2018 Clinical Practice Guidelines

Influenza, Pneumococcal, Hepatitis B and Herpes Zoster Vaccinations

Diabetes Canada Clinical Practice Guidelines Expert Committee

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KEY MESSAGES

- Influenza vaccination can reduce hospitalization rates by approximately 40% for those individuals deemed to be at high risk.
- Pneumococcal vaccination is desired in people with diabetes as they are considered as likely to be infected as those with other chronic diseases.
- Adults with type 1 and type 2 diabetes are at higher risk of hepatitis B virus infection.

KEY MESSAGES FOR PEOPLE WITH DIABETES

- You should receive routine vaccinations as recommended for anyone with or without diabetes. Check if you are up to date with your vaccinations.
- You should receive:
  - Influenza vaccination ("flu shot") every year
  - Pneumococcal vaccination:
    - Initially, when you are over the age of 18 years
    - And, again, when you are over the age of 65 years (if your original vaccination was given when you were younger than 65 years and your last vaccination was over 5 years ago)

Introduction

People with diabetes are considered to be at high risk for morbidity and mortality from influenza and pneumococcal disease (1,2). During recent influenza epidemics, diabetes was considered a significant risk factor for hospitalization (3). Influenza vaccination is associated with up to a 40% risk reduction in mortality (4). Clinical recommendations for vaccination are derived from large cohort studies that included people with diabetes as trials specific to individuals with diabetes and mortality from influenza and pneumonia alone for persons with diabetes aged 19 to 64 years. For elderly and working-age adults, the elderly and working-age adults are at similar risk of developing pneumococcal disease as those with other chronic conditions (5–7). It is accepted that people with diabetes are at similar risk of developing pneumococcal disease as those with other chronic conditions (1,2). People with diabetes are at an increased risk of hospitalization for pneumococcal disease (1,2). Prior pneumococcal vaccination is associated with a reduction in death and complications in hospitalized adults with community-acquired pneumonia (13). It is accepted that people with diabetes are at similar risk of developing pneumococcal disease as those with other chronic conditions (1,2) and, therefore, those with diabetes are encouraged to receive pneumococcal vaccination. Revaccination is recommended as a 1-time event for individuals ≥65 years of age if the original vaccine was given when they were <65 years of age and >5 years earlier. Health Canada recommends vaccination with Pneu-P-23 as more serotypes are included in this vaccine (14).

Pneumococcal Vaccination in Adults

People with diabetes are at an increased risk of hospitalization for pneumococcal disease (1,2). Prior pneumococcal vaccination is associated with a reduction in death and complications in hospitalized adults with community-acquired pneumonia (13). It is accepted that people with diabetes are at similar risk of developing pneumococcal disease as those with other chronic conditions (1,2). People with diabetes are at an increased risk of hospitalization for pneumococcal disease (1,2). Prior pneumococcal vaccination is associated with a reduction in death and complications in hospitalized adults with community-acquired pneumonia (13). It is accepted that people with diabetes are at similar risk of developing pneumococcal disease as those with other chronic conditions (1,2) and, therefore, those with diabetes are encouraged to receive pneumococcal vaccination. Revaccination is recommended as a 1-time event for individuals ≥65 years of age if the original vaccine was given when they were <65 years of age and >5 years earlier. Health Canada recommends vaccination with Pneu-P-23 as more serotypes are included in this vaccine (14).

Some experts suggest a dose of pneumococcal conjugate vaccine followed by Pneu-P-23 vaccine for immunocompetent adults at high risk of pneumonia-influenza disease due to an underlying medical condition, as this may theoretically improve antibody response and immunologic memory (15). If this strategy is chosen, Pneu-C-13 vaccine should be administered first, followed at least 8 weeks later by Pneu-P-23 vaccine. However, Pneu-P-23 vaccine is the vaccine of choice for these individuals. If only 1 vaccine can be provided, it should be Pneu-P-23 vaccine (16). The Centers for Disease Control and Prevention Advisory Committee on Immunization Practices recommends Pneu-P-23 vaccination alone for persons with diabetes aged 19 to 64 years. For people with diabetes ≥65 years or with an immunocompromising condition (e.g., chronic renal failure), they recommend Pneu-C-13 vaccine should be administered first, followed at least 8 weeks later.
by Pneu-P-23 vaccine. In people who have already received Pneu-P-23, at least 1 year should elapse before they are given Pneu-C-13.

Hepatitis B Vaccination

Hepatitis B (HBV) is a highly infectious blood borne pathogen that can lead to acute and chronic liver disease and can be a source of significant morbidity and mortality. HBV infection is the leading cause of hepatocellular carcinoma (HCC), and is the cause of 50% of HCC noted worldwide (17). Hepatitis B and C viruses with Helicobacter pylori and human papilloma viruses were responsible for 1.9 million cases of new cancers in 2008, which included liver, gastric and cervical cancers (18). Vaccination against HBV has been effective in reducing childhood HCC and Hepatitis B in Taiwan (19).

