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

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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 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-19.6 Some evidence associates pulmonary antifibrotic effects to statins.6 Some studies have shown an increase in ACE-2 expression following treatment with statins.7 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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