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A Review on Chickenpox Disease and it's Treatment

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Abstract: *The varicella-zoster virus is the infectious agent that causes varicella, also known as chickenpox. The virus causes both herpes zoster, also known as shingles, and chickenpox, which is typically the result of a primary infection in nonimmune hosts following the reactivation of a latent infection. The skin rash caused by chickenpox consists of tiny, painful blisters that scab over. This article describe the sign and symptoms, etiology, epidemiology, pathogenesis, stages of chickenpox, causes, evaluation parameters and highlights the treating and preventing this infection.*

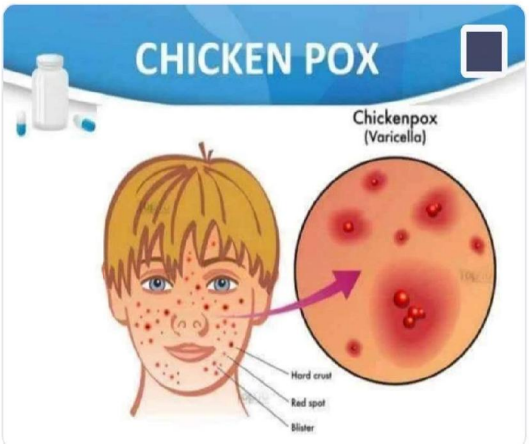
Keywords: varicella-zoster

I. INTRODUCTION

Chickenpox or varicella is a contagious disease caused by the varicella-zoster virus (VZV). The virus is responsible for chickenpox (usually primary infection in non- immune hosts) and herpes zoster or shingles (following reactivation of latent infection). Chickenpox results in a skin rash forming small, itchy blisters that scabs over. It typically starts on the chest, back, and face and then spreads. It is accompanied by fever, fatigue, pharyngitis, and headaches, usually lasting 5 to 7 days. Complications include pneumonia, brain inflammation, and bacterial skin infections. The disease is more severe in adults than in children. Symptoms begin ten to 21 days after exposure, but the average incubation period is about 2 weeks. (1)

In the past, von Bo¨kay proposed in 1892 that there was a connection between the etiologies of varicella and herpes zoster based on the finding that young children frequently had varicella after coming into contact with an adult who had ⍰ herpes zoster (249). The agent's transmissibility was proven by injecting fluid from herpes zoster lesions into children who had never had varicella before; these children went on to acquire varicella, and secondary transmission was noted.(2)

Since the varicella vaccine's introduction in 1995, fewer incidences and complications have been reported. It stops between 70% and 90% of infections and 95% of serious illnesses. Immunization of youngsters on a regular basis is advised. Even if vaccination is given three days after exposure, children's results may still improve.(3)



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Sign and Symptoms

The rash caused by chickenpox appears 10 to 21 days after you're exposed to the varicella-zoster virus. The rash often lasts about 5 to 10 days. Other symptoms that may appear 1 to 2 days before the rash include:

- Fever.
- Loss of appetite. Headache.
- Tiredness and a general feeling of being unwell.
- Once the chickenpox rash appears, it goes through three phases: Raised bumps called papules, which break out over a few days.
- Small fluid-filled blisters called vesicles, which form in about one day and then break and leak.

Crusts and scabs, which cover the broken blisters and take a few more days to heal.(4)

The Virus

The linear, double-stranded DNA genome of the VZV virus is contained in a nucleocapsid that surrounds a core; the capsid and the lipid envelope, which includes the primary viral glycoproteins, are separated by a protein tegument .Around 125,000 bp make up the VZV DNA, which has at least 69 open reading frames (ORFs). (5)

