

Detection of Influenza Viremia Predicts Poor Outcome in Transplant Patients

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G Brennan

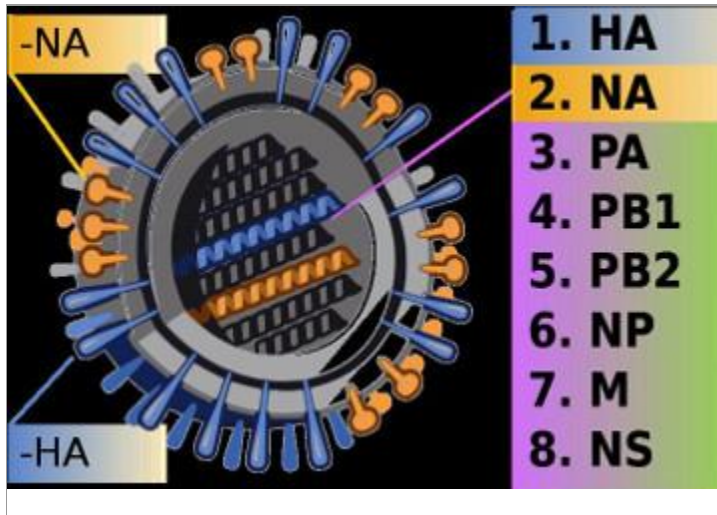
Viral respiratory infections in immunocompromised patients, such as those who have just undergone hematopoietic cell transplantation (HCT), can range from subclinical infections to pneumonia. Viral pneumonias are an important cause of morbidity and mortality in patients undergoing HCT, and can be caused by a variety of viruses, including respiratory syncytial virus, coronavirus, and influenza. Recent studies suggest that patients with influenza RNA in their blood (viremia) have a worse prognosis than patients who have influenza but do not have viremia. It is therefore important for patient health to establish this association, and to determine which risk factors contribute to the development of viremia.

To address these issues, senior author Dr. Michael Boeckh and a visiting scientist from South Korea, Dr. Su-Mi Choi (Vaccine and Infectious Disease Division) conducted a retrospective study of 79 influenza-positive HCT patients. Of these patients, nine had detectable influenza RNA in their blood, and viremia was significantly more common in patients that progressed to lower respiratory disease (LRD, $p=0.007$). Patients infected with the 2009 H1N1 pandemic strain were more likely to develop viremia ($p=0.02$), and this association held true even when the authors' statistical models accounted for lymphopenia (low white blood cell count) and antiviral treatment. Patients with detectable influenza RNA in their blood from any virus strain were at significantly higher risk for poor clinical outcomes including low oxygen saturation ($p=0.003$), respiratory failure ($p<0.001$), and death ($p<0.001$).

This is the first study to systematically define the presence of influenza viremia and the associated clinical outcomes in HCT patients. The work reported in this study suggests that testing for viremia in patients infected with influenza is a useful and important prognostic tool and may be used as an endpoint in clinical trials. Future studies will target larger cohorts to both confirm the associations found in this study and to define the optimal blood compartment for influenza RNA detection.

[Choi SM, Xie H, Campbell AP, Kuypers J, Leisenring W, Boudreault AA, Englund JA, Corey L, Boeckh M.](#) Influenza viral RNA detection in blood as a marker to predict disease severity in hematopoietic cell transplant recipients. *J Infect Dis*. Epub ahead of print, doi: 10.1093/infdis/jis610

See also: [Boeckh M](#). The challenge of respiratory virus infections in hematopoietic cell transplant recipients. *Br J Haematol*. 2008 Nov;143(4):455-67.



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Schematic diagram of influenza showing the RNA genome in the center of the virion. The authors used RT-PCR specific to the matrix (M) genes to detect influenza RNA in patient blood.