INFORMATION PAPER

DHA-IHD
4 April 2024

SUBJECT: Chickenpox and the Chickenpox Vaccine

1. Purpose. To describe Chickenpox virus and the Chickenpox vaccine.

2. Facts.

    a. Microbiology.

        (1) The primary infection is caused by the varicella zoster virus (VZV), chickenpox typically occurs during childhood. After the primary infection, VZV stays in the body (in the sensory nerve ganglia) as a latent infection. Reactivation of latent virus later in life produces Shingles (also see Shingles information paper).

    b. Disease.

        (1) About 14-16 days after exposure to varicella or a herpes zoster rash (Shingles), a 1 to 2 day prodrome may begin. During the prodrome infected people, especially adults, develop fever and malaise. The prodrome is then followed by an itchy rash.

        (2) The varicella rash usually begins on the scalp, face or trunk, and then spreads to the extremities. The highest concentration of lesions generally occur on the trunk. Lesions also can occur on mucous membranes of the oropharynx, respiratory tract, vagina, conjunctiva, and the cornea. The lesions are normally 1 to 4 mm in diameter. The vesicles are superficial and delicate and contain clear fluid on an erythematous base. Vesicles may rupture or become purulent before they dry and crust. Successive crops appear over several days, with lesions present in all stages of development at the same time. For example, macular lesions may be observed in the same area of skin as mature vesicles. Healthy children usually have 250 to 500 lesions in 2 to 4 successive crops.

        (3) The clinical course in healthy children is generally mild, fever (up to 102°F) and other systemic symptoms (e.g., malaise, headache) usually resolve within 2 to 4 days after onset of the rash.

        (4) Complications are rare, occurring more frequently in adults, pregnant women, newborns, premature infants and immunocompromised persons. The most common of these complications include secondary bacterial infections of the skin, pneumonia, central nervous system manifestations and very rarely Reye’s syndrome.

    c. Epidemiology.

        (1) The varicella zoster virus is an exclusively human pathogen. Varicella zoster virus is highly contagious and spreads from person to person via airborne respiratory droplets or by direct contact with the fluid inside lesions.

(2) Persons are most contagious from one to two days before rash onset until all the lesions crust over. In temperate areas, varicella has a distinct seasonal fluctuation, with the highest incidence occurring in winter and early spring.

(3) High rates of vaccination coverage in the United States have eliminated discernible seasonality of varicella. Less seasonality is also reported in tropical areas. According to data from the prevaccine era, varicella was endemic in the United States, and virtually all persons acquired varicella by adulthood. The incidence of varicella, as well as varicella-related hospitalizations, has decreased significantly since the implementation of the varicella vaccination program in 1995. Overall, varicella incidence declined an average of 97% from prevaccine years, in all age groups including infants too young for vaccination.

d. Vaccines

(1) There are two, live attenuated VZV-containing vaccines for the prevention of varicella licensed by the Federal Drug Administration (FDA) for use in the United States.

(2) Varivax® produced by Merck is a live, attenuated (weakened) single-antigenl vaccine. Varivax® is licensed for persons 12 months of age and older. It is administered in a 2-dose series. The vaccine is reconstituted with the sterile diluent provided and contains no preservatives.

(3) ProQuad® produced by Merck is a combination vaccine which includes antigens for chickenpox, measles, mumps, and rubella. ProQuad® is licensed for children 12 months through 12 years of age. The vaccine is reconstituted with the sterile diluent provided and contains no preservatives.

(4) The viruses within varicella vaccine are fragile and must be handled carefully. To maintain potency, the freeze-dried vaccine must be protected from light at all times and frozen at an average temperature between -58ºF and +5ºF (−50°C and −15°C) until it is reconstituted for injection. Vaccine may be stored at refrigerator temperature (36° to 46°F, 2° to 8°C) for up to 72 hours prior to reconstitution. Administer the vaccine immediately after reconstitution and discard if not used in 30 minutes. Store the diluent separately at room temperature or in the refrigerator.

e. Clinical Guidance.

(1) Children should receive a single 0.5-mL dose administered intramuscularly or subcutaneously at 12 to 15 months of age with a second dose at 4 through 6 years.

(2) The second dose may be administered earlier than 4 through 6 years of age, if at least 3 months have elapsed following the first dose. A second

dose of varicella vaccine is also recommended for persons older than 6 years of age who have received only one dose.

(3) Based on the Catch-Up schedule, the minimum interval between doses is 3 months for children ages 12 months through 12 years and 4 weeks for people age 13 and older. Persons 13 years of age and older, who do not have evidence of varicella immunity, should receive two 0.5-mL doses of varicella vaccine intramuscularly or subcutaneously separated by at least 4 weeks.

(4) Measles-mumps-rubella (MMR) vaccine and other routine childhood vaccines may be administered simultaneously. If varicella and other live vaccines are not administered at the same visit, separate them by at least 28 days. Prior history of chickenpox is not a contraindication to varicella vaccination.

