

Study sheds light on connection between metabolism and fatigue after Crimean-Congo fever

September 7 2023, by Christina Sundqvist



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Crimean-Congo hemorrhagic fever virus (CCHFV) spreads via ticks and is on the World Health Organization's (WHO) list of priority diseases,

with a high case fatality rate and no or insufficient countermeasures. A recent study published by researchers from Karolinska Institutet in collaboration with Sivas Cumhuriyet University, Turkey, sheds light on the connection between CCHFV infection and prolonged fatigue.

The study examining the acute stages of CCHFV infections has revealed a crucial link between the virus, metabolic imbalance, and the debilitating exhaustion that afflicts some individuals long after their recovery.

"Our study not only offered insights into the progression of the CCHFV infection itself but also unveiled the intricate relationship between the virus and our body's energy and carbon metabolism," says Ujjwal Neogi, senior author and virologist at the Department of Laboratory Medicine.

The research, led by a team of experts in virology and [computational biology](#), aimed to shed light on the underlying mechanisms contributing to the prolonged fatigue experienced by a subset of patients who have battled viral illnesses. The findings, published in the *Proceedings of the National Academy of Sciences (PNAS)*, could pave the way for improved treatments and support for those grappling with the aftermath of viral infections.

By investigating the genetic activity of blood samples collected from CCHFV patients at various stages of their illness, the scientists could discern significant metabolic fluctuations during the active phases of infection.

Prof. Nazif Elaldi from Sivas Cumhuriyet University, Turkey, chief physician scientist in the study, says, "The exhaustion that follows viral infections has long puzzled medical professionals. Our research indicates that the disruption in metabolism caused by CCHFV infection could be a driving force behind the development of post-viral fatigue syndrome. "

Hopes of better quality of life

The significance of these findings extends beyond CCHFV. The study lays the groundwork for a more comprehensive understanding of post-viral fatigue syndrome across various viral illnesses by unraveling the intricate link between viral infection and metabolic changes. This newfound knowledge could lead to the development of tailored interventions and treatments to address the lingering fatigue that impedes the quality of life for countless individuals.

Dr. Anoop Ambikan, a computational biologist involved in the study, emphasized the [holistic approach](#) taken in the research. "We created comprehensive models that allowed us to track the metabolic changes at different stages of the [infection](#)—from acute onset to early recovery and even post-recovery. This multi-dimensional analysis provided invaluable insights into the progression of the disease and the body's responses."

As the study primarily focused on patients with non-severe CCHFV infections, the research team acknowledges the need to expand their investigations to include a broader spectrum of severe cases

"Our study had limitations due to the high mortality rate among severe patients. We intend to recruit a larger sample size, including those who have survived severe disease, to refine our understanding of recovery processes further," Dr. Neogi said.

More information: Anoop T. Ambikan et al, Systems-level temporal immune-metabolic profile in Crimean-Congo hemorrhagic fever virus infection, *Proceedings of the National Academy of Sciences* (2023). [DOI: 10.1073/pnas.2304722120](https://doi.org/10.1073/pnas.2304722120)

Provided by Karolinska Institutet

Citation: Study sheds light on connection between metabolism and fatigue after Crimean-Congo fever (2023, September 7) retrieved 29 April 2024 from

<https://medicalxpress.com/news/2023-09-metabolism-fatigue-crimean-congo-fever.html>

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