Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

Letter in response to the article: Pros and cons for use of statins in 59 people with coronavirus disease-19 (COVID-19)(Ray, S et al.)

Statins not only have the effects of lipid-lowering, anti-inflammatory and immune regulation, but also have been considered as an option for the treatment of COVID-19. Until now, a number of statins are on the clinical applications, including atorvastatin, lovastatin, fluvastatin, pravastatin, pitavastatin and simvastatin. Ray et al. envisaged statins use in people with COVID-19 might be beneficial [1]. In fact, several studies have shown that statins might reduce the risk of cardiovascular complications caused by COVID-19 and might potentially have an additional antiviral activity. Statins may also serve as potential SARS-CoV-2 main protease inhibitors, thereby contributing to the control of viral infection. However, the adverse effects of statins include muscle problems and the most important one being muscle pain. Statin-related muscle problems include myopathy, myalgias and rhabdomyolysis. The molecular mechanism of statin-induced muscle problems or muscle pain is still unclear.

Statins can be metabolized by cytochrome CYP3A4 (such as simvastatin, lovastatin and atorvastatin) or CYP2C9 (fluvastatin) [2]. Now, antiviral, and symptomatic treatments are still mainly adopted for COVID-19 treatment. And the most frequent therapies used to treat lung viral are antiviral and antibiotics. While dealing with COVID-19 patients on statins, we should take into account drug-to-drug interactions. In fact, many antiviral drugs, such as tiranavir, ritonavir, tranavir and other antiviral drugs, can significantly inhibit the biological activity of CYP3A4, thereby slowing down the degradation of statins, resulting in increased blood concentration and increasing the risk of myopathy. Macrolide antibiotics and antifungal drugs such as itraconazole, ketoconazole and posaconazole are also potent inhibitors of CYP3A4 [3]. Therefore, atorvastatin and cyclosporine, berberic acid, macrolide antibiotics, azole antifungal agents and nicotinic acid increase the risk of myopathy.

In addition, great individual differences were found in the occurrence of untoward reaction in statins therapy. In recent years, clinical studies indicated that individual differences are key to statins therapy [4]. Some protein polymorphism have been reported to be associated with the untoward reaction of statins. SNPs of proteins involved in signal pathways of steroid metabolic process and lipid transport were proved to be related to the curative effect of statins, thus affecting the efficacy and safety.

Therefore, the main challenge of statins in COVID-19 treatment strategy is the possibility of fatal adverse reactions caused by drug-drug interactions and the individual differences [5]. The use of statins should strictly screen patients with underlying diseases and control drug dosage to avoid drug-drug interaction. However, as discussed earlier, statins have been shown to reduce the risk of death and inflammation of COVID-19. Well designed clinical studies are essential to assess all potential limitations, taking into account key factors such as the type of statin, the dose of the combination therapy, the duration of treatment, and the patient's treatment plan. Further investigation is needed on the use of statins amongst patients with COVID-19 infections.

Declaration of competing interest

The authors declare that they have no conflict of interest.

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