Correlation between the use of statins and COVID-19: what do we know?

Antonio Vitiello ,[1] Raffaele La Porta,[2] Francesco Ferrara[1]

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[1]Pharmaceutical Department, USL 1 Umbria, Perugia, Italy
[2]Clinical Pathology Department, AV1 Asur Marche, Urbino, Italy

Correspondence to:
Dr Antonio Vitiello,
Pharmaceutical Department, USL 1 Umbria, Perugia 06121, Italy; antonio.vitiello2@uslumbria1.it

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The COVID-19 global pandemic caused by the new Coronavirus SARS-CoV-2 represents a challenge for the health of humanity, with few precedents. The new Coronavirus SARS-CoV-2 (COVID-19) is the cause of severe acute respiratory syndrome (SARS), a severe form of viral pneumonia.[1] The virus spread rapidly from China to the rest of the world in a very short time and with considerable intensity and severity creating a 'global emergency'. Studies have shown that angiotensin-converting enzyme 2 (ACE-2) is the entry receptor of SARS-CoV-2 into host cells. Type II pneumocytes represent 83% of the cells expressing ACE-2 in the lung. ACE-2 receptor is also expressed in extrapulmonary tissues such as heart, brain, liver and kidneys. ACE-2 is an important regulatory enzyme in the renin–angiotensin system, catalysing the[2 3] conversion of angiotensin II (AT-II) to angiotensin 1–7 (AT 1–7). AT 1–7 opposes the effects induced by AT-II, with antioxidative stress, anti-inflammatory antifibrous and vasodilating actions. It is also known that SARS-CoV-2 infection in the most severe stages causes down-regulation of ACE-2. This effect can increase the likelihood of lung injury, which can be fatal in some cases. Ultimately, ACE-2 plays a double role in COVID-19 infection, the first as a protector against the damaging effects of hyperinflammatory response, the second as an entry receptor for SARS-CoV. In recent months, this has led the scientific world to investigate whether the use of drugs such as ACE inhibitors (ACEi) and angiotensin receptor blockers (ARB) may represent a COVID-19 risk factor, or on the contrary protective. Little has been said about the effects of statins to modify ACE-2 concentrations. Epidemiological studies have shown that advanced age and the presence of pre-existing comorbidities, such as cardiovascular disease, diabetes and dyslipidaemia, are COVID-19 risk factors.[4 5] Statins have been the first-choice therapy in the treatment of hypercholesterolemia for years. In addition to their effect of reducing LDL concentrations, known pleiotropic actions are attributed,[6] including antifibrotic and antifibrotic actions. Pulmonary fibrosis may be responsible for severe lung injury from COVID-19.[7] Some evidence associates pulmonary antifibrotic effects to statins.[8] Some studies have shown an increase in ACE-2 expression following treatment with statins.[9] As described, ACE-2 is the input receptor of SARS-CoV-2, but it also has a protective role against virus injury, especially in organs such as the lungs. Studies have shown that use of statins is associated with a reduced risk of mortality among individuals with COVID-19,[10] and current guidelines recommend not to discontinue routine statin treatment during COVID-19 infection. An advantage for statin treatment is protection against potential coronary endothelial dysfunction caused by SARS-CoV-2. However, some important questions remain to be clarified. If statins increase ACE-2, can they be a risk factor for SARS-CoV-2 infection? Or in severe stages of infection, does the increase in ACE-2 represent an additional protection value? But what are the real effects of statins on ACE-2? And again, if statins are used with ACEi or ARB therapy, can there be an additional effect on the modulation of ACE-2? And what clinical effects can there be? In conclusion, to date it is not clear how the clinical results in patients with COVID-19 are affected by the use of statins, alone or in combination with ACEi and ARB. Well-structured clinical studies are necessary.

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ORCID iD
Antonio Vitiello http://orcid.org/0000-0003-2623-166X

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