



# **Varicella vaccine**















# Increased rate of skin and soft-tissue infections after chickenpox: Is it related to the COVID-19 pandemic?

Several European countries have also reported the experience of an increased number of GAS infections during 2022.<sup>[3,4]</sup>

A literature review revealed a similar report of the increased rate of SSTIs after chickenpox in 2003 in Canada and a relationship between the increased rate of GABHS infections and postchicken pox SSTIs.<sup>[1]</sup>

Young children have experienced less exposure to GAS and are unlikely to possess antibodies against

and during the outbreak of postchickenpox SSTIs in Iran. This increase occurred following a period of reduced incidence of Group A Streptococcus (GAS) infections during the COVID-19 pandemic.

Totally, 75% of our cases led to abscess formation. However, we could not isolate the causative organism of SSTIs despite drainage of the abscess, probably

after varicella–zoster disposing factor for based risk of SSTIs.<sup>[1]</sup> 6.75 ± 3.41 years. The years and prevention 19 pandemic might

**Table 1: The characteristics of the patients**

Case	Sex	Age (years)	Time interval between chickenpox and SSTI (days)	Site of infection	Blood and discharge culture	Complication
1	Male	8	8	Submandibular area	Negative	Abscess formation
2	Male	10	5	Inguinal and scrotum	Negative	Cellulitis
3	Female	1	8	Knee and proximal site of leg	Negative	Abscess formation
4	Female	8	12	Axilla and upper chest	Negative	Abscess formation

SSTI=Skin and soft-tissue infection

# Introduction



- Varicella vaccine is a **live attenuated** preparation
- The product contains **gelatin** and trace amounts of **neomycin**.
- licensed in **1995** by the FDA for use in healthy people **12 months or older** who have not had varicella illness.
- Quadrivalent measles-mumps-rubella varicella (**MMRV**) vaccine was licensed in **2005** by the FDA for use in healthy children **12 months through 12 years** of age.





## Dose and Administration.

- The recommended dose of monovalent or quadrivalent varicella-containing vaccines is **0.5 mL**.
- Administered **subcutaneously** or **intramuscularly**

# Immunogenicity



- Approximately **76% to 85%** of immunized healthy children older than 12 months develop a **humoral immune** response to VZV at levels considered associated with protection after a **single dose** of varicella vaccine.
- Seroresponse rates and cell-mediated immune responses approach **100%** after **2 doses**.







# Effectiveness



- The effectiveness of **1 dose** of varicella vaccine is about **82%** against **any clinical varicella** and **98%** against **severe disease**.
- **Two doses** of vaccine demonstrated **92% to 95%** effectiveness against **any clinical varicella**.

# Simultaneous Administration With Other Vaccines or Antiviral Agents



- Varicella-containing vaccines may be administered **simultaneously** with other childhood immunizations recommended
- If not administered at the same visit ,the interval between administration of a varicella-containing vaccine and **MMR** vaccine should be at least **28 days**.
- Because of susceptibility of vaccine virus to acyclovir, valacyclovir, or **famciclovir**, these antiviral agents usually should be avoided from **1 day before to 21 days after** receipt of a varicella-containing vaccine.







# Adverse Events



- Varicella vaccine is **safe**; reactions generally are **mild** and overall frequency of approximately **5% to 35%**
- Approximately **20% to 25%** of immunized people will experience minor injection site reactions (eg, **pain**, redness, **swelling**).
- In approximately **1% to 3%** of immunized children, a **localized rash** develops, and in an additional **3% to 5%**, a **generalized varicella-like rash** develops.
- These rashes typically consist of 2 to 5 lesions and may be **maculopapular** rather than vesicular; lesions usually appear **5 to 26 days** after immunization.



# Herpes Zoster After Immunization



- Vaccine-strain VZV can cause **herpes zoster** in **immunocompetent** and **immunocompromised** people.
- However, data indicate that the **age-specific risk** of herpes zoster is **lower** among **immunocompetent** children immunized with varicella vaccine than among children who have had natural varicella infection.



# Transmission of Vaccine-Strain VZV



- Vaccine-strain VZV transmission to contacts is **rare**
- In **all** cases, **the immunized person** had a **rash** following vaccine.





# Recommendations for Immunization 12 Months -12 Years



- Both **monovalent** varicella vaccine and **MMRV** have been licensed for use for healthy children **12 months through 12 years** of age.
- **two 0.5-mL doses** of monovalent varicella vaccine or MMRV administered, separated by **at least 3 months**.
- All healthy children should receive the **first dose** of varicella-containing vaccine **at 12 through 15 months of age**.
- The second dose of vaccine is recommended routinely when children are **4 through 6 years of age** but can be administered at an **earlier age**.



# Recommendations for Immunization Children 12 Months Through 12 Years of Age

- If the first dose of varicella-containing vaccine is administered **5 or more days before the first birthday**, the dose does not count toward the 2 doses needed for evidence of immunity to varicella.
- In such a circumstance, the varicella dose should be repeated at **12 through 15 months**, as long as at least **28 days** have elapsed from the invalid dose.





