Feature Article: A tale of two diseases … and one virus

One disease strikes most of its victims between the age of 6 and 10. The other mostly affects or older. But one virus links the two together — the varicella-zoster virus (VZV).

The chickenpox story

For many years, chickenpox (varicella) was not viewed as a dangerous disease, but simply as a childhood rite of passage. However, while most people fully recover from chickenpox, it can be a painful experience that is likely to affect all susceptible people in the house once one person becomes ill. Also, for some, it can be serious — and even deadly.

Chickenpox is caused by the varicella-zoster virus (VZV), and its symptoms include an itchy rash first appearing on the head and trunk before spreading to the rest of the body. Typically, 300-500 fluid-filled blisters develop that will eventually break and crust over. Other symptoms include fever, aches, fatigue, headache, vomiting and diarrhea. The disease typically lasts about a week, and those infected are no longer contagious once their lesions have crusted. Chickenpox is transmitted in one of three ways: by respiratory droplets that are expelled during coughing or sneezing, by physical contact with fluid from broken blisters, or via airborne virus particles from blisters. In a house with five people who have never had chickenpox or been vaccinated against the disease, four or five of those susceptible people are likely to also get infected with chickenpox.

About 1 out of 1,000 infected with chickenpox will experience severe complications like pneumonia or encephalitis (inflammation of the brain). Blisters can also become infected with bacteria normally present on the skin leading to further complications. About one in 50 babies born to women infected during pregnancy will be born with complications, such as low birth weight, scarring of the skin, or abnormal development of their arms, legs, brain or eyes.

The shingles story

One’s experience with chickenpox doesn’t end when the itching stops. Rather, once the acute infection stage is finished, the varicella zoster virus lives silently in the body’s nervous system for many years. Shingles is the result of a reactivation of that virus, and often occurs as a result of weakened immunity, such as from advanced aging, other viruses (such as the AIDS virus) or use of immune suppressive drugs, such as for cancer treatment or other conditions.

Symptoms of shingles include a rash along a nerve path and severe pain. The pain can be debilitating and last for months or even years disrupting performance of basic tasks like eating or bathing. About 15 out of every 100 people experience an occurrence in the nerves around the eyes leading to reduced vision or blindness. A person cannot “catch” shingles from another person, since only people who have had chickenpox can get shingles. However, people with shingles rash can spread the chickenpox virus to those without immunity through direct contact with the rash. Once the shingles rash has dissipated or crusted over, a person with shingles is no longer contagious — even if he still has nerve pain or other symptoms.

The vaccine virus

Since chickenpox and shingles are caused by the same virus, the vaccines can be made using the same virus as well. However, the shingles vaccine is a more concentrated version of the chickenpox vaccine. In fact, the shingles vaccine, which is recommended for adults 60 years of age and older, contains 14 times more vaccine virus than the chickenpox vaccine. This larger quantity is needed to appropriately boost the immunologic memory response in the aging immune systems of people recommended to get the vaccine. Because the chickenpox and shingles vaccine contain vastly different quantities of vaccine virus, they cannot be used interchangeably. The shingles vaccine protects more than half of recipients from getting the disease and about two-thirds of people from the severe pain associated with shingles.
Ask the VEC: Is adult chickenpox vaccination necessary?

Q. If I am an adult who never had chickenpox or the chickenpox vaccine, should I get it now?

A. Yes. Chickenpox is much more likely to cause severe disease in adults than in children, so it’s important to get the vaccine. In fact, adults are 10 times more likely than children to be hospitalized with severe complications related to chickenpox, such as pneumonia and encephalitis (inflammation of the brain).

Children, adolescents and young adults that received only one dose should get a second dose, and previously unimmunized or unexposed adolescents or adults should get two doses separated by four to eight weeks between doses.

Trivia Answer:
The correct answer is the chickenpox and shingles vaccines. The main difference between the two vaccines is that the shingles vaccine contains 14 times more varicella virus than the chickenpox vaccine in order to provide sufficient immunity in people 60 years of age and older. Go to vaccine.chop.edu/trivia to play Just the Vax, the Vaccine Education Center’s trivia game, where you can find this question and others like it.

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The chickenpox vaccine is typically given as a two-shot series with the first dose between 12 and 15 months of age and the second dose between 4 and 6 years of age. Known side effects of the chickenpox vaccine include minor concerns like pain or redness at the injection site, a low-grade fever or rash. Side effects of the shingles vaccine include pain or redness at the injection site, headache or fever. Prior to the availability of the chickenpox vaccine in the U.S., about 50 to 100 deaths and more than 10,000 hospitalizations were caused by chickenpox every year.

Like natural varicella-zoster virus, the varicella vaccine virus also lives in the nervous system. However, the vaccine virus is significantly weaker than natural varicella-zoster virus. So while someone who receives the chickenpox vaccine is still able to get shingles later in life, the vaccine virus is much less likely to reawaken and cause shingles. If it does, the disease tends to be less severe.

Did You Know? … 1 or 2 per week

Prior to the introduction of the chickenpox vaccine in the United States, one or two children died every week from chickenpox or complications of the disease. However, the inclusion of the vaccine into the recommended childhood immunization schedule has led to fewer than 20 deaths and less than 1,700 hospitalizations each year.

While the vaccine has been successful in reducing death and hospitalization, unfortunately, only about nine out of 10 eligible people are vaccinated, so the disease still sickens and kills people in the U.S. every year. For example, in the U.S. from 2009-12, about 64,000 people got chickenpox and 45 people died. While the numbers continue to decline, there is still work to be done.

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