

Original Investigation

Association Between Hospitalization With Community-Acquired Laboratory-Confirmed Influenza Pneumonia and Prior Receipt of Influenza Vaccination

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IMPORTANCE Few studies have evaluated the relationship between influenza vaccination and pneumonia, a serious complication of influenza infection.

OBJECTIVE To assess the association between influenza vaccination status and hospitalization for community-acquired laboratory-confirmed influenza pneumonia.

DESIGN, SETTING, AND PARTICIPANTS The Etiology of Pneumonia in the Community (EPIC) study was a prospective observational multicenter study of hospitalizations for community-acquired pneumonia conducted from January 2010 through June 2012 at 4 US sites. In this case-control study, we used EPIC data from patients 6 months or older with laboratory-confirmed influenza infection and verified vaccination status during the influenza seasons and excluded patients with recent hospitalization, from chronic care residential facilities, and with severe immunosuppression. Logistic regression was used to calculate odds ratios, comparing the odds of vaccination between influenza-positive (case) and influenza-negative (control) patients with pneumonia, controlling for demographics, comorbidities, season, study site, and timing of disease onset. Vaccine effectiveness was estimated as $(1 - \text{adjusted odds ratio}) \times 100\%$.

EXPOSURE Influenza vaccination, verified through record review.

MAIN OUTCOMES AND MEASURES Influenza pneumonia, confirmed by real-time reverse-transcription polymerase chain reaction performed on nasal/oropharyngeal swabs.

RESULTS Overall, 2767 patients hospitalized for pneumonia were eligible for the study; 162 (5.9%) had laboratory-confirmed influenza. Twenty-eight of 162 cases (17%) with influenza-associated pneumonia and 766 of 2605 controls (29%) with influenza-negative pneumonia had been vaccinated. The adjusted odds ratio of prior influenza vaccination between cases and controls was 0.43 (95% CI, 0.28-0.68; estimated vaccine effectiveness, 56.7%; 95% CI, 31.9%-72.5%).

CONCLUSIONS AND RELEVANCE Among children and adults hospitalized with community-acquired pneumonia, those with laboratory-confirmed influenza-associated pneumonia, compared with those with pneumonia not associated with influenza, had lower odds of having received influenza vaccination.

JAMA. 2015;314(14):1488-1497. doi:10.1001/jama.2015.12160
Published online October 5, 2015.

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