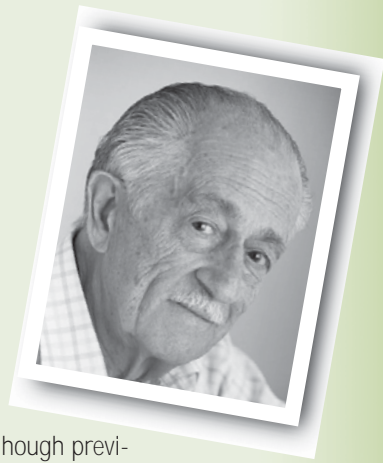


CASE STUDY

A 78-Year-Old Man With a History of PHN



Presentation

David is a 78-year-old married retiree who visits a new primary care clinician for an annual check-up. Although previously a heavy smoker, he quit 15 years ago. David's active medical problems include chronic bronchitis, ischemic heart disease, and congestive heart failure. All of these conditions are adequately controlled with medication, which includes a twice-daily inhalation of 360 µg of budesonide. The patient also reports that he had a myocardial infarction about 3 years ago. While taking David's medical history, the clinician is considering preventive measures that would be appropriate for the patient, including the herpes zoster vaccine.

Clinical Decision Point

Is the patient an appropriate candidate for the zoster vaccine?

- Yes. He is an appropriate candidate for the zoster vaccine
- No. He is not an appropriate candidate for the zoster vaccine

Comment

The Shingles Prevention Study, a pivotal trial that led to US Food and Drug Administration (FDA) approval of the herpes zoster vaccine, demonstrated that the vaccine reduces the incidence of zoster and postherpetic neuralgia (PHN), as well as the severity of zoster infection.¹ In this study, adults ≥ 60 years of age ($N=38,546$) were randomly assigned to receive vaccine or placebo and were followed for a median of 3.12 years. The primary outcome measure in this trial was the herpes zoster burden of illness, a severity-by-duration measure of all pain and discomfort experienced by all study participants, regardless of whether they developed zoster; thus, the burden of illness indirectly incorporated incidence. The secondary outcome measure was the incidence of clinically significant PHN, defined as pain that persisted or appeared ≥ 90 days after rash onset and was scored ≥ 3 on the Zoster Brief Pain Inventory scale.¹

The zoster vaccine significantly reduced the burden of zoster illness by 61.1% in the vaccine recipient group ($P<.001$) (Figure 1).¹ The reduction in burden of illness

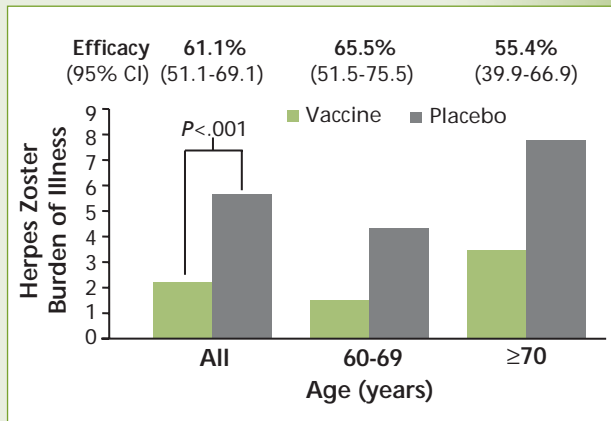


Figure 1. Vaccine efficacy in herpes zoster. CI = confidence interval. Oxman MN et al.¹

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reflects a decrease in both the severity and incidence of herpes zoster. The incidence of zoster infection was reduced by 51.3% (Figure 2); a greater reduction was seen in the younger, 60- to 69-year-old group (63.9%) vs the older group (37.6%; $P < .001$). The average duration of zoster infection declined from 24 days to 21 days and was accompanied by a significant decrease in average pain severity scores, with adults ≥ 70 years of age demonstrating the greatest reduction. The vaccine also significantly reduced the incidence of PHN by 66.5% ($P < .001$). In a time-to-event analysis, the cumulative incidence of PHN was significantly lower in the vaccine recipient group than in the placebo group ($P < .001$).¹

In an immunogenicity substudy of the Shingles Prevention Study ($n=1395$), antibodies to varicella-zoster virus (VZV) and cell-mediated immunity (CMI) were measured 6 weeks after vaccination and annually for 3 years. Immune response was greater in vaccine recipients aged 60 to 69 years than in those ≥ 70 years of age. Higher antibody concentrations and more robust CMI were both associated with a decrease in the likelihood of developing herpes zoster.²

