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Helicobacter Pylori and Alopecia Areata: A True Association or Coincidental Finding?

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ABSTRACT

Background: This article examines the possible correlation between *Helicobacter pylori* (*H. pylori*) infection and alopecia areata, a condition characterized by hair loss. Despite *H. pylori*'s conventional association with gastrointestinal problems, recent investigations have explored its potential links to autoimmune disorders, including alopecia areata. Early research suggested a higher prevalence of *H. pylori* in alopecia patients, but subsequent studies presented conflicting findings. Some studies measured H. pylori surface antigen (HpSag) in stool samples, yielding diverse outcomes. Another study used the urea breath test (UBT) and found a significant association between *H. pylori* and alopecia areata. A unique case demonstrated symptom control and disease remission following *H. pylori* eradication. However, the article highlights the inconclusive nature of existing research, the limitations of study designs and the absence of post-eradication data on alopecia symptoms.

Conclusion: The need for more advanced studies is emphasized, along with the importance of exploring therapeutic implications. The article concludes that while intriguing, the potential link between H. pylori and alopecia areata requires more comprehensive research, especially in diverse demographic groups, to gain a better understanding of its universality and broader implications.

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Introduction

Helicobacter pylori is a Gram-negative, microaerophilic bacillus commonly found in the human stomach (1, 2). *H. pylori* has a number of known gastrointestinal associations including type B gastritis, antral gastritis, peptic ulcers, gastric adenocarcinoma and gastric lymphoma (1). However, over the years research into the extraintestinal associations of *H. pylori* has yielded fascinating results ranging from its role in iron deficiency to diabetes mellitus to Alzheimer's disease (2). In addition, *H. pylori* has also been implicated in a number of autoimmune disorders including idiopathic thrombocytopenic purpura (ITP), multiple sclerosis, pemphigus, systemic lupus erythematosus (SLE), Sjögren syndrome and systemic sclerosis and vitiligo (3, 4). The association with other autoimmune diseases formed the basis for an investigation into the association between *H. pylori* and alopecia areata.

The earliest literature to support this association is the study by Tosti et al. (5). Tosti et al. (5) found a higher seroprevalence of *H. pylori* in a cohort of 68 patients of alopecia areata when compared with matched normal controls. However, the mere presence of IgG antibodies to *H. pylori* in patients of alopecia areata was not enough to conclude if such an association did actually exist and was not simply a coincidental finding secondary to past *H.* pylori exposure (5). This was followed by a similar study by Rigopoulos et al. (6) in which he took 30 patients of alopecia areata and a similar number of age- and sex-matched normal controls and compared the rates of IgG positivity for *H. pylori* in them. Contrary to the findings of Tosti et al. (5), Rigopoulos et al. (6) found no statistical significant difference between the seropositivity of both groups.

Abdel-Hafez et al. (7) conducted a study on 21 male and 10 female patients of alopecia areata and 24 age- and sex-matched healthy controls for the rate of *H. pylori* surface antigen (HpSag) prevalence in stool samples. They found HpSag positivity in 18 out of 31 of the alopecia patients (58.1%) and in 10 out of 24 controls (41.7%). While there is a greater rate of positivity in the alopecia group, this difference was found to be not statistically significant (7). This study measures a marker of current *H. pylori* infection and thus bypasses the limitation posed by Tosti et al. (5) and Rigopoulos et al. (6). El-Farargy et al. (8) conducted a study similar to Abdel-Hafez et al. (7) in which he compared 30 patients of alopecia areata with 20 age-matched and sex-matched apparently healthy controls for the rate of HpSag positivity in stool. Their results, however, contrasted from those of Abdel-Hafez et al. (7) as they found a highly significant difference in the rates of HpSag positivity between the two groups with 83% positivity in the patients and 35% positivity in the controls (8). Quantitatively, the difference in the mean HpSag levels between the two groups was significant as well (8). This was the first study which found a significant positive relationship between nail changes of alopecia areata and *H. pylori* disease duration (8). While HpSag levels did significantly correlate with alopecia duration, they did not significantly correlate with alopecia lesion severity (8).

Behrangi et al. (9) used the urea breath test (UBT) to detect *H. pylori* colonization in 81 patients of alopecia areata and 81 age- and sex-matched controls. UBT, while considered the gold standard method to diagnose *H. pylori*, has a similar sensitivity and specificity to the stool antigen detection test (10). Behrangi et al. (9) found that UBT positivity was present in 43 (53.1%) of the cases and 27 (33.3%) of the controls. This difference between the two groups was found to be statistically significant (9). The subjects were treated by a standard three drug regimen for 14 days, however, no data was collected post-treatment regarding alopecia symptoms or severity of alopecia (9). When the effects of age and sex were analyzed together as confounding variables, it was found that *H. pylori* was significantly associated with alopecia areata with an odds ratio of about 2.10 (9). However, sex alone was an insignificant factor in this relationship (9). Age alone, while a significant

factor, was inversely related with a younger age group showed a significantly better response (9).

Campuzano-Maya et al. (11) presented a case of alopecia areata who was found to be colonized by *H. pylori* on urea breath test and *H. pylori* IgG test. This patient was then treated by a standard three-drug regimen for two weeks and his alopecia was documented photographically at two week intervals. During this period the patient was not under any alopecia medications. *H. pylori* eradication was confirmed at six weeks by urea breath test (11). The patient showed dramatic improvement after the fourth week with hair regrowth in the beard and scalp and complete and sustained remission at week 44 (11). This is the only study to date that has shown symptom control and disease remission following *H. pylori* eradication (11).

The meta-analysis by Lee et al. (12) took into account the studies by Rigopoulos et al. (6), Abdel-Hafez et al. (7) and Behrangi et al. (9) and found that *H. pylori* has a significant positive relationship with alopecia areata with an odds ratio of about 2 and a mean prevalence of 62.8% (12).

However, the limitations of predominantly case-control study designs highlights the need for higher-order studies, including cohort studies and controlled trials. Additionally, the lack of post-eradication data on alopecia symptoms in studies poses a challenge in understanding the therapeutic implications of this association. Further research in diverse demographic groups, particularly children, is warranted to explore the universality of this potential link and its broader implications.

Conclusion

In conclusion, the investigation into the link between *H. pylori* and alopecia areata has generated intriguing yet inconclusive results. Early studies presented conflicting findings, and subsequent research employing different methodologies yielded varied outcomes. Some studies reported a higher positivity rate in alopecia patients, while others found no statistically significant association. Unique perspectives emerged from studies measuring *H. pylori* surface antigen (HpSag) and utilizing the urea breath test (UBT), with some indicating a potential link and others presenting mixed results. Overall, while the existing literature hints at a possible association, a more comprehensive understanding of the therapeutic utility of the relationship awaits more distinct research approaches.

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Ethics approval and consent to participate

This study did not require an ethics license.

Conflict of interest

Not applicable.

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