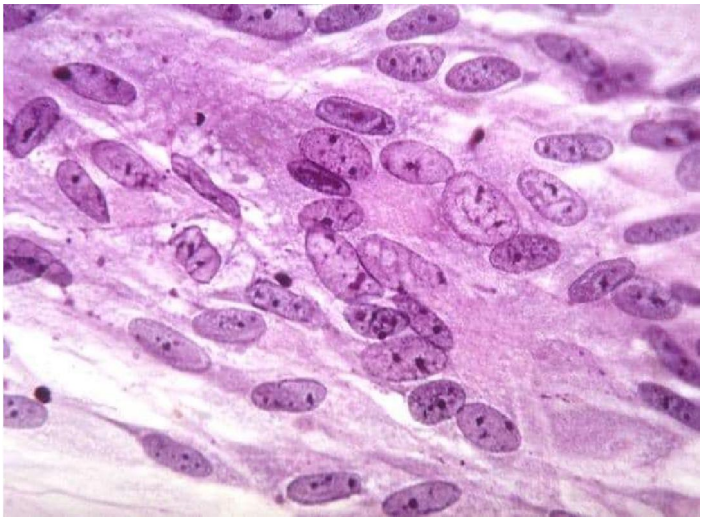

Figure : image of virus

Etiology

ZV's infectivity is largely species-specific. The virus can infect certain small animals, such as rats and guinea pigs, and non-human primates, however infection does not result in VZV illness.

This herpes virus, known as varicella-zoster virus (VZV), is the cause of chickenpox, also known as varicella. It is found all over the world. It creates latency following primary infection, which is a characteristic of the majority of herpes viruses. (6)

Epidemiology

Every country experiences varicella, which causes roughly 7000 deaths a year. It is a frequent ailment among children in temperate regions, with the majority of cases occurring in the winter and spring. It is the cause of over 9000 hospital admissions in the US each year. It is most common in the age range of 4 to 10 years old. 90% of people get infected with varicella. Compared to main instances, secondary cases among household contacts typically have more severe disease.

Varicella is more common in older persons in the tropics and can lead to more serious illnesses. Adults get more noticeable scars and deep pockmarks.(7)

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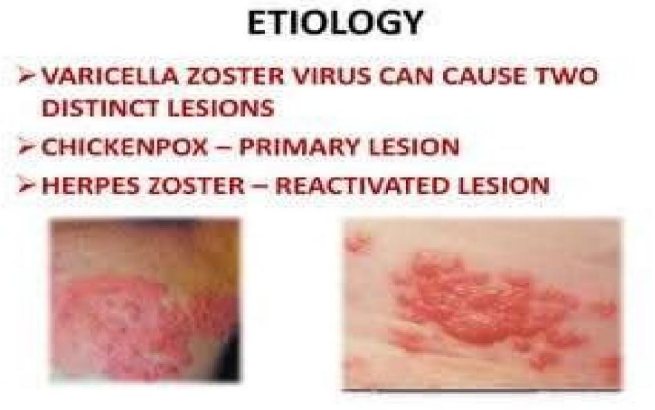

The study of varicella, or chickenpox, epidemiology is an important aspect of public health research and disease surveillance. Because varicella is contagious, widely distributed, and can result in serious complications, it has been the focus of numerous epidemiological investigations. Varicella is caused by the varicella- zoster virus (VZV). (8)

Pathogenesis

Exposure causes the production of host IgG, IgM, and IgA. IgG antibodies persist for life and confer immunity. Cell-mediated immune responses are important in limiting the duration of primary varicella infection. After primary infection, varicella is theorized to spread to mucosal and epidermal lesions to local sensory nerves. It then remains latent in the dorsal ganglion cells of the sensory nerves. The immune system keeps the virus in check. However, reactivation can still occur later in life, resulting in the clinically distinct syndrome of herpes zoster (shingles), postherpetic neuralgia, and sometimes Ramsay Hunt syndrome type II. Varicella zoster can harm the arteries in the neck and head, resulting in a stroke.

The Immune mechanisms of the host prevent the virus from replicating. In the event that host immune mechanisms are weakened, reactivation may happen. Medication side effects, disease, starvation, stress, and aging's natural reduction in immunological function are all potential causes of this. Reactivation of the virus causes sensory loss, discomfort, and other neurologic problems as it travels along sensory nerves. In addition to sensory alterations, weakness may also occur if motor nerve roots are affected. Although it is uncommon, leptomeningeal involvement can occur when the trigeminal nerve's ophthalmic branch is affected.(9)

Stages of chickenpox

Chickenpox develops in stages. Before the rash appears, there may be: fatigue or a general feeling of being unwell (malaise)

fever that lasts 3-5 days and is usually less than 102 °F (39 °C). loss of appetite

Muscle or joint aches

cold-like symptoms such as a cough or runny nose headache

After these symptoms, the following will happen:

An itchy rash will present on the face, body, or inside the mouth. The rash will develop in spots and sometimes can also appear on the eyelids or the genitals. The severity of the rash can vary.