The zoster vaccine was generally safe and well tolerated during the Shingles Prevention Study. In the entire study population, the incidence of death (4.1%) and serious adverse events (1.4%) during the 42 days postvaccination were identical in the vaccine and placebo groups. In the adverse event substudy ($n=6616$), adverse events were more common in the vaccine group, largely due to increased incidence of injection-site reactions among patients receiving the vaccine. Indeed, 48.3% of vaccine recipients vs 16.6% of placebo recipients experienced ≥ 1 vaccine-site reaction(s), the most common being erythema, pain or tenderness, and swelling (Table 1).¹ Serious adverse events were also slightly—but significantly—more frequent in the vaccine group than in the placebo group (1.9% vs 1.3%, respectively; $P < .05$). However, a post hoc review failed to find any clinically meaningful differences in the incidence of adverse events between the groups with regard to the timing, form, or pathophysiology of the events.¹

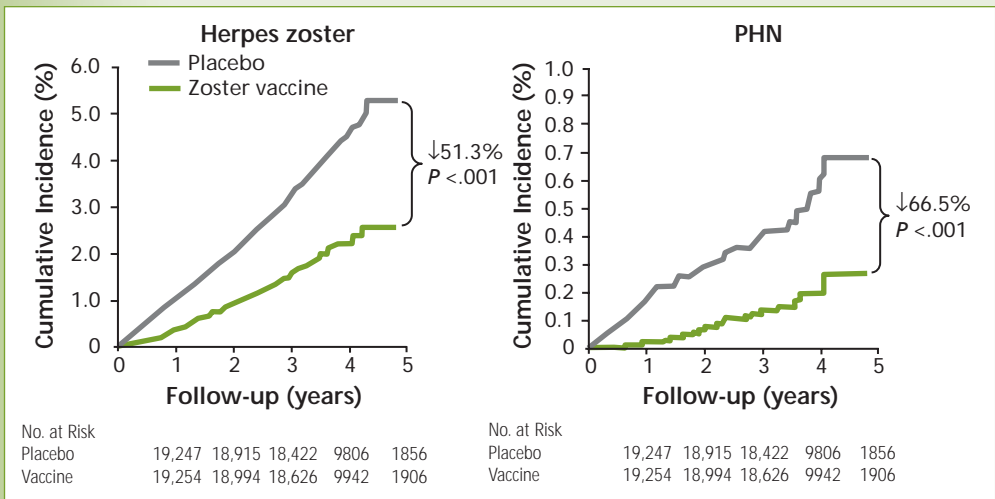


Figure 2. Herpes zoster vaccination reduces incidence of herpes zoster and PHN. Oxman MN et al.¹ Copyright © 2005 Massachusetts Medical Society. All rights reserved.

Table 1. Adverse Events Among All Subjects

Event*	Vaccine Group (n=19,270)	Placebo Group (n=19,276)	Difference in Risk (95% CI)
Death	14 (0.1%)	16 (0.1%)	-0.01 (-0.1% to 0.1%)
≥1 Serious adverse events	255 (1.4%)	254 (1.4%)	0.01 (-0.2% to 0.3%)
Varicella-like rash at injection site	20 (0.1%)	7 (0.04%)	0.07 (0.02% to 0.13%)
Varicella-like rash not at injection site	18 (0.1%)	14 (0.1%)	0.02 (-0.04% to 0.09%)
Herpes zoster-like rash	17 (0.1%)	36 (0.2%)	-0.10 (-0.18% to -0.03%)
Rash unrelated to herpes zoster	595 (3.2%)	620 (3.3%)	-0.13 (-0.49% to 0.23%)
Confirmed cases of herpes zoster	7 (<0.1%)	24 (0.1%)	-0.09 (-0.16% to -0.03%)

*Day of vaccination to day 42.
Oxman MN et al.¹

Decision: Yes. The patient is an appropriate candidate to receive the herpes zoster vaccine.

In May 2006 the FDA approved the live attenuated herpes zoster vaccine for the prevention of herpes zoster in individuals ≥60 years of age. It is not indicated for the treatment of zoster. Additionally, the herpes zoster vaccine is not indicated for the treatment or prevention of PHN. Contraindications include administration of the vaccine to any person who has experienced an anaphylactic reaction to neomycin, gelatin, or any other component of the vaccine; any individual with a history of primary or acquired immune deficiency (including leukemia, lymphomas of any type, other malignant neoplasms affecting the bone marrow or lymphatic system, AIDS or any clinical manifestations of HIV); any person currently on immunosuppressive therapy; as well as pregnant females. The vaccine should also be deferred in any patient with active tuberculosis, serious current illness, or body temperature >38.5°C.³

Before the clinician has time to open the discussion of the zoster vaccine, the patient interjects—"before he forgets"—that he needs to make sure he gets his influenza vaccine today or his wife will be angry with him. The clinician replies he will get to that in a moment, and raises the topic of the zoster vaccine. The patient then tells the clinician that he had acute herpes zoster that led to PHN 9 years ago. He notes that the treatment for PHN was not effective, and the associated pain was excruciating. The patient has heard about the vaccine, but figured that he was not a candidate, since he had a previous episode of herpes zoster.

