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Impact of the pneumococcal vaccine on long-term morbidity and mortality of adults at high risk for pneumonia.

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BACKGROUND: Current guidelines recommend vaccinating individuals at increased risk of CAP with the 23-valent polysaccharide pneumococcal vaccine (PPV) [7] because the bacterium *Streptococcus pneumoniae* causes at least 30%–50% of all cases of CAP [8]. Although it is generally accepted that PPV prevents uncommon but serious episodes of invasive pneumococcal disease [9, 10], there is considerable debate regarding the clinical effectiveness of PPV for actually preventing pneumonia. Indeed, most observational studies and randomized, controlled trials suggest that PPV is relatively ineffective in preventing pneumonia [10, 11], although there is limited evidence suggesting the vaccine might reduce in-hospital death or the need for intensive care unit admission in those who develop CAP [4, 12]. The impact of PPV on pneumococcal- related morbidity and mortality in high-risk patients, such as those who have survived an episode of pneumoniarelated hospitalization, is even less well characterized. The only randomized, controlled trial evaluating the efficacy of PPV in preventing additional episodes of CAP was inconclusive, likely because it was underpowered [13, 14]. To our knowledge, no study has examined the effectiveness of PPV in individuals at perhaps the greatest risk of pneumonia: those patients who have survived an episode of hospitalization for CAP. Thus, we sought to determine whether PPV is associated with reduced mortality or additional admissions to the hospital for potentially vaccine-preventable infections in a cohort of individuals at high risk of CAP during 5 years of followup.

METHODS: From 2000 through 2002, adults with CAP admitted to the hospital in Edmonton, Alberta, Canada, were enrolled in a population-based cohort. Postdischarge outcomes during 5 years were ascertained using administrative databases. The primary outcome was the composite of all-cause mortality or additional hospitalization for vaccine-preventable infections. Proportional hazards analysis was used to determine the association between PPV use and outcomes.

RESULTS: A total of 2950 patients were followed up for a median of 3.8 years. The mean patient age was 68 years; 52% were male. One-third (n = 956) received PPV: 667 (70%) before and 289 (30%) during hospitalization. After discharge, 1404 patients (48%) died, 504 (17%) were admitted with vaccine-preventable infections, and 1626 (55%) reached the composite outcome of death or infection. PPV was not associated with reduced risk of the composite outcome (589 [62%] vs 1037 [52%] for those unvaccinated; adjusted hazard ratio [HR], 0.91; 95% confidence interval [CI], 0.79-1.04). Results were not altered in sensitivity analyses using propensity scores (adjusted HR, 0.91; 95% CI, 0.79-1.04), restricting the sample to patients 65 years or older (adjusted HR, 0.90; 95% CI, 0.77-1.04), or considering only those who received PPV at discharge (adjusted HR, 0.84; 95% CI, 0.71-1.00).

CONCLUSIONS: One-half of patients discharged from the hospital after pneumonia die or are subsequently hospitalized with a vaccine-preventable infection within 5 years. PPV was not associated with a reduced risk of death or hospitalization. Better pneumococcal vaccination strategies are urgently needed.

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