Outcomes of Influenza infections in hematopoietic cell transplant recipients

Influenza infection causes mild disease in most cases and severe complications in very few cases. The severity of influenza infection depends mainly on the type of influenza virus and the status of the patient's immune system. Since cancer patients who receive bone marrow or stem cell transplants have decreased immunity and poor responses to influenza vaccines (the best way to prevent influenza infection), they are more susceptible to severe influenza complications such as pneumonia and death.

Our study described clinical characteristics of and outcomes in 146 stem cell transplant recipients at The University of Texas MD Anderson Cancer Center who developed influenza infection from July 2009 to December 2014. We determined factors that increased the likelihood of these patients presenting later in the course of their influenza infection when they have developed pneumonia. We also tested the ability of our immunodeficiency scoring index (ISI), which categorizes patients by risk level, to identify patients at a higher risk for pneumonia and death after influenza infection.

As in the general population, the most common presenting influenza symptoms in these cancer patients were fever and cough. The median time from the beginning of influenza symptoms to visiting a clinic was 2 days. Most patients had acquired the influenza infections outside of a health care setting. Forty-two percent needed hospital admission, including 8% requiring admission to the intensive care unit and 5% requiring mechanical ventilation. Twenty-three percent developed pneumonia. Seven patients (5%) died within 30 days of diagnosis, including six patients whose deaths were influenza associated.

Patients presenting with very low lymphocyte levels on a complete blood count, elevated creatinine levels, and low oxygen saturation at diagnosis were more likely to have severe complications from influenza. Patients who were black and who waited longer to visit the clinic after their symptoms appeared were more likely to have influenza associated pneumonia. Patients in the high-risk ISI group were more likely to develop pneumonia than those in the low-risk group**.** Early antiviral therapy for influenza infection reduced the development of pneumonia in all patients. The greatest risk reduction from antiviral therapy was observed in the high-risk ISI group.

Early initiation of antiviral therapy for influenza is important in stem cell transplant recipients and may improve the outcomes of influenza in these patients. The ISI helps identify transplant recipients at risk for severe influenza infection and we recommend that these at-risk patients should be monitored more closely.

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