CASE STUDY

A 78-Year-Old Man With a History of PHN

Clinical Decision Point

With this new information regarding the patient's history, should the clinician proceed with his plan to administer the zoster vaccine *and* the influenza vaccine during this visit?

- No. Administer the influenza vaccine today, and then wait at least 2 months to administer the zoster vaccine
- No. Do not administer either vaccine, because the patient is currently using inhaled corticosteroids, which could lead to unwanted complications
- No. Do not administer the zoster vaccine, because the patient had shingles 9 years ago
- Yes. Administer both the influenza and zoster vaccines concomitantly during today's visit

Comment

In May 2008, the Advisory Committee on Immunization Practices (ACIP), which consists of 15 experts in fields associated with immunization who have been selected by the Secretary of the US Department of Health and Human Services to provide advice and guidance to the Secretary, the Assistant Secretary for Health, and the Centers for Disease Control and Prevention (CDC) on the control of vaccine-preventable diseases, published its final recommendation for the herpes zoster vaccine. The *Morbidity and Mortality Weekly Report* published recommendations, stating: All persons ≥ 60 years of age who have no contraindications, including those who report a previous episode of herpes zoster and those with chronic medical conditions (eg, chronic renal failure, diabetes mellitus, rheumatoid arthritis, and chronic obstructive pulmonary disease), should receive the herpes zoster vaccine.⁴

The ACIP recommendations of May 2008 provide further guidance regarding the contraindications included in the original prescribing information for the zoster vaccine. According to these recommendations, administering the trivalent inactivated influenza and zoster vaccines concomitantly does not affect the immune response of either vaccine (Figure 3).^{4,5} In addition, coadministration with other indicated inactivated vaccines, such as PPV, Tdap, or

(continued on page 70)

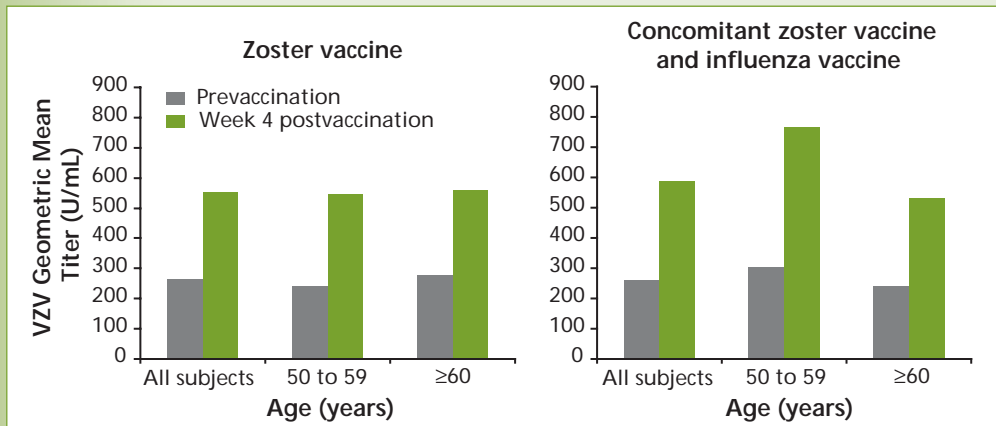


Figure 3. VZV antibody responses alone versus concomitant use of zoster vaccine and influenza vaccine. Kerzner B et al.⁵

Preventing Herpes Zoster and Postherpetic Neuralgia: Are Your Patients Protected?

What Is Herpes Zoster?

