FPIN's Help Desk Answers

Effectiveness of Pneumococcal Vaccines

Marvin Sineath Jr., MD, and Kristin McPhillips, MD
Memorial Health Family Medicine Residency, Savannah, Georgia

Clinical Question

How effective are pneumococcal polysaccharide vaccines in preventing pneumonia in adults?

Evidence-Based Answer

The 23-valent pneumococcal polysaccharide vaccine (PPSV23; Pneumovax 23) decreases the relative risk of community-acquired pneumonia in adults by 13%. The risk is reduced by 28% in the population that includes adults older than 65 years, those with lung disease, and those living in a nursing home. (Strength of Recommendation [SOR]: B, based on a meta-analysis of lower-quality randomized controlled trials [RCTs].) PPSV23 also lowers the risk of pneumonia in nursing home residents, but not in community-dwelling patients. (SOR: B, based on a meta-analysis of lower-quality RCTs.) PPSV23 should be given to all patients 65 years and older and to younger patients with comorbidities such as chronic heart or lung disease. (SOR: C, based on expert opinion.)

Evidence Summary

A 2016 systematic review and meta-analysis of seven RCTs (N = 156,010) evaluated the effectiveness of PPSV23 in preventing community-acquired pneumonia over two to seven years.[1] The control groups received a placebo injection, influenza vaccine, or no intervention. Multiple groups were included in the studies: adults older than 65 years, persons 19 to 64 years of age at risk of pneumonia because of chronic lung disease or living in a nursing home, healthy military recruits 17 to 20 years of age, and adults with a history of community-acquired pneumonia. The diagnosis of pneumonia was made by clinical symptoms and chest radiography. PPSV23 decreased the risk of pneumonia compared with placebo (relative risk [RR] = 0.87; 95% confidence interval [CI], 0.76 to 0.98; number needed to treat [NNT] = 1,134). The effect was greater in adults older than 65 years, nursing home residents, and in those with lung disease (five trials, N = 3,287; RR = 0.72; 95% CI, 0.69 to 0.94). Limitations included lack of standardization for the diagnosis of pneumonia.

A 2016 meta-analysis of four RCTs (N = 29,218) investigated the effectiveness of PPSV23 in preventing pneumococcal-specific pneumonia (confirmed by symptoms, radiology, and laboratory testing) in adults 60 years and older and in immunocompromised adults 18 years and older.[2] For controls, the studies used placebo injection, influenza vaccine, or no intervention, with a follow-up period ranging from two to three years. The vaccine decreased the risk of pneumococcal pneumonia in nursing home residents (one trial,

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N = 1,006; odds ratio [OR] = 0.36; 95% CI, 0.19 to 0.68), but not in community-dwelling patients (three trials, N = 28,212; OR = 1.11; 95% CI, 0.64 to 1.9). Limitations included different methods of laboratory testing to confirm the diagnosis of pneumococcal pneumonia.

The Advisory Committee on Immunization Practices recommends PPSV23 for all patients 65 years and older, and for younger patients with comorbid or immunocompromising conditions.[3]

Address correspondence to Marvin Sineath Jr., MD, at sineama1@memorialhealth.com. Reprints are not available from the authors.

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