

<http://www.medscape.com/viewarticle/831878>

## New Technology Identifies Neurotropic Astrovirus

Kate Johnson

September 17, 2014

WASHINGTON — Stem cell transplant patients who develop unexplained neurologic disease should be tested for an emerging neurotropic astrovirus, British researchers reported here at the 54th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC).

The human-mink-ovine-like C astrovirus, recently discovered using deep sequencing technology and referred to as HMO-C/London/1, may be an underrecognized cause of neurologic infections in patients with severely impaired immune systems, according to the team, headed by Judith Breuer, MD, from University College London.

Deep sequencing is a new technique that analyzes all genetic material in a sample, allowing detection of unknown viruses.

"We are now using this technology routinely in children with unknown encephalitis following bone marrow transplantation," Dr. Breuer told *Medscape Medical News*. "Proving an infection can potentially spare them unnecessary and potentially harmful immunosuppressive and antibiotic therapy."

Normal human astroviruses cause mild diarrhea in young children, making the HMO-C/London/1 virus unusual, she said.

Dr. Breuer's group reported their first case in an immunosuppressed 18-month-old boy who developed encephalitis of unknown etiology 6 weeks after undergoing a hematopoietic stem cell transplant.

The child developed acute irritability with reduced consciousness, and electroencephalography indicated "a mild to moderate degree of nonspecific acute cerebral dysfunction," they reported.

Magnetic resonance imaging showed "progressive cerebral atrophy with widening of both the ventricles and cortical sulci."

Because routine testing only searches for known viruses, deep sequencing was used to test a brain biopsy specimen from the patient. Once the virus was detected, it was confirmed to exist in the patient's brain and cerebrospinal fluid by use of polymerase chain reaction and immunohistochemistry.

While recommending that this virus be tested for in immunocompromised patients with unknown neurologic disease, Dr. Breuer acknowledged that deep sequencing is "not easily adoptable by others, as

you need both technical and bioinformatics skills." But, she says, "it certainly could be taken on more." Aside from her group, she knows of only 2 US groups using the technique.

"Transplant patients are the sentinel chickens of infectious diseases. Their immune suppression makes it apparent that there are things out there that can cause tremendous disease that we didn't previously recognize," said Emily Blumberg, MD, a transplant specialist from the University of Pennsylvania, in Philadelphia, who was asked by *Medscape Medical News* to comment on the study. "A lot of these are not easily cultivatable pathogens, although I think with newer technologies, we're getting more sophisticated in our ability to recognize them."

The use of a technology such as whole genome sequencing is an incredible innovation, she added. "The downside is this is still available in such limited fashion. But there are a number of places around the country that are now doing pathogen discovery using these sorts of techniques, so I think this is a very exciting and interesting study because it showcases what the future could look like."

*Dr. Breuer has disclosed no relevant financial relationships. Dr. Blumberg reports having worked with Pfizer, Bristol Myers Squibb, Viropharma, Cubist, Achaogen, Ansun, and Actelion.*

54th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC): Abstract T468.  
Presented September 6, 2014.