# Recommendations for Immunization ≥13 Years



- Immunocompetent individuals **13 years or older** without evidence of immunity should receive **two 0.5-mL** doses of **monovalent** varicella vaccine, separated by **at least 28 days**.
- For people who previously received **only 1 dose** of varicella vaccine, **a second dose** is necessary.
- **Only monovalent** varicella vaccine is licensed for use in this age group.



# Contraindications and Precautions



- **Intercurrent Illness.** As with other vaccines, varicella vaccine should not be administered to people who have **moderate or severe** illnesses, **with or without fever**.
- Varicella vaccine should not be administered to people who have had an **anaphylactic-type reaction** to any component of the vaccine, including **gelatin and neomycin**.
- Most people with allergy to neomycin have resulting **contact dermatitis**, a reaction that is not a contraindication to immunization.





# Immunization of Immunocompromised Patients



## GENERAL RECOMMENDATIONS

- Varicella vaccine should be administered **≥4 weeks** before initiating immunosuppressive therapy.
- Certain categories of patients (eg, patients with **HIV** infection without **severe immunosuppression** or with a **primary** immune deficiency disorder without **defective T-cell-mediated immunity**, such as **primary complement component deficiency** disorder or **CGD** should receive varicella vaccine.
- Children with **impaired humoral immunity alone** may be immunized.

# HIV INFECTION



- **monovalent** varicella vaccine can be administered to **asymptomatic HIV-infected** children without severe immunosuppression (children **1 through 13 years** of age with a CD4+ **≥15%** and to adolescents **≥14 years** with a CD4+ **≥200** lymphocytes/mm<sup>3</sup>).





# MALIGNANCY



- The interval until **immune reconstruction** varies with the **intensity** and **type** of immunosuppressive therapy, **radiation** therapy, **underlying disease**, and other factors, complicating the ability to make a **definitive recommendation** for an interval after cessation of immunosuppressive therapy.
- Current recommendations are for patients to be vaccinated with varicella vaccine when **in remission** and **at least three months** after **cancer chemotherapy**, with evidence of **restored immunocompetence**.
- In regimens that included **anti-B-cell antibodies**, vaccinations should be delayed **at least 6 months**.





# CHILDREN RECEIVING CORTICOSTEROIDS

- Varicella vaccine should not be administered to people who are receiving **high doses** of systemic corticosteroids (2 mg/kg per day or more of prednisone or its equivalent or 20 mg/day of prednisone or its equivalent) for **14 days** or more.
- The recommended interval between discontinuation of high dose corticosteroid therapy and immunization with varicella vaccine is at least **1 month**.
- Varicella vaccine may be administered to individuals receiving only **inhaled, nasal, or topical steroids**.

# CHILDREN WITH NEPHROTIC SYNDROME



- The results of one small study indicate that 2 doses of varicella vaccine in 29 children between 12 months and 18 years of age generally were **well tolerated** and **immunogenic**, including in children receiving **low-dose, alternate-day** prednisone.







# POTENTIAL CONTACT WITH IMMUNOCOMPROMISED PEOPLE



- Household contacts of immunocompromised people **should be immunized** if they have no evidence of immunity
- Nonimmune family members, close contacts, and health care workers associated with the patient should be immunized before that time.
- **No precautions** are needed following immunization of healthy people **who do not develop a rash**.
- Immunized people in whom a postimmunization rash develops should avoid **direct contact** with an immunocompromised host who lacks evidence of immunity **for the duration of the rash**.



# Pregnancy and Lactation

- Varicella vaccine **should not** be administered to pregnant women, because the possible effects on **fetal development** are unknown, although no cases of **congenital varicella syndrome** or patterns of malformation have been identified.
- Pregnancy should be avoided for **at least 1 month** after immunization.
- A **pregnant mother** or other household member is not a contraindication for **immunization of a child** in the household.
- Varicella vaccine should be administered to **nursing mothers** who lack evidence of immunity.
- no evidence of **excretion** of vaccine strain in **human milk** or of **transmission to infants**.





# Immune Globulin



- Whether (IG) can interfere with varicella vaccine induced immunity is **unknown**, although IG can interfere with immunity induction by **measles** vaccine.
- Pending additional data, varicella vaccine should be withheld for the **same intervals** after receipt of any form of **IG or other blood product** as measles vaccine
- Conversely, IG should be withheld for **at least 2 weeks** after receipt of varicella vaccine.





Product	Minimum interval(months)
<b>HIG</b>	<b>3</b>
<b>IVIG</b>	<b>8</b>
<b>Packed RBC</b>	<b>5</b>
<b>Whole blood</b>	<b>6</b>
<b>Platelet and FFP</b>	<b>7</b>





# Salicylates



- No cases of **Reye syndrome** have been reported following varicella vaccination with **>140 million doses** distributed in the United States.
- However, because use of salicylates during varicella infection is associated with Reye syndrome, salicylates are recommended be avoided for **6 weeks after administration** of varicella vaccine.
- Physicians need to weigh the **theoretical risks** associated with varicella vaccine against the known risks of wild-type virus in children receiving long-term salicylate therapy.

