Influenza Vaccination and Lower Mortality Rates in Adults Hospitalized with Pneumonia

Spaude KA, Abrutyn E, Kirchner C, et al. Influenza vaccination and risk of mortality among adults hospitalized with community-acquired pneumonia. Arch Intern Med 2007;167:53–9.

Study Overview

Objective. To evaluate if prior influenza vaccination is associated with reduced in-hospital mortality among adults with community-acquired pneumonia (CAP).

Design. Retrospective cohort study.

Setting and participants. Adults aged ≥ 18 years hospitalized with CAP during "influenza season" (November–April, 1999–2003) at 34 hospitals in 4 states (California, Florida, Louisiana, Missouri) operated by Tenet HealthCare Corporation (Dallas, TX) were identified from a patient care quality improvement database. Individuals were considered to be currently vaccinated against influenza if they received a vaccine the October before the beginning of influenza season. Vaccine status was recorded as received, not received, or unknown.

Main outcome measure. All-cause in-hospital mortality.

Main results. Of 17,393 individuals for whom records were available for analysis, vaccination status was available for 8251 individuals, of whom only 1590 (19%) were classified as having current influenza vaccination. Vaccinated individuals were less likely to die while hospitalized compared with those who were not vaccinated (odds ratio [OR], 0.30 [95% confidence interval {CI}, 0.22–0.41]). After adjusting for the presence of comorbid illness and pneumococcal vaccination, vaccinated individuals remained less likely to die during hospitalization (adjusted OR, 0.61 [95% CI, 0.43–0.87]).

Conclusion. Influenza vaccination was associated with improved survival in hospitalized patients with CAP.

Commentary

Influenza is estimated to result in more than 225,000 hospitalizations in the United States each year [1]. Vaccination is the primary prevention strategy against influenza. The U.S. Advisory Committee on Immunization Practices recommends annual influenza vaccination for all persons older than 50 years of age, children aged 6 months to 59 months, women who are pregnant during influenza season, and adults and children with chronic conditions, including cardiovascular disease and diabetes. Nevertheless, influenza vaccination rates among target populations are well below national goals (32.3% in 2006) and are marked by disparities across age categories [2]. Suboptimal levels of vaccination may be explained by the fact that vaccination does not provide 100% protection against influenza. However, even if infection is not prevented, vaccination may confer additional health benefits.

This study by Spaude et al used data collected for a quality improvement initiative by trained nurse case managers at 34 hospitals (1 teaching and 33 community hospitals). The sample size was large and discharge status was verified for all patients. However, more than 50% of the study population had unknown vaccination status, and only 19% of the population had been vaccinated. However, in multivariate analysis adjusting for clustering, comorbid conditions, and pneumococcal vaccination status, Spaude and colleagues tested differing assumptions about individuals with unknown vaccination status and found that influenza vaccination remained effective in preventing mortality. The magnitude of influenza vaccination effect was greatest when individuals with unknown vaccination status were excluded (OR, 0.57 [95% CI, 0.04–0.80]) and smallest when vaccination was assumed (OR, 0.78 [95% CI, 0.60–1.00]).

Despite its retrospective nature, the lack of microbiologic data, and assumptions about vaccination status, this study effectively demonstrated that influenza vaccination confers a mortality benefit, although vaccination did not prevent hospitalization for CAP. However, these results should be confirmed in future studies.

Applications for Clinical Practice

Providers should recommend vaccinations for all patients at risk for influenza, and public health officials should evaluate programs and policies that facilitate vaccination efforts.

—Review by Mark S. Horng, MD, MPH

References

1. Thompson W, Shay D, Weintraub E, et al. Influenza-

associated hospitalizations in the United States. JAMA 2004; 292:1333–40.

2. Centers for Disease Control and Prevention. Estimates of influenza vaccination target population sizes in 2006 and recent vaccine uptake levels. Available at www.cdc.gov/flu/professionals/vaccination/pdf/targetpopchart.pdf. Accessed 11 Feb 2007.