ACTA SCIENTIFIC NUTRITIONAL HEALTH (ISSN:2582-1423)

Volume 4 Issue 4 April 2020

Short Communication

Could Antihistamines Help in the Treatment and Spread of COVID-19 Via Re-Modulating Cytokines and by Reducing Sneezing?

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Received: March 20, 2020

Published: March 27, 2020

Keywords: COVID-19; Interferon-gamma; Antihistamine; Public Health; Cytokine

Coronaviruses are a large family of viruses [1]. The latest member of this family is termed the SARS-Cov-2 which causes COVID-19 [2]. Outbreaks of SARS-Cov-2 are now pandemic, given the toll of infections worldwide and the Covid-19 associated death rate [3]. All governments have been taken by surprise and have difficulty in knowing what to do to control COVID-19. No vaccine is currently available against the virus.

Here it is hypothesized that antihistamines could possibly provide highly beneficiary therapeutic effects regarding the SARS-Cov-2 infection. Given their mode of action, these drugs might relieve mild symptoms such as sneezing, runny nose and watery eyes associated with the infection related to COVID-19, as explained below.

Histamine has inflammatory and immunosuppressive effects [4] in addition to its proinflammatory actions [5]. The histamine molecule also inhibits release of a proinflammatory cytokine, namely the Tumor necrosis factor (TNF) in a dose-dependent manner [6]. Histamine can also inhibit the release of Interleukin (IL-1), IL-2, Interferon-gamma (IFN-γ), and TNF [6,7] and increase the release of IL-5 [8], IL-6 [9], and IL-8 [10]. Histamine also increases the synthesis and release of IL-10 from alveolar macrophages through prostaglandin E2 and nitric oxide production. It is known that IL-10 is an immunosuppressive and anti-inflammatory cytokine [11]. IL-10 inhibits the production of IL-1, IL-6, IL-8, IL-12, and TNF by activated macrophages [12] as well as that of IFN-γ by T helper cells [13].

IFN-γ is a unique cytokine that regulates both innate and adaptive immune pathways; possessing an antiviral function in the effective control of viral infections [6]. It is known that production of IFN-γ is inhibited by IL-10 in the presence of histamine. If this is so, release of histamine [14] can be prevented by antihistamines (such as Cetirizine, Brompheniramine, Clemastine, Loratadine etc.) so producing more IFN-γ and controlling the replication of the virus (COVID-19). Antihistamines can exert indirect antiviral effects on infected cells and neighboring cells and can control antiviral properties by modulating IL-1, IL-2, TNF, and especially IFN-γ. The depletion of IL-10, and then the over production of IFN-γ due to an antihistamine supply may have strong antiviral effects for COVID-19.

In summary, we believe that beside antiviral therapy, antihistamines might have a place in reducing deaths from COVID-19, working alongside antibiotics to eliminate secondary infections. It is possible that this could lead to the controlling of the spread of COVID-19. The theory at the moment is that the death rate is 3.4% from COVID-19 worldwide [15], including in countries with hot and humid weather. This means that COVID-19 is spreading regardless of weather conditions and it is not reasonable to wait for weather changes to control this virus before any vaccine is produced. However, we hope that antihistamines might help to delay the spread of the virus and could help to fight against COVİD-19 infections by modulating the immune system in the way described. Use of antihistamines might help in decreasing the spread of COVİD-19 containing droplets, helping to break the chain of transmission, if they are taken at the beginning or early phase of infection. Antihistamines may reduce patient coughing and nasal disease, cutting down on sneezing and adding to the reduction in disease transmission.

Acknowledgement

We are in deep sorrow for people who have lost their lives from COVID-19. We dedicate this manuscript to Dr. Li Wenliang, who was the first to announce COVID-19 infections to the world but passed away from the virus infection. We also thank BioMedES for the English editing without any charge.

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