

Is there a Relation between *Helicobacter pylori* and Covid-19?

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Abstract

Helicobacter pylori (*H. pylori*) is a gram-negative microaerophilic bacteria can cause gastric symptoms in addition to extra-gastrointestinal symptoms. Recently the novel SARS-CoV-2, the etiological agent for COVID-19, arrived from Wuhan, China leading to a global pandemic. Researches revealed that *Helicobacter pylori* increase the expression of angiotensin converting enzyme-2 receptors that are the binding receptors for SARS-CoV-2 to enter the cell. Therefore, this may increase the incidence of diarrhea and abdominal pain in *H. pylori* positive patients infected with covid-19. Furthermore, studies reported that *H. pylori* is inversely related to incidence and severity of asthma. Asthma may be a risk factor for severity of Covid-19. According, the previous factors, we can conclude that *H. pylori* might decrease the respiratory severity of Covid-19 in asthmatic patients. Studies are required to confirm this conclusion and to reveal if *H. pylori* can increase the expression of receptors in respiratory systems or not.

Keywords: *Helicobacter pylori*; Covid-19; Asthma; Angiotensin-Converting Enzyme-2

Abbreviations

H. pylori: *Helicobacter pylori*; GI: Gastrointestinal; ACE-2: Angiotensin-Converting Enzyme-2

Introduction

This review aims at providing inclusive information about the relation between *Helicobacter pylori* (*H. pylori*) infection and infection with COVID-19. It is obvious that the relation may be the common gastrointestinal (GI) symptoms between the two infections but researches revealed more than this relation.

The novel SARS-CoV-2 is the etiological agent for COVID-19. It arrived from Wuhan, China leading to a global pandemic. COVID-19 is known to affect respiratory and gastrointestinal systems and may cause pneumonia, diarrhea, vomiting and abdominal pain [1].

Helicobacter pylori is a gram-negative, micro-aerophilic gastric bacterium that colonize high percentage of the world's population. It can cause chronic active gastritis, peptic ulcer and unlikely may leads to gastric cancer. Moreover, *H. pylori* is responsible for many extra-gastrointestinal diseases [2].

I highlighted in this mini-review on the relation between *H. pylori* and novel Covid-19 virus.

***Helicobacter pylori* and SARS-CoV-2 receptors**

Angiotensin-converting enzyme-2 (ACE-2) is the binding receptor for SARS-CoV-2 to enter the cell. This receptor is widely expressed in the intestine. Therefore, Covid-19 cause gastrointestinal symptoms such as diarrhea and abdominal pain. Furthermore, *H. pylori* bacterium increases the expression of Covid-19 receptors in gastrointestinal systems. There entire aspects may increase GI symptoms associated with Covid-19 [3].

***Helicobacter pylori* and Covid-19 in asthmatic patients**

It is reported that *H. pylori* is inversely related to incidence and severity of asthma in humans [4].

The low prevalence of *H. pylori* infection in developed countries is associated with an increasing incidence of bronchial asthma. Reibman, *et al.* reported in their study that CagA positive *H. pylori* infection is inversely related with asthma and with a delay in the onset of asthma. They explained the effect of *H. pylori* as due to immune modifications [5].

As other infections affecting the lungs, asthma is considered a possible risk factor for severe COVID-19 [6].

In addition, a study published in *Nature Reviews Immunology* reported that asthma might increase susceptibility to severe Covid-19 [7].

On the other hand, there is a systematic review supported that asthma is not considered a significant premorbid condition in COVID-19 patients or may be a protective factor. But these findings were attributed to poor investigation and description of the pre-morbidities in COVID-19 patients and more mechanistic studies are required [6].

From the reasons mentioned above *H. pylori* can decrease the severity of Covid-19 in asthmatic patients.

Conclusion

Helicobacter pylori increase ACE 2 expression in GIT, which is the binding receptor for Covid-19. *H. pylori* positive patients have GI disorders if infected with Covid-19 than others. Asthma may exacerbate the Covid-19 infection and *H. pylori* inversely related to asthma. Therefore, *H. pylori* may decrease the hyper-inflammation and the mortality in asthmatic patients infected with Covid-19. Finally, future researches is required to reveal the accurate effect of asthma on Covid-19 and studies are needed to test the detailed relation between *H. pylori* and covid-19. Furthermore, studies are required to explore if there is a relation between *H. pylori* infection and expression of ACE receptors in the lung.

Conflict of Interest

Declare if any financial interest or any conflict of interest exists.

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