

# Varicella Zoster Infection in Adults: A Preventable Disease

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**V**aricella zoster virus infection is responsible for two major distinct clinical conditions: primary VZV infection causes varicella (i.e., chickenpox), and reactivation of the virus causes herpes zoster (i.e., shingles). Varicella is a common pediatric infection with a usually benign course and outcome. Primary varicella in adults is a rare disease, but it has a high rate of complications with pneumonia being the most common, as described in this issue of *IMAJ* by Avnon et al. [1]. Varicella pneumonia often requires mechanical ventilation and carries an overall mortality rate of 10%–30% despite appropriate antiviral therapy [2,3]. Adults with varicella are 25 times more likely to develop severe disease than children [4]. Known risk factors for varicella pneumonia in adults are pregnancy [5,6], smoking [7,8], chronic lung disease [7,9], and an immunocompromised state [10,11]. In Israel, it is estimated that about 2% of the adult population lacks specific immunoglobulin G and are therefore susceptible to varicella infection [12].

Varicella zoster live attenuated vaccine has been available in the United States since 1995, and was recommended by the Advisory Committee on Immunization Practices for all persons aged  $\geq 12$  months who lack evidence of immunity [13]. The vaccine has been available in Israel since 2000.

Nevertheless, the rate of vaccination was estimated to be only about 30% [14] until recently, when it was included in the routine immunization schedule (January 2009).

In this issue of *IMAJ* Avnon and co-authors [1] report 21 cases of varicella pneumonia in adult patients, all of whom were unimmunized. Fifty-two percent required intensive care treatment; fortunately, there were no fatalities.

For this preventable illness, there is an effective vaccine that is highly protective against varicella and especially protective against severe disease [15]. The recommended adult immunization schedule in the USA suggests that all adults without evidence of immunity to varicella should receive two doses of varicella vaccine if not previously vaccinated, unless there is a contraindication [16]. It is important to immunize varicella-susceptible adults because as the study by Avnon and team illustrates [1], adults are at high risk to develop severe disease.

A subpopulation that requires special attention is pregnant women. Not only are they at increased risk for developing severe disease, but they are also at risk for fetal malformations if disease occurs early in pregnancy and for severe disease in the newborn if the mother becomes infected perinatally. Since live attenuated vaccines are not approved in pregnancy, it is recommended that susceptible pregnant women who were exposed to varicella receive varicella zoster immunoglobulin, which necessitates emergency room visits and administration of an expensive treatment. Thus, vaccination should be offered to every susceptible woman of childbearing age to prevent them contracting the

disease, a disease that causes great anxiety to pregnant women and imposes a substantial burden on the health care system. Other special subpopulations that are at increased risk include hospital personnel, persons in close contact with individuals at high risk for severe disease, child care employees, and young adults living in crowded conditions.

One of the problems with adult vaccination is to determine who is susceptible to the disease. Adults who indicate that they have had varicella in the past are likely to be immune [15]. In contrast, adults with no previous history of varicella may or may not be susceptible. Commercial enzyme-linked immunosorbent assay kits can be used for identifying individuals susceptible to varicella. Immunization programs are usually directed at infants because this group is easily reachable for vaccination. Immunizing adults is more challenging. Programs for vaccination of adults in the workplace would seem to be the best approach. Such programs, e.g., with influenza vaccine, have been used with some success. The difficulties encountered with immunizing adults are another reason to emphasize the importance of immunizing children. Both personal immunity and herd immunity to varicella are important and programs to protect individuals at high risk for susceptibility to varicella should be instituted.

After primary infection with VZV, the virus remains latent in the dorsal root ganglia and can reactivate to cause herpes zoster, a localized painful cutaneous eruption, usually distributed across one dermatome. It occurs most frequently with waxing immunity among older adults or when cell-mediated immunity

VZV = varicella zoster virus

is compromised. Approximately one in three persons will develop zoster during their lifetime. A common complication of zoster is post-herpetic neuralgia, a chronic pain that can last months or even years. Other complications include sight-threatening eye involvement, bacterial super-infections, and disfiguring facial scarring.

In May 2006, a live attenuated vaccine for prevention of zoster was licensed in the United States for use in persons  $\geq 60$  years old. It is a preparation of the same strain (Oka strain) used in the varicella vaccine but is 14 times more potent. The efficacy of zoster vaccine was evaluated in a double-blind randomized placebo-controlled trial involving  $> 38,000$  adults aged  $\geq 60$  years with a mean follow-up of 3.1 years. The vaccine reduced the risk for developing zoster by 51%, and it was partially efficacious at reducing both the severity and duration of pain and also at preventing post-herpetic neuralgia among those developing zoster [17].

In the U.S. zoster vaccine is recommended for all persons  $\geq 60$  years who have no contraindications. Unfortunately, it is not yet licensed in Israel, but when approval for routine use in Israel is given, this vaccine will enable us to decrease the burden of this disease and its complications among persons at

high levels of risk. Routine immunization for varicella vaccine in children and susceptible adults, and zoster vaccine for older adults with a history of varicella may eradicate varicella zoster infection and its complications in both children and adults.

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