Herpes zoster—also called shingles—is an acute, localized infection with VZV in the dorsal nerve root ganglia that causes a painful, blistering rash.¹⁻³ Herpes zoster affects approximately 1 million individuals in the United States every year,^{2,4} and up to 20% of Americans will develop this disease during their lifetime.^{1,4} Incidence and severity of herpes zoster increase sharply with advancing age, which makes it a significant cause of morbidity in older adults. Accordingly, nearly half of affected patients are ≥60 years of age.^{1-3,5,6}

Herpes zoster, the clinical manifestation of reactivated VZV—the same virus that causes varicella (chickenpox)—occurs in patients who have had a primary VZV infection.^{3,6-8} Although many patients do not recall having had chickenpox in the past, >99% of adults aged 40 to 49 years have antibodies to VZV.⁹ VZV reactivation, which results in clinical herpes zoster, typically arises when VZV-specific CMI declines with age (Figure A).^{7,8,10,11} HIV/AIDS, hematologic malignancy and other neoplastic diseases, bone marrow or organ transplantation, immunosuppressive therapy (such as corticosteroids or chemotherapy), psychological stress, physical trauma, and family history are other causes of a weakened immune system associated with herpes zoster infection.^{1,6,8,12-16} Diagnosis of herpes zoster is based primarily on clinical findings, specifically the characteristic location and appearance of the skin eruption in association with localized

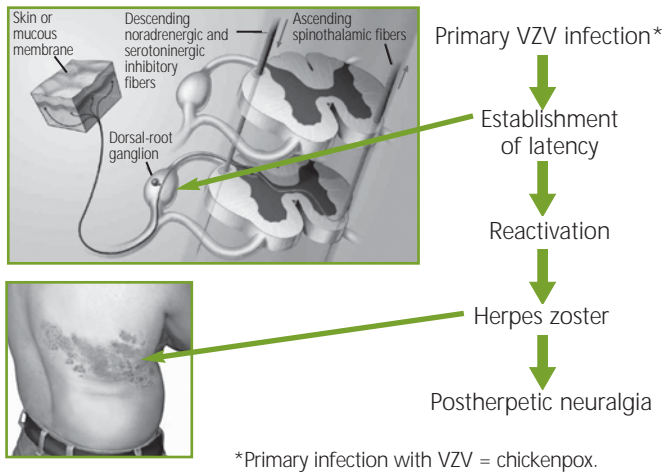


Figure A. Natural history of VZV. Kost RG et al¹⁰; National Library of Medicine.¹¹ Copyright © 1996 Massachusetts Medical Society. All rights reserved.

Table A. Complications of Herpes Zoster

Neurologic	Ophthalmic
<ul style="list-style-type: none"> ➤ PHN ➤ Motor neuropathy ➤ Cranial palsy ➤ Encephalitis ➤ Transverse myelitis ➤ Postzoster stroke syndromes 	<ul style="list-style-type: none"> ➤ Stromal keratitis ➤ Iritis ➤ Retinitis ➤ Visual impairment ➤ Episcleritis ➤ Keratopathy
Cutaneous	Visceral
<ul style="list-style-type: none"> ➤ Bacterial superinfection ➤ Scarring ➤ Disfigurement 	<ul style="list-style-type: none"> ➤ Pneumonitis ➤ Hepatitis ➤ Encephalitis

Gnann JW Jr et al¹; Arvin AM⁸; Moriuchi H et al.²⁰

pain (Figure A).^{10,11,17} However, in some patients, the presentation of herpes zoster can be atypical and may require additional testing. This is particularly true in immunocompromised patients.

The painful, vesicular rash associated with herpes zoster is often preceded by a prodrome associated with localized pain, unpleasant

Preventing Herpes Zoster and Postherpetic Neuralgia: Are Your Patients Protected?

sensation, itching, and malaise.^{6,18} Pain, usually the most distressing symptom, often precedes the onset of rash.^{4,18} The acute pain is moderate to severe in most patients.¹⁹ The rash typically progresses from vesicles to crusted lesions that eventually heal within 2 to 4 weeks of onset^{1,6}; however, some individuals continue to experience pain in the dermatome previously associated with the rash, a condition known as PHN.¹ Other potential complications of acute herpes

zoster include herpes zoster ophthalmicus and subsequent visual impairment,⁶ which occur in about 5% to 10% of patients, as well as cranial and peripheral nerve palsies (Table A).^{1,2,8,20}

PHN, the most common complication of herpes zoster, affects approximately 22% of all patients with the disorder.²¹ Constant burning pain is typical, but PHN can also include allodynia, hyperalgesia, and dysesthesia.⁶ Both the incidence and duration of PHN are directly correlated with the patient's age. With every 1-year increase in age, the prevalence of PHN pain at 30 and 60 days increases by 9% and 12%, respectively (Figure B).^{1,22} Besides increasing age, risk factors for PHN include severity of acute pain, severity of acute rash (>50 lesions), and a painful prodrome.²³ PHN can last from 4 weeks to more than 10 years.⁸

