

Helicobacter pylori Infection and Asthma

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ABSTRACT

There is an indication of associated extragastric diseases such as asthma with *H. pylori* infection. Asthma is one of the most common chronic disorders in both childhood and adults, characterized with symptoms of wheezing and shortness of breath brought about by airway inflammation and obstruction. Complex human immune responses are involved in the pathogenesis of asthma. Meanwhile, *H. pylori* colonization seems to be effectively engaged. As result, *H. pylori* infection can provide protection against asthma. Optimistically, *H. pylori* status can be an informative biomarker for asthma especially in children. Detecting and applying the *H. pylori* effective molecules affecting the immune response to divert asthma can be an optimal point in current research.

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Key words: *Helicobacter pylori*; Asthma

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INTRODUCTION

At least 50% the world's population is infected with *Helicobacter pylori* (*H. pylori*), although only a minority of colonized individuals

develop severe digestive and extragastric disorders^[1]. It has been indicated that association of *H. pylori* and extragastric diseases is an area of clinical microbiology which remains to be elucidated^[2,3]. After the *H. pylori* colonization, a predominant activation of Th1 cells, with the subsequent production of IFN- γ , IL-12, IL-18, IL-23 and TNF- α , occur in human gastric cells. The aforementioned immune response is addressed in the current report to elucidate its role in the pathogenesis of *H. pylori*-associated asthma. Asthma is one of the most common chronic disorders in both childhood and adults, characterized with symptoms of wheezing and shortness of breath brought about by airway inflammation and obstruction^[4]. This chronic respiratory disease increases in importance as one considers that there are an estimated 300 million individuals affected worldwide. More recently, the severity and incidence of asthma in many developed countries has sharply increased^[5]. To date, there is no generally agreed rationale concerning this mysterious increase in incidence, although some reports suggest an inverse link between (*H. pylori*) colonization and occurrence of asthma. *H. pylori* is an indigenous resident in the human stomach; and among the bacterium has the strongest known modulation of the human immune system to suppress effective response to its own infection. *H. pylori* has been recognized as a persistent pathogen that causes gastric ulcer and gastric cancer. As a general concept, *H. pylori* infection can provide protection against asthma. This leads to the important ongoing question of whether we should infect people (including not previously colonized individuals) to prevent asthma or not. Broadly defined, those severe diseases induced by the *H. pylori* infections usually occur later in life, while asthma is considered as highly prevalent respiratory diseases in children. Collectively, we are confronted with a dilemma concerning the strategies about *H. pylori* treatment in the case of asthma patients. After 50,000 years of biologic co-evolution of human and *H. pylori* an ability to coexist seems definite. A partial answer might be to not target all *H. pylori* strains for elimination lifelong. It also may be beneficial to consider the balance between extragastric disease appearance and infectious agent^[5]. Hence, we can aim to deal with this problem according to the timing (early or later) in clinical symptoms. It is possible that we could first gain benefits from *H. pylori* colonization in childhood (Asthma prevention) and then later trying to eradicate it before peptic ulcers occurrence in adults.

Undoubtedly, more research is necessary to elucidate the exact mechanisms induced by *H. pylori* may prevent asthma development in children^[3]. Undoubtedly, more research is necessary to elucidate the exact mechanisms induced by *H. pylori* that may prevent asthma development in children. Meanwhile, others believe that eradication of *H. pylori* infection is strongly beneficial for curing peptic ulcer disease, gastric MALT lymphoma (Mucosa associated lymphoid tissue) and for the prevention of gastric cancer, and that it must be done in all *H. pylori*-infected patients, whether they are asthmatic or not. Research which reports the effects of *H. pylori* on the human immune system proposes trying to use them synthetically rather than as live bacterium. This can be a novel idea to be applied in the medical setting. Potentially, we could use this novel molecule to treat asthma patients, while available guidelines to eradicate *H. pylori* are still followed by clinicians and gastroenterologist. Optimistically, *H. pylori* status can be an informative biomarker for asthma especially in children. Overall, future research should continue to determine the exact mechanism which defines the less harmless *H. pylori* strains, which can be altered in children to prevent asthma, can help to manage this rouge gastroduodenal bacterium.

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