Hepatitis B and Diabetes

Adults with type 1 and type 2 diabetes are at higher risk of HBV infection (20). Reilly et al showed that adults between the ages of 23 to 59 years with diabetes were at approximately twice the risk of acute HBV compared with adults without diabetes. People with diabetes can be exposed in many ways to HBV when there is assisted glucose monitoring (20–22). Outbreaks in 2003–2004 of HBV in long-term care homes in the United States, in Mississippi, North Carolina and Los Angeles, prompted an evaluation of HBV in adults with diabetes (22). Infections in these facilities were felt to be due to lack of compliance and implementation of standard hygienic protocols (23). In response, the Hepatitis Vaccines Work Group of the Advisory Committee on Immunization Practices (ACIP) was formed and, based on their findings, HBV vaccination was recommended for those diagnosed with diabetes (24,25). The ACIP report stated that current HBV vaccines are less efficacious and less cost-effective among older adults and recommended that decisions to vaccinate adults with diabetes who are aged >60 years of age incorporate consideration of the person’s likelihood of acquiring HBV infection, including the risk posed by an increased need for assisted glucose monitoring in long-term care facilities, the likelihood of experiencing chronic sequelae if infected with HBV, and the declining immunologic responses to vaccines that are associated with frailty (24). In Canada, the National Advisory Committee on Immunization recommends HBV vaccine for all children and those in high-risk groups but does not specify individuals with diabetes (14).

Herpes Zoster

The varicella-zoster virus causes 2 distinct syndromes (26). The primary infection syndrome of varicella-zoster presents as varicella (chicken pox). The secondary infection syndrome is the reactivation of the latent varicella-zoster virus in the cranial nerve or dorsal-root ganglia, with spread of the virus along the sensory nerve to the dermatome-termed herpes zoster (26). Herpes zoster are painful blisters or rash, commonly known as shingles. The most common complication of herpes zoster, which persists several months after the lesions have healed, is postherpetic neuralgia pain (27). Complications from herpes zoster can impact significantly on the quality of life for individuals (28).

The annual incidence rate of herpes zoster ranges between 3 to 5 cases per 1000 person-years (29). In Canada, approximately 20% of Canadians are expected to develop herpes zoster at some point in their lives, with an annual report of 130,000 new cases of herpes zoster each year (30). Although the causes of herpes zoster are not fully understood (27), conditions such as inflammatory bowel diseases, diabetes and certain cancerous tumours and leukemias have been associated with an increased risk of herpes zoster (30). The major risk factor for herpes zoster is increased with age. Approximately two-thirds of herpes zoster cases occur in adults 50 years of age and older (27). There is a reduction in cellular immunity during the natural process of aging that predisposes older people to herpes zoster (28). The incidence of herpes zoster also increases substantially in immunocompromised individuals.

Herpes Zoster and Diabetes

Evidence from previous studies has demonstrated that diabetes mellitus is often accompanied by impaired cell-mediated immunity (31). Individuals with diabetes are more prone to infection than individuals without diabetes (32). The clinical evidence regarding diabetes as a risk factor for herpes zoster is scarce. A study conducted by Okamoto et al showed an association between diabetes and herpes zoster (33). Among individuals with diabetes between the ages of 41 to 79 years of age, there was significantly lower cell-mediated immunity to varicella zoster virus compared to the individuals without diabetes (33).

According to the Advisory Committee on Immunization Practices (ACIP) and Canadian Public Health Services (34,35), recommendations for the herpes zoster vaccine are as follows:

- Routinely recommend for adults ≥60 years of age.
- Vaccination before 60 years of age might not have the required protection when the risks and complications of herpes zoster are highest (i.e. ≥60 years of age).
- Protection offered by the herpes zoster vaccine wanes within the first 5 years (36).
- Beyond 5 years of vaccination, duration of protection is uncertain.
- Immunocompromised individuals are an important group to consider when discussing vaccinations, such as herpes zoster vaccine.

RECOMMENDATIONS


2. People with diabetes should receive an annual influenza vaccination during the flu season to reduce the risk of influenza-related hospitalizations and death [Grade C, Level 3 (5)].

3. Pneu-P-23 vaccination should be offered to persons with diabetes aged 19 to 64 years. A 1-time revaccination is recommended for those ≤65 years of age (if the original vaccine was given when they were ≤65 years of age). For people with diabetes ≤65 years or with an immunocompromising condition (e.g. end stage renal disease), Pneu-C-13 vaccine should be administered first, followed at least 8 weeks later by Pneu-P-23 vaccine. In people who have already received Pneu-P-23, at least 1 year should elapse before they are given Pneu-C-13 [Grade D, Consensus].

Abbreviations: HBV, hepatitis B; HCC, hepatocellular carcinoma.

Related Websites

Author Disclosures

Dr. Husein reports support from Amgen, Eli Lilly, Novo Nordisk, AstraZeneca, Boehringer Ingelheim, Merck, and Janssen, outside the submitted work. No other author has anything to disclose.

References