The rash will develop into fluid-filled blisters that will turn cloudy. These blisters make take Source days to heal. As there may be many blisters, some may heal sooner than others.

The blisters will become scabs. The scabs will fall off after about a week.(10)

Causes

A virus causes chickenpox. Viruses spread when a person with the virus gives it to another person either through bodily fluid (coughing, sneezing, etc.) or bodily contact (touching the rash).

Chickenpox spreads by :

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Coming in contact with someone who has chickenpox. Breathing air from an infected person who sneezes or coughing. Coming in contact with fluids from an infected child's eyes, nose or mouth. (11)

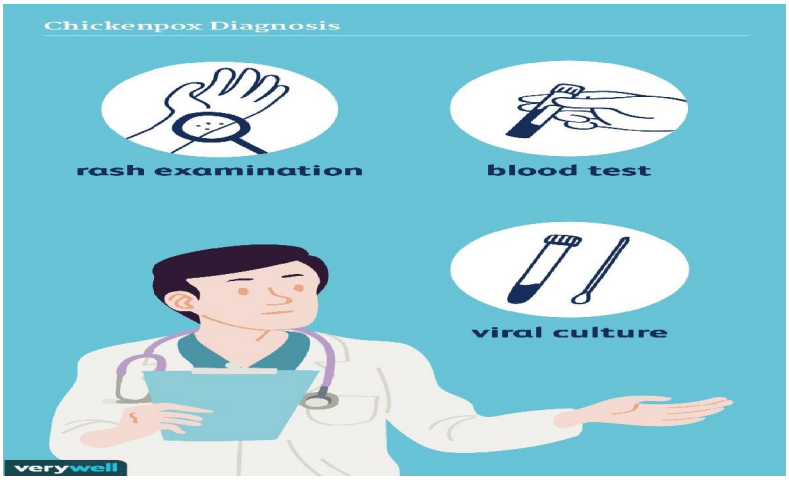
Evaluation parameters

The signs and symptoms are the main criteria used to diagnose varicella infection. The fluid inside the vesicles is examined, lesions that have not crusted are scraped, or blood is tested for signs of an acute immune response to confirm the diagnosis. (12)

Laboratory tests

Laboratory tests are not routinely necessary for the diagnosis of chickenpox, as clinical presentation and history are often sufficient. However, in certain cases, especially those with atypical presentations, or when there is a need to confirm the diagnosis or rule out complications, the following tests may be considered.

1. Viral Culture : VZV can be cultured from vesicular fluid, throat swabs, or other clinical specimens. Culture is most commonly used in research or when confirmation is essential.
2. Polymerase Chain Reaction (PCR) : PCR testing can detect VZV DNA in various clinical samples, offering high sensitivity and specificity. It is particularly useful for confirming the diagnosis in atypical cases and can differentiate VZV from other herpes viruses.
3. Serological Tests: tests measure the presence of varicella-specific antibodies, including treatment IgG. IgM antibodies typically indicate acute infection, while IgG antibodies suggest previous exposure or vaccination. Serological testing can help confirm the diagnosis and assess impurity.(13)



Treatment / Management

The goal of treatment is to reduce symptoms. Those who are infected are usually required to stay at home while they are contagious as a precaution. Wearing gloves and trimming nails short can help stop scratches and lower the chance of developing secondary infections.

In children: Acyclovir decreases symptoms by 1 day if taken within 24 hours of the start of the rash. Still, it does not affect complication rates and is not recommended for individuals with normal immune function.

In adults, infection tends to be more severe, and treatment with antiviral drugs (acyclovir or valacyclovir) is advised if they can be started within 24 to 48 hours of rash onset. Supportive care, such as increasing water intake and using antipyretics and antihistamines, is important to management. Antivirals are typically indicated in adults, including pregnant women, because this group is more prone to complication. The preferred is usually oral therapy, but intravenous antivirals are indicated for immuno compromised patient.(14)

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Self -Care and Home Remedies :

The majority of people who get chickenpox recuperate by taking home remedies, letting the illness run its course, and engaging in self-care. Most instances resolve after four to seven days, with no problems.

