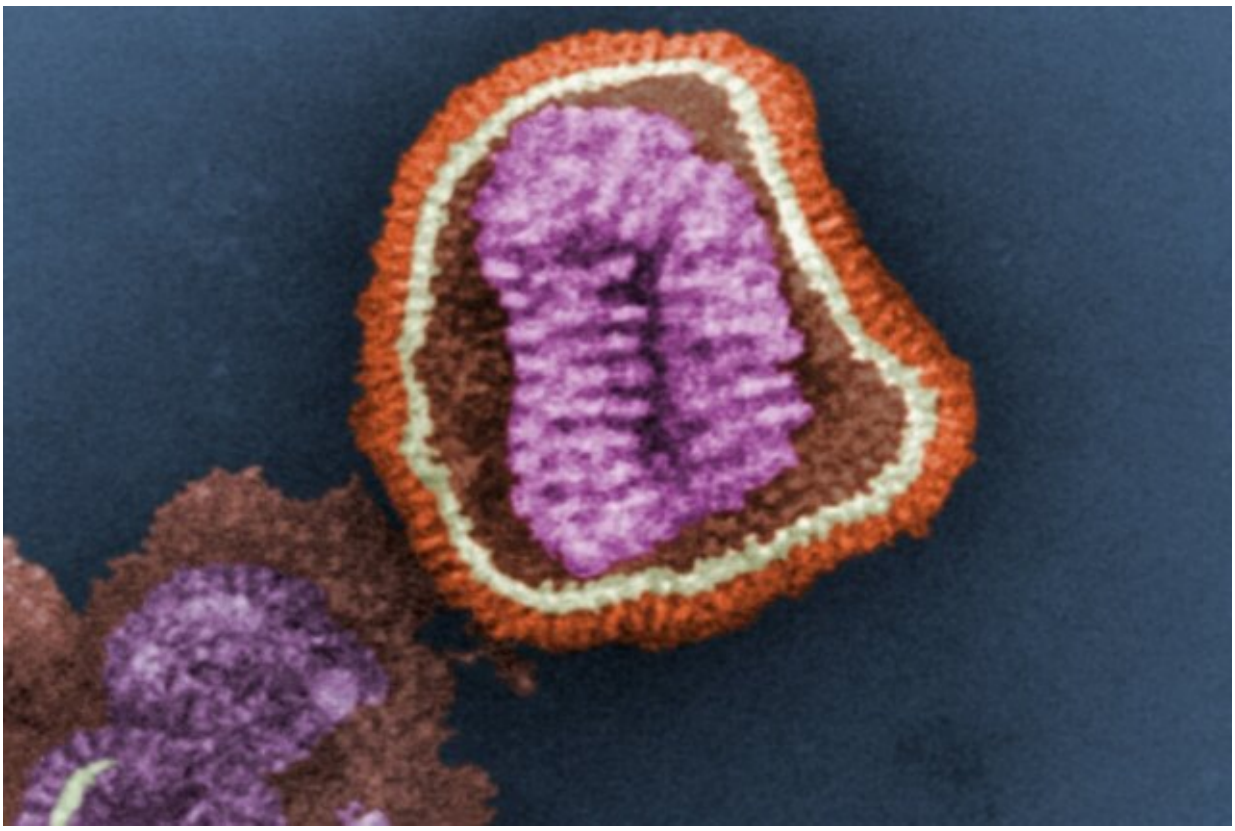
Users of blood pressure medicine have a lower risk of dying from influenza and pneumonia

October 2 2020



This digitally-colorized transmission electron microscopic image depicts the ultrastructural details of an influenza virus particle. Credit: CDC, Frederick Murphy

Drugs to lower blood pressure, specifically ACE inhibitors or angiotensin II receptor blockers, reduce the mortality rate of influenza and pneumonia.

This is the main conclusion of a new reassuring study published in the *Journal of the American Heart Association*, which Christian Fynbo Christiansen and a number of Danish colleagues are behind. He is consultant, clinical associate professor and Ph.D. at the Department of Clinical Epidemiology, which is part of the Department of Clinical Medicine at Aarhus University and Aarhus University Hospital in Denmark.

In the study, the researchers have compared mortality rates among 500,000 Danish patients who were admitted to hospitals in Denmark with influenza and pneumonia during the period 2005 to 2018. This has been done by correlating information from the National Patient Register (activity at Danish hospitals) with statistics from the Danish Register of Medicinal Products (the consumption of medicine in Denmark).

"A little over 100,000 of the admitted patients took ACE inhibitors or angiotensin II receptor blockers, and the study shows that fewer of them were put on a ventilator and that they had lower mortality rates than the hospitalized patients who took another type of drugs against elevated blood pressure, calcium blockers," says Christian Fynbo Christiansen.

The study arrives midway in a discussion of treatment which peaked while the corona pandemic was at its height. Some medical doctors and researchers pointed out that ACE inhibitors may actually have the completely opposite effect—that is increasing the risk of dying from COVID-19 as the virus SARS-CoV-2 which causes COVID-19 enters the lungs through the same ACE receptors as the ACE inhibitors.

The hypothesis was that when the ACE inhibitor reduces the level of

ACE, the body compensates for this by activating a much greater number of ACE receptors on the surface of the cells, which the SARS-CoV-2 virus then utilizes as some kind of access key. The greater the number of access keys available on the surface of the cells, the more easily the virus gains access to the cells.

The theory about increased mortality has been nurtured by the fact that a strikingly large proportion of the patients who were seriously ill due to COVID-19 had elevated blood pressure, which is extensively treated with ACE inhibitors—of the 600,000 Danes who have elevated blood pressure, approximately one-third (200,000) of them take ACE inhibitors.

"We haven't examined whether what applies to patients with influenza and pneumonia can be transferred directly to patients with COVID-19, but there is some evidence to suggest that ACE inhibitors have a protective effect against lung damage which we don't see in patients who take other types of medicine to lower blood pressure. The first studies find no correlation between ACE inhibitors/angiotensin II receptor blockers and COVID-19. However, further studies are needed using the good Danish registers," says Christian Fynbo Christiansen.

In Denmark, the discussion for and against the use of ACE inhibitors on corona patients has taken place (in Danish) in e.g. the Journal of the Danish Medical Association and another healthcare newspaper Dagens Medicin under headlines such as "ACE inhibitors possibly increase the risk of dying of COVID-19."

More information: Christian Fynbo Christiansen et al, Renin–Angiotensin System Blockers and Adverse Outcomes of Influenza and Pneumonia: A Danish Cohort Study, *Journal of the American Heart Association* (2020). DOI: 10.1161/JAHA.120.017297

Provided by Aarhus University