Researchers exploring long-term effects of COVID-19 in diabetics

November 18 2022, by Christin Senior

Dr. Dinender Singla has spent much of his research career studying heart failure, diabetes and inflammation. Credit: University of Central Florida

Can a COVID-19 infection have long-term health effects on people with diabetes, including advancing their risk for heart disease?

College of Medicine researcher Dr. Dinender Singla believes that the genetic makeup of patients with diabetes or those predisposed to the disease makes them more prone to post-COVID inflammatory conditions that impact the heart and brain.

"We believe that COVID-19 can alter a person's genetic makeup which can enhance the proliferation of disease and cause further deterioration in diabetes and associated heart disease," explained Dr. Singla, who is the AdventHealth Chair of Cardiovascular Science at the College of Medicine.

Dr. Singla has spent much of his research career studying heart failure, diabetes and inflammation. In a recent article published in the *American Journal of Physiology–Heart* and *Circulatory Physiology,* he examined the mechanisms and possible effects of COVID-19 on patients with high-risk diabetes and the virus' potential to advance the disease, leading to inflammation and heart failure.

"Our thinking is COVID-19 could have three major long-term effects on patients,Dr. Singla noted. "One is cognitive dysfunction, which can lead to Alzheimer's disease. Second, it can enhance diabetes in pre-diabetic patients or pre-diabetic conditions. Third, it can exacerbate complications of diabetes such as cardiomyopathy or muscle dysfunction."

Dr. Singla theorizes that some diabetic patients who were infected with COVID-19 may have developed a different cellular composition in their blood compared to diabetic patients who never had COVID. The next step in his research is to analyze specific cellular differences in diabetics with and without a COVID infection.

"Our goal is to look into whether there is a difference in blood composition or variations in cytokines—proteins that affect

communications between cells—compared to the non-COVID diabetic patients," Dr. Singla said. "If any differences are noted, then we would need to examine what kind of diseases they could potentially cause or enhance in those patients."

COVID-19 has affected more than 600 million people worldwide, and because vaccines have made the virus not as alarming today as it was two years ago, Dr. Singla said there are still many unanswered questions about COVID's long-term impact on health.

"For example, if someone was genetically predisposed to developing heart disease or Alzheimer's disease, if that person is affected by COVID-19, will that person develop heart disease or Alzheimer's earlier than they were predisposed to?" Dr. Singla said. "Also how severe will their disease be and will it be different in people who contracted or did not have COVID-19?"

Dr. Singla said he is currently working on securing funding to explore the unanswered questions left in the wake of the virus.

"We want to know will diabetes be present in patients infected with COVID-19 10 or 20 years from now?" Dr. Singla said. "Will they develop a special type of cardiomyopathy or diabetic muscle pain and will those diseases be much more in enhanced? Having this information will allow us to be one step ahead in developing therapeutics and treatments to manage any variations of diseases that may occur."

More information: Chandrakala Aluganti Narasimhulu et al, Mechanisms of COVID-19 pathogenesis in diabetes, *American Journal of Physiology-Heart and Circulatory Physiology* (2022). DOI: 10.1152/ajpheart.00204.2022

Provided by University of Central Florida