

# Common virus may cause anemia in patients with kidney disease

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A virus that is present in most people in a latent state may induce or exacerbate anemia in patients with kidney disease, according to a study appearing in an upcoming issue of the *Journal of the American Society of Nephrology (JASN)*. The findings point to a new therapeutic target for affected individuals.

Chronic [kidney disease](#) (CKD) patients and [kidney transplant recipients](#) often develop anemia, or low levels of red blood cells. This is often because they do not produce enough [erythropoietin](#) (EPO), a hormone that is made in the kidney and stimulates production of red blood cells. Lynn Butler, PhD, Cecilia Söderberg-Naucler, MD, PhD (Karolinska Institute, in Stockholm, Sweden) and their colleagues wondered whether infection with cytomegalovirus (CMV), a type of [herpes virus](#) carried by approximately 70% of the population, might play a role in the development of anemia in these patients.

Most people carry CMV for life without any clinical symptoms because the immune system controls the infection; however, under some circumstances the virus can become active, replicate, and cause symptoms. The kidney is a target organ for CMV, and previous reports have shown that an active CMV infection is often present in transplanted kidneys.

Dr. Butler and her colleagues first looked to see if CMV could be detected in kidney biopsies from CKD patients and then investigated if, and how, the presence of such an infection could be linked to the

development of anemia.

The team discovered that kidneys from 9 of 13 CKD patients were positive for active CMV infection and that patients with higher levels of anti-CMV antibodies in their blood had lower number of [red blood cells](#).

Additional tests revealed that CMV infection inhibits the ability of cells to produce EPO and that it does this by preventing the production of a protein called hypoxia inducible factor (HIF2 $\alpha$ ).

"We have established a link between CMV infection and the development of [anemia](#) in [chronic kidney disease](#) patients. Thus, this virus could provide a target for therapeutic intervention," said Dr. Butler.

In an accompanying editorial, Michael Seifert, MD and Daniel Brennan, MD (Washington University at St. Louis) lauded the investigators for their thoroughness. "A major strength of this study is the authors' use of clinical observations, human biospecimens, animal models, and cell culture experiments to conduct true translational research that addresses an important question for clinicians," they wrote. "We applaud this innovative study," they added.

**More information:** The article, entitled "Human Cytomegalovirus Inhibits Erythropoietin Production," will appear online at [jasn.asnjournals.org/](http://jasn.asnjournals.org/) on April 10, 2014.

The editorial, entitled "Cytomegalovirus and Anemia: Not Just for Transplant Anymore," will appear online at [jasn.asnjournals.org/](http://jasn.asnjournals.org/) on April 10, 2014.

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