Home Remedies :

1. Colloidal Oatmeal Baths
2. Baking Soda
3. Calamine lotion
4. Chamomile Tea Compress .(15)

Therapies that may help with symptoms include the following ones:

Painkillers: Acetaminophen, or Tylenol, can help lower a person's high fever and agony during chickenpox. However, it's crucial to adhere to the directions given by the manufacturer and the patient's physician. Aspirin-containing medications shouldn't be used to treat chickenpox because doing so can cause problems.

Ibuprofen should also be avoided since it may raise the risk of strep throat.

Preventing dehydration: One of the most important things to do is to drink lots of fluids, especially water, as dehydration can be a side effect of chickenpox.

Popsicles without added sugar: If you have patches in your mouth, these can help reduce the discomfort associated with it. Eat nothing spicy or salty. Soup, as long as it's not too hot, might be a nice choice if chewing hurts.

Minimize irritation: Although itching can get really bad, you should try not to scratch too much to avoid leaving scars. Oral Benadryl tablets, chilly baths, and topical ointments can all be helpful.(16)

Prevention

For VZV, there is a vaccine available, but there is no cure for chickenpox. For the majority of people, the chickenpox vaccination is currently 90%Trusted Source effective in avoiding the illness. Individuals should keep their distance from those who are known to be infected, refrain from sharing items with them, keep any infected household members away from other people, and clean any surfaces they may have touched.

Vaccination types for chickenpox The VZV vaccination comes in two varieties:

Varivax : This is just the vaccine for chickenpox. Children receive two doses of vaccinations: one at 12 to 15 months of age and the other between 4 and 6 years of age. This vaccine is available to everyone aged 12 months and up. Adolescents and adults are included in this.

ProQuad : This vaccine is a combination that also includes the measles, mumps, and rubella vaccines. Medical professionals refer to it as MMRV. This vaccine is administered to kids on the same schedule as Varivax, however it can only be given to kids who are 12 months old or older. (17)

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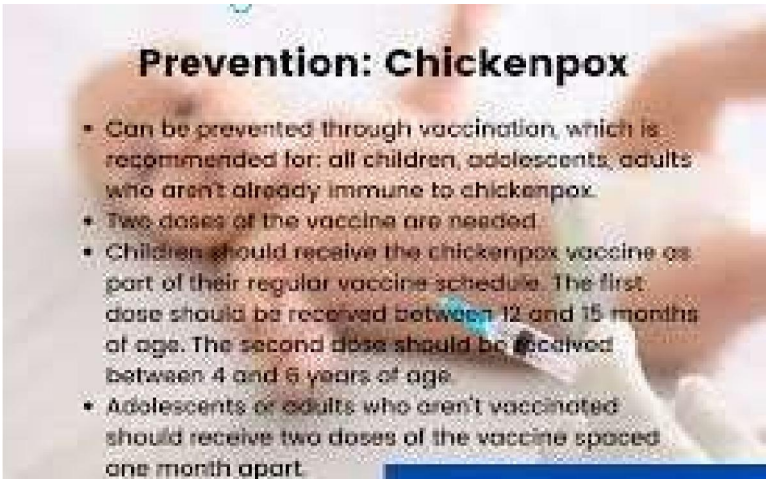

II. CONCLUSION

In this article, we have ventured into the multifaceted realm of chickenpox, or varicella,and examined its various facets, encompassing its clinical manifestations, diagnosis, epidemiology, and public health implications.

Varicella, caused by the varicella-zoster virus (VZV), is a viral infection that has been a subject of extensive medical scrutiny and research due to its widespread prevalence, particularly among children. As we draw this discussion to a close, let us reflect upon the key takeaways and the implications for both clinical practice and public health.Our exploration of chickenpox's clinical manifestations revealed a characteristic progression, from the prodromal phase, marked by non-specific symptoms, to the hallmark vesicular skin rash, which can be profoundly pruritic and, in some cases, accompanied by systemic symptom.

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The diagnostic approach for chickenpox is based mainly on shrewd clinical evaluation, which includes a comprehensive physical examination and a detailed patient history. Given the traditional clinical presentation of the illness, laboratory tests including viral culture, PCR, and serological testing are not always required, but they may be used in specific situations. Accurately identifying instances and promptly initiating appropriate therapy require taking into account differential diagnoses and acknowledging the possibility of unusual situations.

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