Antiviral medications—such as acyclovir,

famciclovir, and valacyclovir—are safe, well tolerated, and effective in reducing the severity and duration of acute herpes zoster when given within 72 hours of rash onset (Figure C).^{24,25} Patients with mild-to-moderate pain may respond to over-the-counter analgesics. A combination of corticosteroids and antiviral therapy may further reduce acute zoster pain, perception of the pain, and use of analgesic agents.²⁶ However,

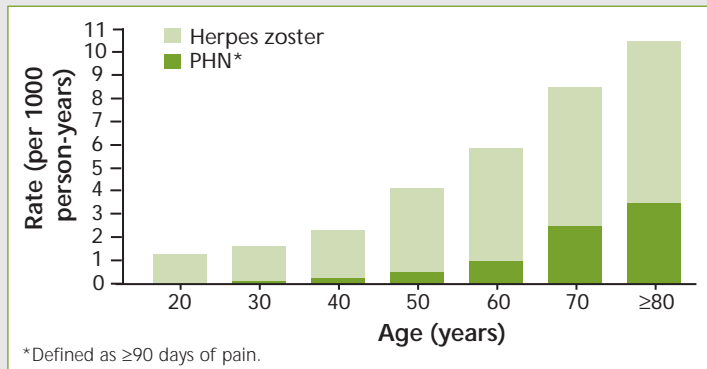
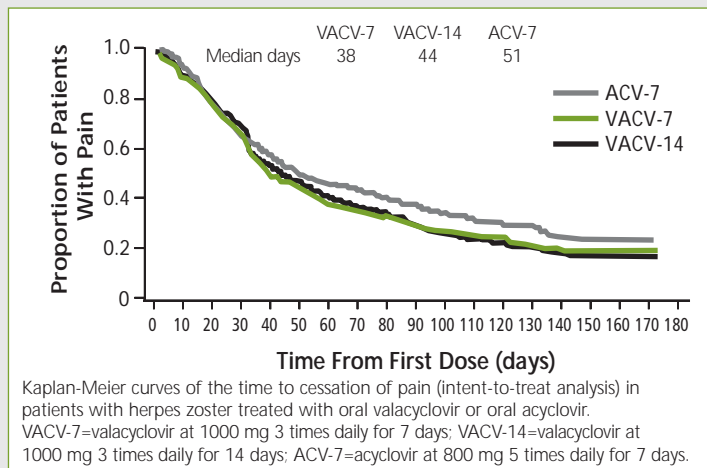


Figure B. Rate of herpes zoster and PHN by age in the United States. Centers for Disease Control and Prevention.²²



Kaplan-Meier curves of the time to cessation of pain (intent-to-treat analysis) in patients with herpes zoster treated with oral valacyclovir or oral acyclovir. VACV-7=valacyclovir at 1000 mg 3 times daily for 7 days; VACV-14=valacyclovir at 1000 mg 3 times daily for 14 days; ACV-7=acyclovir at 800 mg 5 times daily for 7 days.

Figure C. Valacyclovir compared with acyclovir for improved therapy for herpes zoster in immunocompetent adults. Beutner KR et al.²⁵ Reproduced with permission from American Society for Microbiology.

because of the increase in adverse events seen with corticosteroid therapy, its use is not routinely recommended.²⁶ Since herpes zoster affects approximately 1 million individuals in the United States every year^{2,4} and up to 20% of Americans will develop this disease during their lifetime,^{1,4} a means of prevention would offer important medical and economic benefits. In May 2006 a vaccine was approved for the prevention of herpes zoster, thereby providing clinicians the opportunity to protect their patients from the virus and the most common complication, PHN.

