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Opinion Article

Pathophysiology and Diagnosis of Varicella Zoster Virus (VZV)

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DESCRIPTION

The highly contagious illness varicella, sometimes known as chickenpox, is caused by an early infection with the Varicella Zoster Virus (VZV). The disease results in a recognizable skin rash that grows into tiny, uncomfortable blisters before eventually scabbing over. Typically, it begins on the chest, back, and face. It then spreads all across the body. The disease often worsens more quickly in adults than in kids. When an infected individual coughs or sneezes, the airborne illness known as chickenpox can readily spread from one person to another. After an incubation period of 10 to 21 days, the characteristic rash appears. It may spread from one to two days before the rash appears until all lesions have crusted over. It might spread if someone touched the blisters. People with shingles may spread chickenpox to those who aren't immune by touching the blisters. However, in unusual cases, Polymerase Chain Reaction (PCR) testing of the blister fluid or scabs may be required to confirm the diagnosis. Usually, the condition can be diagnosed based on the presenting symptom. Antibodies can be checked to see if a person is immune. Usually, a person only gets chickenpox once. Despite the possibility of reinfection, the majority of the time there are no symptoms.

Symptoms and signs

In both adolescents and adults, the early (prodromal) symptoms include nausea, loss of appetite, painful muscles, and headache. After this, the usual rash or oral sores, sluggishness, and low-grade fever that signal the disease's presence appear. On rare occasions, the disease's oral symptoms (enanthem) may manifest before the external rash. Children frequently develop a rash or mouth spots as their first symptoms of an illness. In children, prodromal signs are rare. The initial signs of the rash are small red dots that appear on the face, scalp, torso, upper arms, and legs. Small bumps, blisters, and pustules develop over the period of 10–12 hours, and are then followed by umbilication and the formation of scabs.

Pathophysiology

After being exposed to the Varicella Zoster Virus (VZV), healthy children create immunoglobulin G (IgG), immunoglobulin M (IgM), and immunoglobulin A (IgA) antibodies. IgG antibodies last a lifetime and offer immunity. Cell-mediated immune responses must cooperate in order to reduce the intensity and length of the primary varicella infection. After primary infection, it is believed that the Varicella Zoster Virus (VZV) spreads from adjacent sensory nerves to mucosal and epidermal sores. The Varicella Zoster Virus (VZV) then remains latent in the dorsal ganglion cells of the sensory nerves. The reactivation of the varicella zoster virus causes the clinically distinct syndromes of herpes zoster (shingles), postherpetic neuralgia, and sporadically Ramsay Hunt syndrome type II (VZV). Varicella zoster can damage the arteries in the neck and head and cause stroke in infancy or after a protracted latency period.

Diagnosis and treatment

Examining the fluid within the vesicles of the rash or testing blood for signs of an acute immune response can also help confirm the diagnosis. Using a Tzanck smear or a direct fluorescent antibody test, vesicular fluid can be analysed. Additionally, the fluid can be "cultured," which entails making an effort to develop the virus from a sample of the fluid. Blood tests can be performed to determine an acute infection response (IgM) or a prior infection and subsequent immunity (IgG). It is recommended to wait five weeks after the first maternal infection before utilising ultrasonography to diagnose foetal varicella. It is also possible to test the mother's amniotic fluid for PCR (DNA), although this approach has a higher risk of spontaneous abortion than it does of foetal varicella syndrome development.

Children: Children with chickenpox are treated for the symptoms while the immune system fights the infection. Because they are more likely than adults to scratch their blisters more deeply, children under the age of 12 should have their fingernails clipped short and kept clean.

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Epidemiology

It is unclear where the word "chickenpox" came from, however it could have something to do with how mild the illness was. On the basis of the vesicles' likeness to chickpeas or the rash's resemblance to chicken pecks, it has been suggested that it originated from chickpeas. Other theories include the term "chicken pox" (meaning "kid pox"), a misspelling of "itching pox," or the hypothesis that poultry may have carried the disease in the past. The designation was made, according to Samuel Johnson, "from its being of no very great risk."