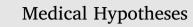


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Letter to Editors

As a potential treatment of COVID-19: Montelukast

ABSTRACT

It has been hypothesized that Montelukast, a cysteinyl leukotriene (cysLT) receptor antagonist, with effects of anti-inflammatory, suppress oxidative stress and reduce affect cytokine production, may limited progression of the disease on COVID-19 infection.

To the Editor:

The pandemia, emerged with the new coronavirus 2019 (COVID-19), has not yet been brought under control, despite serious measures taken all over the world and efforts to control and treat the disease. Up till now, a specific treatment for COVID-19 infection is not available. We believe that new approaches to treatment should be considered in cases of COVID-19. Here, the treatment approach of COVID-19 infection may include monteluksat, a cysteinyl leukotriene (cysLT) receptor antagonist, and the possibility of decrease severe COVID-19 progression will be mentioned.

The clinical process features of COVID-19 can range from asymptomatic cases to acute respiratory distress syndrome (ARDS) and multiorgan dysfunction. The disease can progress to pneumonia, respiratory failure and death when severe, and in this case, acute complications include acute lung injury, ARDS, sepsis and shock. This progression is thought to be related to excessive increase in proinflammatory cytokine levels [1,2].

In addition, as it is known, COVID-19 reaches the cell through angiotensin-converting enzyme (ACE) receptors and leads to severe pneumonia and thus increased mortality rates during infection by binding to human ACE2 [3,4]. The cough that can develop with ACE inhibition is caused by increased bradykinin and its bronchoconstrictor effect, and montelukast, a selective LTD4 antagonist, has an inhibitory effect on bradykinin-induced airway hypersensitivity [5,6]. Although it is unclear how this effect came about, it is thought to be through ACE receptors.

The most important cause of COVID-19 related deaths is respiratory failure, which is progressive and unresponsive to treatment [2,4]. ARDS, which frequently occurs in these patients, is an acute inflammatory lung injury, a clinical condition that is not well understood due to its complex pathogenesis, and is a result of widespread alveolar injury caused by intense inflammation. IL-6 and IL-8, the tumor necrosis factor (TNF) and IL-1 produced in the early phase and other pro-inflammatory cytokines that occur in the later stages of the disease, induce leukocyte migration to the region. Then, leukocytes accumulating in the lungs are activated and secretive reactive oxygen species and proteases that damage capillary endothelium and alveolar epithelium. Montelukast therapy has been shown in recent studies to reduce TNF- α , IL-6 and IL-1b levels [3,4]. The pronounced inhibitory effect of montelukast bradykinin-induced tracheal smooth muscle

https://doi.org/10.1016/j.mehy.2020.109828 Received 5 April 2020; Accepted 7 May 2020 0306-9877/ © 2020 Elsevier Ltd. All rights reserved. contraction has also been demonstrated, which supports the interaction between bradykinin and leukotriene mediators [3,6].

Montelukast is a potent cysteinyl leukotriene (cysLT) receptor antagonist with anti-inflammatory effects and has been proven to significantly suppress oxidative stress. Also, CysLTs can affect cytokine production. In high doses and i.v. administration of montelukast, IL-4, IL-5, IL-13 reduced protein expression in the lungs exerts its anti-inflammatory effect through the suppression of T-helper type-2 cytokines. Consequently, use of high-dose montelukast as an anti-inflammatory agent has been shown to be effective in acute asthma [7]. In addition, the use of montelukast is known to have a decreasing effect on the frequency and severity of wheezing in patients with clinical episodic wheezing (wheezing after an upper respiratory tract infection caused by adenovirus, influenza, metapneumovirus, coronavirus). In these patients, montelukast does not prevent these viral infections, but seems to limit the upper respiratory tract [5,8].

In the light of these informations, montelukast has an effect on events developing with ACE receptors, and also has an anti-inflammatory effect with bradykinin and leukotriene antagonism; Because of COVID-19 has entry into the cell through ACE receptors and caused mortality due to excessive inflammatory processes, it was thought that montelukast may have a limiting effect on the progression of the disease on COVID-19 infection. It suggests that it may be effective to use it, possibly at high doses, in order to reduce its severity during the course of the disease or before the disease occurs fully in people at risk. The healing effects of montelukast on these damages can be seen.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.mehy.2020.109828.

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