(5) Adults should receive a 2-dose series 4–8 weeks apart if previously did not receive varicella-containing vaccine and have no evidence of immunity (diagnosis or verification of history of varicella or herpes zoster by a health care provider or laboratory evidence of immunity or disease) If previously received 1 dose varicella-containing vaccine at least 4 weeks after the first dose.

(6) For military accessions, serologic screening is the preferred means of determining for those susceptable to varicella infection and who need immunization. Varicella vaccine will be administered to susceptible trainees and other accessions within two weeks of initial entry training.

(7) Postexposure prophylaxis is recommended for unvaccinated healthy people aged ≥ 12 months without other evidence of immunity, to prevent or modify the disease. Administer the vaccine as soon as possible ≤5 days after exposure to rash, if the exposed person has no contraindications.

f. Precautions and Contraindications.

(1) The following people should not receive the varicella vaccine: people with a severe allergic reaction to a previous dose of varicella vaccine or a varicella vaccine component (Note: If administering varicella combined with MMR vaccine, also check for a history of severe allergic reaction to previous dose of MMR vaccine); women known to be pregnant or attempting to become pregnant (advise women to avoid pregnancy for one month after varicella vaccination); people who are immune suppressed due to disease, treatment, or medication; people who have recently received blood products or immune globulin (3-11 months, depending on the dosage and type of blood product administered). See tables 3-5 and 3-6 in ACIP timing and spacing of immunobiologics; a family history (first degree relatives) of congenital hereditary immunodeficiency, unless the person has been determined to be immunocompetent; blood dyscrasias, leukemia, lymphomas, or malignant neoplasms affecting bone marrow or the lymphatic system;

(2) Precautions for varicella vaccine include moderate or severe acute illness, receipt of specific antiviral drugs 24 hours before vaccination and simultaneous use of aspirin or aspirin-containing products. Unless the parent or caregiver expresses a preference for MMRV vaccine, separate MMR and varicella vaccines should be administered for the first dose for children 12 through 47 months of age. This is also to avoid the slightly increased risk of febrile seizures. Precautions for MMRV only include Thrombocytopenia, need for tuberculosis testing, and personal or family history of seizures of any etiology.

(3) Transmission of varicella vaccine virus has a low occurrence but most common among household contacts. If a vaccinated person develops a rash, it is recommended that close contact with persons who do not have evidence of varicella immunity and who are at high risk of complications of varicella, such as immunocompromised persons and infants, be avoided until the rash has resolved.

g. Adverse Reactions/Events.

(1) The most reported adverse reactions following varicella vaccination are local reactions, such as pain, soreness, erythema, and swelling. Other reactions may include a varicella-like rash at injection site or generalized rashes may occur within 3 weeks and are mainly maculopapular. Systemic reactions, like fever, are uncommon.

h. DoD Policy.

(1) Use varicella vaccine in accordance with recommendations of the Advisory Committee on Immunization Practices (ACIP). Unless seroimmune, administer varicella vaccine per ACIP guidelines to military personnel at initial entry training or upon deployment.

3. References

a. Centers for Disease Control and Prevention. Prevention of Varicella. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2007;56(No. RR-4). https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/varicella.html

b. Centers for Disease Control and Prevention, Use of Combination Measles, Mumps, Rubella and Varicella Vaccine Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2010;59(No. RR03) https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5903a1.htm

c. Centers for Disease Control and Prevention, Varicella, The Pink Book: Course Textbook - 14th Edition (2021, August). Retrieved from https://www.cdc.gov/vaccines/pubs/pinkbook/varicella.html#contraindications-precautions-vaccination

d. Centers for Disease Control and Prevention (CDC), Chickenpox (Varicella). (n.d.).

Retrieved from https://www.cdc.gov/chickenpox/hcp/index.html

e. Multiple resources (e.g., product insert, Vaccine Information Statements) assembled by Immunization Healthcare Division: www.health.mil/chickenpox

f. Centers for Disease Control and Prevention (CDC), Vaccine recommendations and guidelines of the ACIP, Timing and Spacing of Immunobiologics. Tables 3-5 and 3-6 (Updated 2023, August). Retrieved from https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html

g. Department of the Army, the Navy, The Air Force and the Coast Guard. (2013). Immunizations and Chemoprophylaxis for the Prevention of Infectious Diseases (AR 40-562, BUMEDINST 6230.15B, AFI 48-440_IP, CG COMDTINST M6230.4G). https://www.health.mil/Reference-Center/Policies/2013/10/07/Immunizations-and-Chemoprophylaxis-for-the-Prevention-of-Infectious-Diseases

h. DoD Instruction 6205.02 (2019, change 1 2023). DoD Immunization Program. https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/620502p.pdf

Central Region Vaccine Safety Hub
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