Int J Biol Med Res. 2025; 16(4): 8280-8282

Contents lists available at BioMedSciDirect Publications

International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Short Report

The Role of Probiotics as an Adjunct Therapy in Helicobacter pylori Eradication: Opportunities and Challenges

Shler Ali Khorsheed*

Department of Microbiology, Open Educational College, Kirkuk, Iraq

ARTICLEINFO

Keywords:
Helicobacter pylori,
probiotics,
adjunct therapy,
eradication,
antibiotic resistance,
gastrointestinal side effects,
Lactobacillus,
Bifidobacterium,
treatment adherence,
gut microbiota

ABSTRACT

The bacterium *Helicobacter pylori* is recognized as a widespread contributor to gastrointestinal illnesses across the globe. It plays a key role in the development of disorders such as stomach and duodenal ulcers, persistent gastric inflammation, and has also been linked to the progression of stomach cancer. Treatment protocols aimed at eliminating the infection typically employ a combination of antibiotics alongside proton pump inhibitors (PPIs), which aid in reducing stomach acid and enhancing the antibiotics' effectiveness. Despite this, the rise in antibiotic-resistant H. *pylori* strains poses a growing challenge, diminishing the success of conventional therapies and prompting the search for more effective treatment alternatives.adverse gastrointestinal effects, and poor patient adherence continue to hinder treatment success. In recent years, probiotics have gained attention as a potentialsupportive treatment in managing *H. pylori* infection aiming to improve clinical outcomes and reduce side effects. Probiotics, especially strains from the *Lactobacillus* and *Bifidobacterium genera,* have shown a*ntimicrobial* activity against *H. pylori*, as well as immunomodulatory effects that enhance mucosal defense mechanisms. Clinical studies suggestthat incorporating probiotics into.that incorporating probiotics into.Using a quadruple drug regimen may lead to a slight improvement in eradication success, while notably reducing frequent adverse effects like diarrhea, nausea, and bloating This improved tolerability may, in turn, enhance treatment adherence. Despite promising findings, several challenges remain. The effectiveness of probiotics appears to be strain-specific, and variations in dosage, duration, and combinations across studies make it difficult to establish standardized recommendations. Furthermore,The processes through which probiotics provide positive impacts against *H. pylori*.

© Copyright 2025 BioMedSciDirect Publications IJBMR -ISSN: 0976:6685.

Introduction

The bacterium *H. pylori* is a spiral, gram-negative bacterium that inhabits the lining of the human stomach and is associated with various digestive system conditions, such as chronic inflammation of the stomach (gastritis) and peptic ulcer diseaseMALT lymphoma and stomach cancer are among the serious diseases linked to *H. pylori* infection[1]. This bacterium affects close to 50% of people worldwide and continues to pose a major health challenge, especially in low- and middle-income regions where the prevalence of infection is notably high[2]. Current first-line treatment strategies typically consist of triple or quadruple therapy regimens that includeadministration of PPIs in conjunction with a blend of antibiotics including clarithromycin, amoxicillin, or metronidazole[3,4,5]. However, the effectiveness of these treatments has declined over recent years due to rising antibiotic resistance, poor patient compliance, and undesirable side effects like stomach pain,diarrhea and nausea[6,7,8].

Corresponding author:

Shler Ali Khorsheed*
Department of Microbiology,
Open Educational College, Kirkuk, Iraq

Email:shler-ali@uokirkuk.edu.iq

© Copyright 2025 BioMedSciDirect Publications IJBMR -ISSN: 0976:6685.

These limitations have prompted the exploration of alternative or adjunctive therapeutic options.The use of probiotics, which are live organisms capable of providing health advantages when ingested in the right amounts, has become increasingly popular. considerable interestbecause of their prospective involvement inimproving *H. pylori* eradication outcomes. Specific strains, particularly from the *Lactobacillus* and *Bifidobacterium genera*, exhibit antibacterial activity againstH. pylori, reinforce mucosal protection, and play a role in immune regulation[9,10,11].].

As adjuncts to standard eradication therapy, probiotics may help reduce treatment-related side effects, improve patient adherence, and potentially enhance eradication rates[12,13,14]. This paper explores the opportunities and challenges associated with usingthe use of probiotics as a complementary treatment for *H. pylori* infection. with a focus on current evidence, underlying mechanisms, and areas requiring further investigation[15,16,17].

