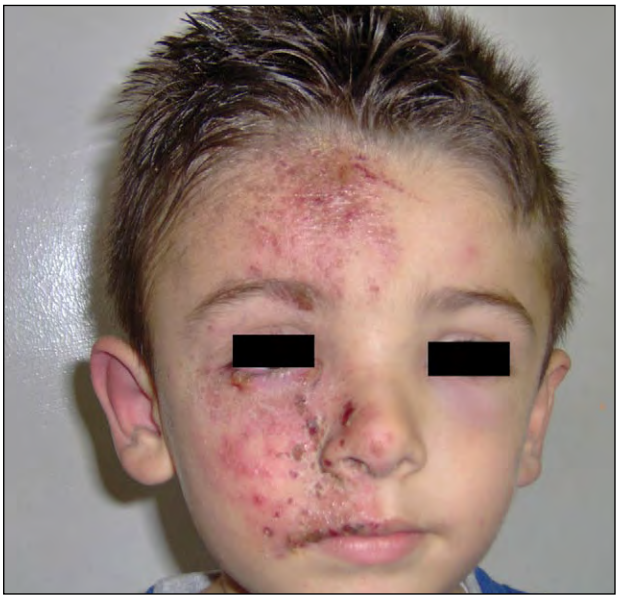
Correspondence: Valentina Fabiano, MD, Department of Pediatrics, Luigi Sacco Hospital, Università degli Studi di Milano, Via GB Grassi, 74, Milan, Italy 20157 (fabiano.valentina@hsacco.it).



An eruption of erythematous vesicles on the right side of the face with distribution over the fifth cranial nerve (trigeminal nerve; V1 and V2 branches) 2 days after initiation of treatment with intravenous acyclovir.

course. Herpes zoster infection is more common among immunocompromised children, such as those affected by malignancies, especially acute leukemia.[1,2]

Pathogenesis of HZ Infection in Immunocompetent Children—Primary VZV infection during gestation and unapparent or minimally symptomatic varicella during the first year of life represent the most serious risk factors for onset of HZ infection in immunocompetent children.[3,4] Dobrev[5] reported that maternal VZV during late pregnancy is associated with an asymptomatic congenital infection that can subsequently result in the clinical presentation of HZ infection in the child's first year of life.

Herpes zoster infection in these children who are exposed to VZV in utero or in early childhood has been attributed to the immaturity of their immune system.[3] Terada et al[6] reported that immunologic immaturity in the first year of life puts immunocompetent patients at a greater risk for developing acute HZ infection in childhood. In the same way, the fetal immune response of lymphocytes, natural killer cells, and cytokine mediators to transplacentally acquired VZV is thought to be inefficient, resulting in a failure to maintain virus in latency and increased risk for developing HZ infection in childhood.[7]

Our patient had no history of symptomatic varicella but previously had been exposed in utero to VZV during his mother's eighth month of pregnancy, which was demonstrated by the presence of VZV IgG antibodies. The patient's typical clinical presentation, history of intrauterine exposure to VZV, serologic findings, and positive polymerase chain reaction tests supported the diagnosis. The late onset of the disease in our patient was atypical. Kurlan et al[8] reported 4 cases of HZ infection in infants following early postnatal exposure to VZV; in all 4 cases, the infection developed in the first year of life. Based on a brief review of the literature, the investigators asserted that intrauterine exposure to VZV is the most frequent cause of HZ infection in immunocompetent infants.[8] More recently, Rodríguez-Fanjul et al[9] reported a series of 16 cases of HZ infection in which the median age at presentation was 22 months. Only 2 of the patients were aged 4 years and 2 were aged 5 years. In 3 patients, primary exposure to VZV occurred postnatally; intrauterine exposure, as in our case, was observed in only 1 patient.[9]

Differential Diagnosis—The differential diagnosis includes herpes simplex virus infection, dermatitis herpetiformis, staphylococcal impetigo, and urticaria. Typical dermatomal distribution is normally sufficient to make the diagnosis; however, viral culture, polymerase chain reaction, and direct fluorescent antibody testing may be used in doubtful cases.

Prognosis—The clinical course of HZ generally is less severe in children than in adults. The infection usually is mildly symptomatic with a benign clinical course and complete resolution in 1 to 3 weeks without sequelae. Possible complications include secondary bacterial infection, depigmentation, and scarring, though they are not common. Ocular HZ can occur in children with involvement of the ophthalmic branch of the trigeminal nerve; these patients should always be referred for ophthalmologic evaluation. Postherpetic neuralgia rarely has been seen in immunocompetent children.

Therapy—First-line treatment of acute pediatric HZ is administration of high doses of oral acyclovir, a well-tolerated drug with minimal toxicity.[10] Intravenous therapy is recommended for immunocompromised patients or in immunocompetent patients with trigeminal nerve (V1) involvement.

Conclusion

The first clinical manifestation of VZV infection during infancy typically presents as chickenpox. In children without a history of varicella, HZ resulting from intrauterine exposure to VZV should always be considered.

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