Study finds metformin reduced COVID-19 death risks in women

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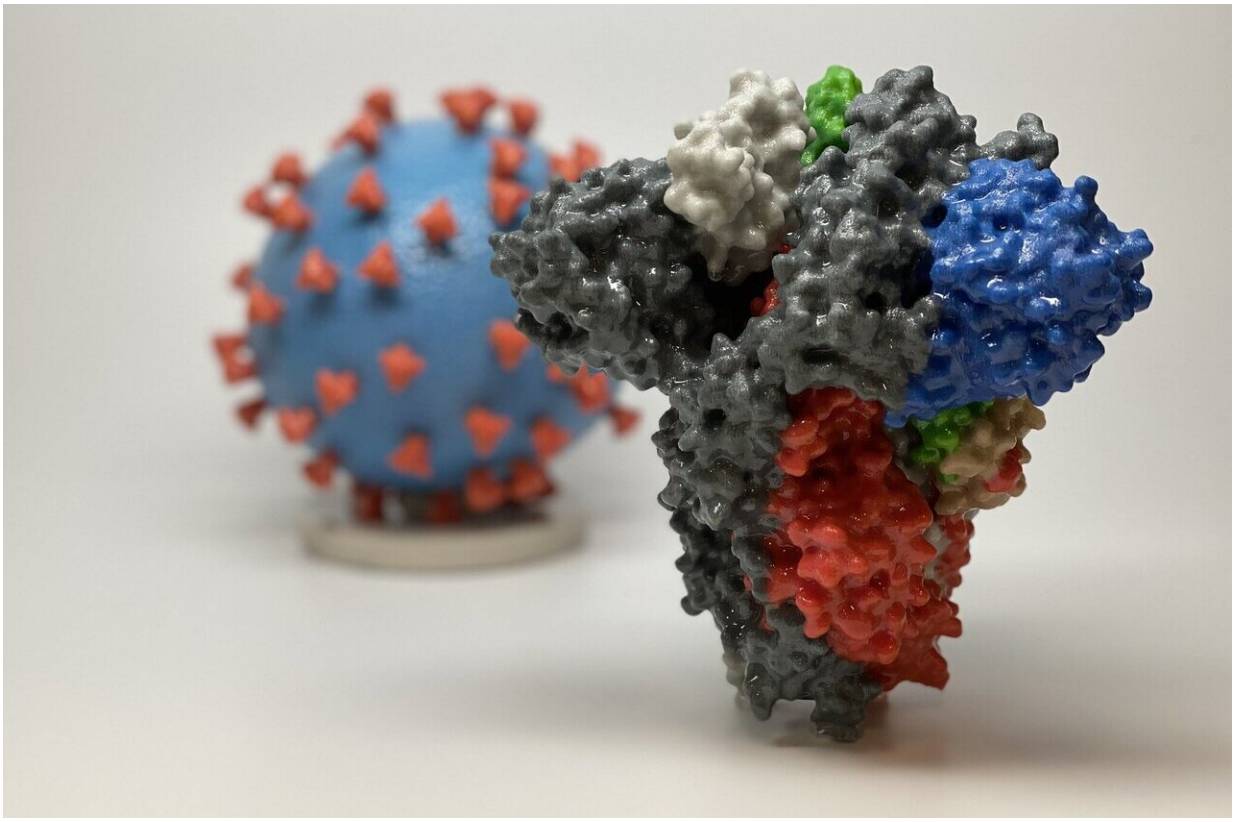

3D print of a spike protein of SARS-CoV-2, the virus that causes COVID-19—in front of a 3D print of a SARS-CoV-2 virus particle. The spike protein (foreground) enables the virus to enter and infect human cells. On the virus model, the virus surface (blue) is covered with spike proteins (red) that enable the virus to enter and infect human cells. Credit: NIH

University of Minnesota Medical School and UnitedHealth Group researchers found that metformin was associated with significantly reduced COVID-19 death risks in women in one of the world's largest observational studies of COVID-19 patients.

Metformin is an established, generic medication for managing blood sugar levels in patients with type 2 diabetes. It also reduces inflammation proteins like TNF-alpha that appear to make COVID-19 worse.

The study, published in *The Lancet Healthy Longevity,* is a retrospective cohort analysis based on de-identified patient data from UnitedHealth Group. The team analyzed about 6,000 individuals with type 2 diabetes or obesity who were hospitalized with COVID-19 and assessed whether or not metformin use was associated with decreased mortality. They found an association that women with diabetes or obesity, who were hospitalized for COVID-19 disease and who had filled a 90-day metformin prescription before hospitalization, had a 21% to 24% reduced likelihood of mortality compared to similar women not taking the medication. There was no significant reduction in mortality among men.

"Observational studies like this cannot be conclusive, but contribute to growing bodies of evidence. Seeing a bigger association with protection in women over men may point towards inflammation reduction as a key way that metformin reduces risk from COVID-19. However, more research is needed," said principal investigator Carolyn Bramante, MD, MPH, who is an assistant professor in the Department of Medicine at the University of Minnesota Medical School. "A large database covering different geographic areas is rarely available. We were fortunate to have the opportunity to do this research alongside UnitedHealth Group."

"While effective therapies to mitigate the harm of the SARS-CoV-2 virus are being developed, it is important that we also look to, and

evaluate commonly used medications with good safety profiles for their potential to combat the virus," said Deneen Vojta, MD, executive vice president, Enterprise Research and Development, UnitedHealth Group.

The results provide new directions for research against COVID-19. In collaboration with Christopher Tignanelli, MD, assistant professor in the Department of Surgery at the University of Minnesota Medical School, Bramante submitted an investigational new drug application to the Food and Drug Administration for use of metformin for COVID-19 treatment and prevention. The FDA approved this application. Bramante and Tignanelli received a donation from the Parsemus Foundation to conduct a multi-site prospective, randomized pilot study in collaboration with the Executive Director of Clinical Research for UnitedHealth Group R&D, Ken Cohen, MD. This pilot trial will begin enrolling the week of Dec. 8 and will lead into a larger trial that is fully powered for important clinical outcomes if additional funding becomes available. These collaborators are still seeking this funding.

More information: Carolyn T Bramante et al, Metformin and risk of mortality in patients hospitalised with COVID-19: a retrospective cohort analysis, *The Lancet Healthy Longevity* (2020). DOI: 10.1016/S2666-7568(20)30033-7

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