DISCUSSION

The persistence of *Helicobacter pylori* as a global public health issue is attributed to itsits established association with peptic ulcers, chronic gastritis, and gastric malignancies. Although standard eradication therapytypically comprising.Although treatment with a proton pump inhibitor (PPI) combined with antibiotics has proven effective, its overall success is being progressively undermined by various challengesmost notably, the growing prevalence of antibiotic resistance.resistance, gastrointestinal side effects, and poor patient adherence, all of which hinder treatment outcomes and increase the risk of persistent infection and complications [18,19].

In this context, probiotics have emerged as a promising adjunctive approach aimed at enhancing eradication efficacy while minimizing adverse effects. Clinical and experimental evidence indicates that specific

probiotic strains, particularly from the *Lactobacillus* and *Bifidobacterium* genera, exhibit direct antimicrobial effects against *H. pylori*, in addition to immunomodulatory properties that strengthen mucosal defense mechanisms [20-21].A wide range of randomized controlled studies and meta-analytical reviews have shown that incorporating probiotics into conventional triple or quadruple therapy regimens can be beneficial. regimens leads to a modest but statistically significant improvement in eradication rates,and more importantly, a notable reduction in common treatment-relatedgastrointestinal side effects like diarrhea, nausea, bloating, and discomfort in the abdomen[22].

This reduction in side effects may, in turn, contribute to improved treatment adherence, a critical determinant of eradication success. However, despite these encouraging outcomes, several challenges must be addressed before probiotics can be routinely integrated into standardized *H. pylori* treatment protocols. A major limitation is that probiotic efficacy appears to be strain-specific, with considerable heterogeneity in study designs, dosage, duration, and formulation.

Furthermore, the precise mechanisms by which probiotics exert their therapeutic effects remain incompletely understood, warranting deeper investigation intotheir interplay with the host's immune defenses and the stomach's microbial community[23,24].In conclusion, probiotics represent a valuable adjunct to conventional eradication therapy, particularly in improving patient tolerance and potentially boosting clinical outcomes. While they are unlikely to replace antibiotics, their supportive role offers a promising avenue for a more patient-centered, tolerable, and effective *H. pylori* management strategy. Further large-scale, high-quality randomized trials are essential to establish standardized recommendations regarding strain selection, dosage, and treatment duration[25].

CONCLUSION

Infection with *Helicobacter pylori* continues to be a major worldwide health concern because it is linked to severe digestive disorders including peptic ulcers, chronic inflammation of the stomach lining, and stomach cancer. Standard treatment approaches generally involve a combination of proton pump inhibitors and antibiotics.have demonstrated effectiveness, their long-term success is increasingly undermined by rising antibiotic resistance, adverse gastrointestinal side effects, and poor patient adherence. In response to these limitations, probiotics have emerged as a promising adjunctive therapy.

Specific strains, especially from the species from the *Lactobacillus* and *Bifidobacterium* genera have demonstrated the capacity to inhibit the proliferation of *H. pylori*.improve mucosal immunity, and reduce treatment-related side effects such as diarrhea and nausea. These benefits contribute not only to enhanced patient comfort but also to improved compliance with eradication protocols. Although probiotics are not a replacement for antibiotics, the evidence suggests they can play a valuable supportive role in optimizing eradication outcomes.

However, the strain-specific nature of their effects, along with variations in dosage and administration, calls for further research to establish standardized guidelines. In conclusion, integrating probiotics into *H. pylori* eradication strategies holds substantial potential to enhance treatment efficacy and tolerability. Future large-scale, Robustly designed trials are essential to verify their therapeutic value and determine the best practices for their application in clinical contexts.

REFERENCES

[1] Shler A K (2024). Isolation and Diagnosis of the Bacteria Causing Gastric Ulcers and Identification of the Causative Gene using PCR Technique. *International Journal of Current Microbiology and Applied Sciences. 13(09). 1-11.*

[2] Shler A K (2024). A Comparative Study of Serological and Stool Antigen Tests for *Helicobacter pylori* Infection Diagnosis. *Angiotherapy Journal.8(4), 1-6.*

[3] Chey WD, Leontiadis GI, Howden CW, Moss SF.) 2017("ACG Clinical Guideline: Treatment of *Helicobacter pylori* Infection." *Am J Gastroenterol.;*112(2):212-239

[4] Malfertheiner P, et al.)2022(.Management of *Helicobacter pylori* infection the Maastricht *VI/Florence Consensus Report. Gut.*;71(9):1724-1762.

[5] WGO. "*Helicobacter pylori* in Developing Countries." (2022) Update.

[6] Omar, E. M. (2022). Management of *Helicobacter pylori* infection—the Maastricht VI/Florence Consensus Report. *Gut,* 71(9), 1274–1762.