References

- Gnann JW Jr, Whitley RJ. Clinical practice: herpes zoster. *N Engl J Med*. 2002;347:340-346.
- Insigna RP, Itzler RF, Pellissier JM, Saddier P, Nikas AA. The incidence of herpes zoster in a United States administrative database. *J Gen Intern Med*. 2005;20:748-753.
- Oxman MN, Levin MJ, Johnson GR, et al. A vaccine to prevent herpes zoster and postherpetic neuralgia in older adults. *N Engl J Med*. 2005;352:2271-2284.
- Wood MJ, Easterbrook P. Shingles, scourge of the elderly. The acute illness. In: Sacks SL, Straus SE, Whitley RJ, Griffiths PD, eds. *Clinical management of herpes viruses*. Washington, DC: IOS Press; 1995:193-209.
- Hope-Simpson R. The nature of herpes zoster: a long-term study and a new hypothesis. *Proc R Soc Med*. 1965;58:9-20.
- Johnson RW, Whitton TL. Management of herpes zoster (shingles) and postherpetic neuralgia. *Expert Opin Pharmacother*. 2004;5:551-559.
- Levin MJ, Oxman MN, Zhang JH, et al; and the Veterans Affairs Cooperative Shingles Prevention Study Investigators. Varicella-zoster virus-specific immune responses in elderly recipients of a herpes zoster vaccine. *J Infect Dis*. 2008;197:825-835.
- Arvin AM. Varicella-zoster virus. *Clin Microbiol Rev*. 1996;9:361-381.
- Kilgore PE, Kruszon-Moran D, Seward JF, et al. Varicella in Americans from NHANES III: implications for control through routine immunization. *J Med Virol*. 2003;70(suppl):S111-S118.
- Kost RG, Straus SE. Postherpetic neuralgia—pathogenesis, treatment, and prevention. *N Engl J Med*. 1996;335:32-42.
- National Library of Medicine. Medical encyclopedia: shingles. MedlinePlus Web site. <http://www.nlm.nih.gov/medlineplus/ency/imagepages/19687.htm>. Accessed October 24, 2008.
- Arvin A. Aging, immunity, and the varicella-zoster virus. *N Engl J Med*. 2005;352:2266-2267.
- Thomas SL, Wheeler JG, Hall AJ. Case-control study of the effect of mechanical trauma on the risk of herpes zoster. *BMJ*. 2004;328:439-440.
- Schmader K, Studenski S, MacMillan J, Grufferman S, Cohen HJ. Are stressful life events risk factors for herpes zoster? *J Am Geriatr Soc*. 1990;38:1188-1194.
- Kawasaki H, Takayama J, Ohira M. Herpes zoster infection after bone marrow transplantation in children. *J Pediatr*. 1996;128:353-356.
- Hicks LD, Cook-Norris RH, Mendoza N, Madkan V, Arora A, Tyring SK. Family history as a risk factor for herpes zoster. *Arch Dermatol*. 2008;144:603-608.
- Wareham DW, Breuer J. Herpes zoster. *BMJ*. 2007;334:1211-1215.
- Goh C-L, Khoo L. A retrospective study of the clinical presentation and outcome of herpes zoster in a tertiary dermatology outpatient referral clinic. *Int J Dermatol*. 1997;36:667-672.
- Katz J, Cooper EM, Walther RR, Sweeney EW, Dworkin RH. Acute pain in herpes zoster and its impact on health-related quality of life. *Clin Infect Dis*. 2004;39:342-348.
- Moriuchi H, Rodriguez W. Role of varicella-zoster virus in stroke syndromes. *Pediatr Infect Dis J*. 2000;19:648-653.
- Dworkin RH, Portenoy RK. Pain and its persistence in herpes zoster. *Pain*. 1996;67:241-251.
- Centers for Disease Control and Prevention. Prevention of herpes zoster: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2008;57(RR-5):1-30.
- Jung BF, Johnson RW, Griffin DR, Dworkin RH. Risk factors for postherpetic neuralgia in patients with herpes zoster. *Neurology*. 2004;62:1545-1551.
- Nikkels AF, Piérard GE. Oral antivirals revisited in the treatment of herpes zoster: what do they accomplish? *Am J Clin Dermatol*. 2002;3:591-598.
- Beutner KR, Friedman DJ, Forszpaniak C, Andersen PL, Wood MJ. Valaciclovir compared with acyclovir for improved therapy for herpes zoster in immunocompetent adults. *Antimicrob Agents Chemother*. 1995;39:1546-1553.
- Wood MJ, Johnson RW, McKendrick MW, Taylor J, Mandal BK, Crooks J. A randomized trial of acyclovir for 7 days or 21 days with and without prednisolone for treatment of acute herpes zoster. *N Engl J Med*. 1994;330:896-900.

CASE STUDY

A 78-Year-Old Man With a History of PHN

Td, during the same visit does not increase the rate of adverse events⁴; however, the vaccines should be administered at separate anatomic sites in different syringes.⁴

Decision: Yes. Administer both the influenza and zoster vaccines concomitantly during today's visit.

Although this patient had herpes zoster and PHN in the past, the zoster vaccine may still be administered. The ACIP recommendations state that all persons ≥ 60 years of age who have no contraindications, including those who report a previous episode of herpes zoster and those with chronic medical conditions (eg, chronic renal failure, diabetes mellitus, rheumatoid arthritis, and chronic obstructive pulmonary disease), should receive the herpes zoster vaccine.⁴ Although corticosteroids can cause immunosuppression, this is a concern only at high doses. The ACIP clarified the contraindications for corticosteroid use by advising that only patients receiving a dose of ≥ 20 mg/d of prednisone or the equivalent for ≥ 2 weeks should not receive the vaccine for at least 1 month after discontinuation of therapy. Doses below this range, as well as topical (eg, skin, nasal, inhaled) formulations or intraarticular, bursal, or tendon injections, are not considered sufficiently immunosuppressive to raise concern.⁴ Based on the ACIP recommendations, it would be prudent to administer both vaccines during this visit.

