

Influenza vaccination and risk of community-acquired pneumonia in immunocompetent elderly people: a population-based, nested case-control study

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FROM ABSTRACT

Background

Pneumonia is a common complication of influenza infection in elderly individuals and could therefore potentially be prevented by influenza vaccination.

We assessed whether influenza vaccination is associated with a reduced risk of community-acquired pneumonia in immunocompetent elderly people after controlling for health status indicators.

Methods

We did a population-based, nested case-control study in immunocompetent elderly people aged 65–94 years (cases and controls) enrolled in Group Health (a health maintenance organization) during the 2000, 2001, and 2002 preinfluenza periods and influenza seasons. Cases were individuals with an episode of outpatient or inpatient community-acquired pneumonia (validated by review of medical records or chest radiograph reports). We randomly selected two age-matched and sex-matched controls for each case. The exposure of interest was influenza vaccination. We reviewed medical records to define potential confounders, including smoking history, presence and severity of lung and heart disease, and frailty indicators.

Findings

1,173 cases and 2,346 controls were included in the study.

After we adjusted for the presence and severity of comorbidities, as defined by chart review, influenza vaccination was not associated with a reduced risk of community-acquired pneumonia during the influenza season.

Interpretation

The effect of influenza vaccination on the risk of pneumonia in elderly people during influenza seasons might be less than previously estimated.

THESE AUTHORS ALSO NOTE:

“A common and serious complication of influenza infection in these individuals is pneumonia, which results either from direct viral infection of the lung parenchyma or from secondary bacterial infection.”

Previous studies documenting the incidence of pneumonia in influenza-vaccinated elderly have not been adequately controlled, and consequently the published data may not be accurate.

Therefore, these authors did a large population-based, nested case-control study to estimate the effectiveness of the influenza vaccine in preventing both outpatient and inpatient pneumonia in elderly people.

DISCUSSION

78% had received influenza vaccination by the end of the influenza season.

“In this large population-based, nested case-control study done across three influenza seasons, vaccination was not associated with a significant reduction in the risk of community-acquired pneumonia in elderly individuals.”

“Estimates of the incidence of serious complications of influenza and of the effectiveness of vaccine against these complications are important for pandemic planning and for the optimum control strategies for non-pandemic influenza. In our study, influenza vaccination was not associated with a reduced risk of all-cause pneumonia in elderly individuals.”

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“The results [of this study] were not encouraging. Vaccination was associated with an 8% reduction in pneumonia during broadly defined influenza periods. During peak influenza periods, when influenza related pneumonia should be most common, vaccine effectiveness was -4% [meaning influenza vaccinated elderly were 4% **more** likely to come down with pneumonia than those who were not vaccinated].”

This study has advantages over other published studies on the topic because:

- 1) The authors reviewed medical records to obtain detailed information about illness severity and functional status of participants, and used this information to adjust for confounding.
- 2) The authors validated all diagnoses of pneumonia.
- 3) The authors included both inpatient and outpatient cases, whereas previous studies focused on those admitted to hospital.

KEY POINTS FROM DAN MURPHY:

- 1) A major complication from influenza is pneumonia, which often leads to death.
- 2) Poorly done studies suggest that vaccination against influenza also reduces the incidence of associated pneumonia.

- 3) This important study is the best done to date on the topic of pneumonia incidence associated with influenza vaccination. In this study, "influenza vaccination was not associated with a reduced risk of community-acquired pneumonia during the influenza season."
- 4) "In this large population-based, nested case-control study done across three influenza seasons, vaccination was not associated with a significant reduction in the risk of community-acquired pneumonia in elderly individuals."
- 5) "Influenza vaccination was not associated with a reduced risk of all-cause pneumonia in elderly individuals."
- 6) In those elderly who received the influenza vaccination, "during peak influenza periods, when influenza related pneumonia should be most common, vaccine effectiveness was -4% [meaning influenza vaccinated elderly were 4% more likely to come down with pneumonia than those who were not vaccinated]."
- 7) "The results [of this study] were not encouraging."