[7] FitzG R, Smith SM. (2021).An overview of *Helicobacter pylori* infection. In: Smith SM, editor. *Helicobacter pylori*. Springer US, New York, NY. p. 1–14.

[8] Hooi JKY, Lai WY, Ng WK, SuenMMY,Underwood FE, Tanyingoh D, et al. ,(2017). Global prevalence of *Helicobacter pylori* infection: systematic review and meta-analysis. *Gastroenterology.* 153:420–9.

[9] Guyatt GH, Oxman AD, Vist GE et al.) 2008(.GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. BMJ;339:924–926.

[10] Opekun AR, Gilger MA, Denyes SM *et al*.(2000). *Helicobacter pylori* infection in children of Texas. J PediatrGastroenterol Nutr;31:405–410.

[11] Schwarz S, Morelli G, Kusecek B et al.(2008). Horizontal versus familial transmission of *Helicobacter pylori*. *PLoS Pathog:*e1000.180.

[12] Hooi, J. K. Y. et al. (2017).Global prevalence of *Helicobacter pylori* infection: Systematic review and meta-analysis. *Gastroenterology*153, 420–429.

[13] shibangu-Kabamba, E. & Yamaoka, Y. (2021).*Helicobacter pylori* infection and antibiotic resistancefrom biology to clinical implications. Nat. Rev. *Gastroenterol. Hepatol*.18, 613–629.

[14] Chey, W. D., Leontiadis, G. I., Howden, C. W. & Moss, S. F. (2017). ACG clinical guideline: Treatment of *Helicobacter pylori* infection. *Am. J. Gastroenterol*.112, 212–239.

[15] Savoldi, A., Carrara, E., Graham, D. Y., Conti, M. &Tacconelli, E. Prevalence of antibiotic resistance in *Helicobacter pylori*: (2018). A systematic review and meta-analysis in World Health Organization regions. *Gastroenterology*155, 1372–1382.

[16] Shler A K (2024). Isolation and Diagnosis of the Bacteria Causing Gastric Ulcers and Identification of the Causative Gene using PCR Technique. *International Journal of Current Microbiology and Applied Sciences.* 13(09). 1-11.

[17] Shler A K (2024). A Comparative Study of Serological and Stool Antigen Tests for *Helicobacter pylori* Infection Diagnosis. Angiotherapy Journal. 8(4), 1-6.

[18] Malfertheiner, P., Megraud, F., Rokkas, T., et al. (2022). Management of *Helicobacter pylori* infection—the Maastricht *VI/Florence consensus report. Gut,* 71(9), 1742–1762.

[19] Zhou, L., Zhang, W., Zhao, Y., Wang, Y., & Li, J. (2024). Efficacy and safety of probiotics as an adjunct therapy for *Helicobacter pylori* eradication: A systematic review and meta-analysis. Scientific Reports, 14, 59399.

[20] Dang, Y., Reinhardt, J. D., Zhou, X., & Zhang, G. (2014). Probiotics as adjunctive therapy for *Helicobacter pylori* infection: A meta-analysis. Journal of Digestive Diseases, 15(8), 453-443.

[21] McFarland, L. V., Huang, Y. Y., &Moltzau Anderson, C. (2015). A randomized, placebo-controlled trial of a multi-strain probiotic in combination with triple therapy for eradication of *Helicobacter pylori*. Current Microbiology, 70(4), 483–490.

[22] Szajewska, H., Horvath, A., &Piwowarczyk, A. (2010). Meta-analysis: The effects of *Lactobacillus rhamnosus* GG supplementation for *Helicobacter pylori* eradication in children. *Alimentary Pharmacology & Therapeutics,* 32(9), 1069–1079.

[23] Goldenberg, J. Z., Ma, S. S. Y., Saxton, J. D., et al. (2015). Probiotics for the prevention of *Clostridium difficile* associated diarrhea in adults and children. Cochrane Database of Systematic Reviews, Issue 12.

[24] BMC Gastroenterology. (2021). Probiotics as the live microscopic fighters against *Helicobacter pylori* infection.

[25] Lü, M., Yu, S., Deng, J., Yan, Q., Yang, C., Xia, G., et al. (2016). Efficacy of Probiotic Supplementation Therapy for *Helicobacter pylori* Eradication: A Meta-Analysis of Randomized Controlled Trials. PLOS ONE, 11(10), p:163743.

© Copyright 2025 BioMedSciDirect Publications IJBMR -ISSN: 0976:6685.