CASE STUDY

A 59-Year-Old Woman Exposed to Shingles at Work



Presentation

Carla is a 59-year-old woman who arrives at your office for a routine check-up. She is an unmarried, successful corporate attorney with no children. Active medical problems include hypertension and hyperlipidemia, both of which are well controlled with pharmacotherapy. Carla expresses concern that 2 of her coworkers had shingles in the past few months, and both cases were associated with severe pain and protracted absences from work. She is worried about catching shingles at work and requests the herpes zoster vaccine. She does not remember whether or not she ever had chickenpox, and she has never had acute herpes zoster.

Clinical Decision Point

Should this patient receive the zoster vaccine?

- No. Zoster vaccination is not safe in VZV-seronegative patients
- No. The zoster vaccine is approved for patients ≥ 60 years of age
- Yes. Zoster vaccine is safe in VZV-seronegative patients
- Yes, but VZV serologic testing is recommended prior to vaccination

Comment

While much less contagious than chickenpox, a person with herpes zoster can transmit the virus by means of direct skin contact if the blisters break. Most patients who do not remember having had chickenpox are VZV seropositive, and, by the age of 40, >99% of the population have antibodies to VZV.⁶ In addition, data have shown the zoster vaccine to be safe in VZV-seronegative patients.⁷ Thus, VZV serologic testing is not recommended prior to vaccinations.⁴ Consistent with this rationale, serologic testing was not an entry requirement for the Shingles Prevention Study, the pivotal study that led to FDA approval of the zoster vaccine.

Decision: No. The zoster vaccine is approved for patients ≥ 60 years of age.

The herpes zoster vaccine is not approved by the FDA or recommended by the ACIP in patients aged <60 years, since its efficacy has not been rigorously evaluated in this patient population.^{4,7} However, studies are ongoing to assess the safety and efficacy of the herpes zoster vaccine in this patient population. Thus, this patient should not be vaccinated with the herpes zoster virus, but she should be encouraged to return when she is 60 years of age.

CASE STUDY

A 64-Year-Old Woman in Remission From CLL



Presentation

Sylvia, a 64-year-old woman who is in remission from chronic lymphocytic leukemia (CLL), arrives at your clinic for her annual check-up. Her past medical history is unremarkable and her active health problems include the CLL in remission and hypertension, which is controlled with pharmacotherapy. Her last chemotherapy cycle was completed 6 months ago. Sylvia currently has no adenopathy, almost all of her hair has grown back, and her blood work shows that her hematocrit, white blood cell count, and platelet count have all returned to within normal range. The patient inquires about receiving the herpes zoster vaccine because she remembers that both of her parents had shingles in their 70s. However, she does not recall whether she has ever had chickenpox.

Clinical Decision Point

Should this patient receive the zoster vaccine?

- No. Patients with a history of cancer should not receive the zoster vaccine
- No. Immunocompromised patients should not receive the zoster vaccine
- No. Patients with chronic medical conditions such as hypertension should not receive the zoster vaccine
- Yes. Patients whose leukemia is in remission and who have not received chemotherapy or radiation therapy for at least 3 months may receive the zoster vaccine

Comment

The prescribing information for the herpes zoster vaccine indicates that patients with a history of immune deficiency or those undergoing immunosuppressive therapy should not receive the vaccine³; however, the ACIP has provided further guidance on the contraindications included in the original prescribing information. The ACIP recommendations state that patients whose leukemia is in remission and who have not received chemotherapy or radiation therapy within the last 3 months may receive the zoster vaccine.⁴ Moreover, dosages of methotrexate ≤ 0.4 mg/kg/wk, azathioprine ≤ 3.0 mg/kg/d, and 6-mercaptopurine ≤ 1.5 mg/kg/d are also not considered sufficiently immunosuppressive to raise concern.⁴ Patients ≥ 60 years of age undergoing hematopoietic stem cell transplantation should be assessed on a case-by-case basis. The zoster vaccine should be given no sooner than 24 months after transplantation.⁴

Decision: Yes. Patients whose leukemia is in remission and who have not received chemotherapy or radiation therapy for at least 3 months may receive the zoster vaccine.

