Influenza Vaccines in Immunosuppressed Adults With Cancer

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Objective
To assess the effectiveness of influenza vaccination in immunosuppressed adult patients with malignancies.

Type of Review
A review containing one randomized, controlled trial (RCT) and three observational studies.

Relevance for Nursing
Immunosuppressed patients with cancer are at an increased risk of complications from influenza. The major morbidity associated with influenza is the worsening of chronic health conditions. The estimated mortality rate of influenza and pneumonia in healthy adults is less than 10 per 100,000, compared to an estimated greater than 600 per 100,000 in chronically ill adults. Overall, influenza-related hospitalization and mortality rates are 4 and 10 times higher, respectively, among patients with cancer when compared to the general population.

The influenza vaccine protects against influenza and its complications. Patients with cancer who have impaired immune function are likely to have a reduced response to influenza vaccination; however, that high-risk group is also likely to benefit from any degree of protection that the vaccination may provide. Data related to the effectiveness of influenza vaccination were lacking, necessitating this review.

Characteristics of the Evidence
Four studies (one RCT, one case-control study, and two cohort studies) with a total of 2,124 participants that compared adult patients with cancer who received an influenza vaccine with patients who received no vaccine were included in the review. Studies were conducted in the United States, Brazil, Italy, and Israel. The participants were adults aged 16 years or older with solid or hematologic cancers who were receiving active chemotherapy (three studies) or who were bone marrow transplantation recipients (one study). The mean age of participants was reported in two studies and ranged from 60–74 years. The influenza trivalent inactivated vaccine administered in a single dose was used in all studies.

The quality of the evidence was generally low. None of the studies blinded outcome assessors or participants to the intervention received, which was either vaccination or no vaccination, rendering all studies at a high risk of performance bias. The RCT was rated at unclear risk of selection bias because of inadequate reporting of randomization or allocation concealment, and the three observational studies were deemed at high risk of selection bias.

The primary outcome was all-cause mortality, with secondary outcomes including influenza-like illness, confirmed influenza, pneumonia from any cause, hospitalization events and duration, chemotherapy interruptions, influenza-related mortality, and adverse events. Meta-analysis was not possible, and results were described narratively for each outcome.

Summary of Key Evidence
Two studies examined the outcome of all-cause mortality. Influenza vaccination was associated with an adjusted hazard ratio for death of 0.88 (N = 1,225; person-years = 1,577; 95% confidence interval [CI] [0.77, 0.99]) for one study and an adjusted odds ratio (OR) for death of 0.43 (N = 806; 95% CI [0.26, 0.71]) for the other.

Influenza-like illness was examined in two studies. The RCT showed a significant benefit of vaccination compared with no vaccination (N = 50; OR = 0.18; 95% CI [0.05, 0.61]). However, the cohort study showed no difference in events of influenza-like illness between the two groups.

Three studies showed the outcome of confirmed influenza. A statistically significant reduction occurred in the number of confirmed influenza events per person in the vaccinated group compared with no vaccination in one observational study (N = 43; OR = 0.12; 95% CI [0.002, 0.62]). Results from two other studies showed a nonsignificant effect in favor of vaccination.

Three studies examined pneumonia as an outcome. A statistically significant reduction in pneumonia events occurred in the vaccinated group compared with the unvaccinated group in one study (N = 1,225; person-years = 1,577; OR = 0.31; 95% CI [0.14, 0.72]). The RCT showed a nonsignificant benefit of vaccination, and the third study did not show a difference between vaccinated and unvaccinated groups.