STATINS

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Introduction

A recent meta-analysis showed that risk factors for severe and fatal cases include age over 65 years old, smoking, comorbidities such as hypertension, diabetes, and cardiovascular and respiratory diseases.[1,2,3] Most of these patients with comorbidities are already on statin therapy. Some studies have shown that statin use has been associated with favorable outcomes in patients with influenza and viral pneumonia.[3,4,5] The European Society of Cardiology guidance for the diagnosis and management of cardiovascular diseases during the COVID-19 pandemic does not discourage discontinuation of statins except in patients with severe rhabdomyolysis and increased liver enzymes.[5] Moreover, medical professionals in the Massachusetts General Hospital likewise recommend the continuation of statins in COVID-19 patients.[3]

Mechanism of Action

Statins are proven to be beneficial in patients with cardiovascular diseases, because of their anti-inflammatory and anti-oxidative stress actions besides their lipid-lowering activity.[4] They also modulate cell adhesion and migration, antigen presentation, and cytokine production. Moreover, statins can likewise downregulate proinflammatory transcription factors such as NF-Kb through inhibition of MYD88 pathway. In SARS-CoV infection, it has been determined that interaction of the virus with the toll-like receptors activates the NF-Kb which triggers inflammatory pathways.[3,4]

After entering the cells thru ACE2 receptors, SARS-CoV2 downregulates ACE2 expression causing unopposed angiotensin II accumulation which leads to organ injury. Statins are known to upregulate ACE2 via epigenetic modifications. An increase in the ACE2 might be beneficial to COVID-19 patients.[4]

Clinical Studies

Although currently there is no clinical evidence of the beneficial use of statins in COVID-19 patients, seven studies are underway.

Recommended Dose

Adults:	Atorvastatin 20-40mg once a day Rosuvastatin 20mg once a day Pravastatin 80mg once a day Simvastatin 80mg once a day
Pediatrics:	No data

Adverse Effects

Most statins undergo hepatic metabolism through CYP3A4. Concomitant intake of CYP3A4 inhibitors such as ritonavir and cobicistat in COVID-19 may cause muscle and liver toxicity. Liver injuries appear to be more common in severe COVID-19 cases according to studies. Therefore, starting statins at a lower dose is recommended in these instances, while monitoring the creatine kinase and transaminases.

Statins are generally safe medications with optimal tolerability profile, based on years of extensive clinical research and experience.[3,4]

Conclusion

Theoretically, statins may potentially benefit COVID-19 patients because their immunomodulatory effects were extensively studied in other diseases. They are relatively well-tolerated, affordable and widely available. However, given the lack of current evidence in COVID-19, their use as an immunomodulatory treatment is still inconclusive pending research results.

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