Despite this patient's treatment for leukemia, sufficient time has passed to warrant administration of the zoster vaccine. Additionally, the zoster vaccine has been shown to be

safe in VZV-seronegative patients.⁷ As stated above, serologic testing to determine varicella immunity is not required and the vaccine is safe in patients with chronic medical conditions.⁴

Conclusion

The Shingles Prevention Study established the safety, tolerability, and efficacy of the zoster vaccine in reducing the burden of illness due to herpes zoster and the incidence of PHN. Based on these results, the FDA approved the herpes zoster vaccine for the prevention of herpes zoster in individuals ≥ 60 years of age. The ACIP also recommended the zoster vaccine to reduce the risk of zoster and its associated pain in persons ≥ 60 years of age who have no contraindications, including those who report a previous episode of herpes zoster and those with chronic medical conditions.

The population of older Americans is increasing, and more people are living longer with disease-induced or treatment-induced immunosuppression.^{8,9} These realities suggest that the already large number of zoster cases will only increase. However, according to results from the CDC's 2007 National Immunization Survey, only 2% of adults ≥ 60 years of age reported receiving the herpes zoster vaccine during its first year of availability.¹⁰ Results from the same survey indicated that out of 843 adults ≥ 60 years of age who did not receive the zoster vaccine (but were aware of the disease and the vaccine), 48% believed that they did not need the vaccine, 13% did not know that they should be vaccinated, and an additional 8% were concerned about adverse events.¹⁰

To successfully increase vaccination rates, primary care providers must effectively communicate to their patients the risks and benefits of vaccination. One study designed to assess patient acceptance of the influenza vaccine demonstrated that after discussing vaccine efficacy and safety with their primary care provider, patients were 19% more likely to get vaccinated.¹¹ Another way to improve vaccination rates would be to develop office protocols to safeguard against patients missing recommended vaccinations, including assessing patient vaccination status, administering and documenting vaccinations properly, and implementing patient/clinician reminders to prompt vaccinations. If necessary, patients should be referred to other facilities or specialty clinics (ie, infectious disease or travel clinics) to receive required vaccinations.¹²

References

1. Oxman MN, Levin MJ, Johnson GR, et al. A vaccine to prevent herpes zoster and postherpetic neuralgia in older adults. *N Engl J Med*. 2005;352:2271-2284.
2. Levin MJ, Oxman MN, Zhang JH, et al; and the Veterans Affairs Cooperative Studies Program Shingles Prevention Study Investigators. Varicella-zoster virus-specific immune responses in elderly recipients of a herpes zoster vaccine. *J Infect Dis*. 2008;197:825-835.
3. Zostavax [package insert]. Whitehouse Station, NJ: Merck & Co., Inc.; 2007.
4. Centers for Disease Control and Prevention. Prevention of herpes zoster: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2008;57(RR-5):1-30.
5. Kerzner B, Murray AV, Cheng E, et al. Safety and immunogenicity profile of the concomitant administration of ZOSTAVAX and inactivated influenza vaccine in adults aged 50 and older. *J Am Geriatr Soc*. 2007;55:1499-1507.
6. Kilgore PE, Kruszon-Moran D, Seward JF, et al. Varicella in Americans from NHANES III: implications for control through routine immunization. *J Med Virol*. 2003;70(suppl):S111-S118.
7. Macaladad N, Marcano T, Guzman M, et al. Safety and immunogenicity of a zoster vaccine in varicella-zoster virus seronegative and low-seropositive healthy adults. *Vaccine*. 2007;25:2139-2144.
8. Poland GA, Shefer AM, McCauley M, et al; and the National Vaccine Advisory Committee. Standards for adult immunization practices. *Am J Prev Med*. 2003;25:144-150.
9. Mounsey AL, Matthew LG, Slawson DC. Herpes zoster and postherpetic neuralgia: prevention and management. *Am Fam Physician*. 2005;72:1075-1080.
10. Euler GL. Adult Vaccination Coverage National Immunization Survey—Adult, 2007. Presented at: National Immunization Conference; March 20, 2008; Atlanta, GA.
11. Nichol KL, Zimmerman R. Generalist and subspecialist physicians' knowledge, attitudes, and practices regarding influenza and pneumococcal vaccinations for elderly and other high-risk patients: a nationwide survey. *Arch Intern Med*. 2001;171:2702-2708.
12. Poland GA. The growing paradigm of preventing disease: vaccines to prevent herpes zoster and pertussis in adults [editorial]. *Ann Intern Med*. 2005;143:539-541.

