



Is *Helicobacter pylori* Infection Prevalent in Middle East Countries?

Peiman Nasri^{1,2}, Hossein Saneian ^{1,2}, Fatemeh Famoori ^{1,2}, Majid Khademian ^{1,2} and Fatemeh Salehi^{3,*}

¹Metabolic Liver Disease Research Center, Emam Hosein Children's Hospital, Isfahan University of Medical Sciences, Isfahan, Iran

²Child Growth and Development Research Center, Research Institute for Primordial Prevention of Non-communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran

³School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

*Corresponding author: School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran. Email: dr.fatemehsalehi73@gmail.com

Received 2022 February 16; Accepted 2022 August 30.

Abstract

Background: *Helicobacter pylori* is a pathogenic bacteria found in the gastric mucosa of both children and adults. Our goal was to use an endoscopic method to look at the prevalence of *H. pylori* in children with gastrointestinal complaints.

Methods: This cross-sectional research was conducted in 2022 on pediatric patients who received gastric or duodenal biopsies by endoscopy. We collected data from medical reports regarding patients' age, gender, location of residence, type of gastrointestinal problems, and frequency of *H. pylori* infection.

Results: A total of 2030 pediatric patients participated in the study. *Helicobacter pylori* infection was found in 259 cases (12.76%). There were no significant differences between the two genders regarding the prevalence of *H. pylori* infection ($P = 0.094$). This infection was more common in patients aged > 10 years ($P < 0.001$) and in residents of the Isfahan suburb ($P < 0.001$).

Conclusions: In comparison to other locations, we found a similar incidence rate of *H. pylori* infection in children. According to our findings, greater ages are associated with a higher detection rate of *H. pylori* infection.

Keywords: *Helicobacter pylori*, Infection, Prevalence, Pediatrics, Endoscopy

1. Background

In both children and adults, *Helicobacter pylori* is a significant factor in the development of disorders such as chronic gastritis and gastric and duodenal ulcers (1). Although many patients with *H. pylori* have no clinical symptoms, this bacteria is a major cause of dyspepsia in adults and recurrent heartburn in children (2).

Developing countries have a higher prevalence of *H. pylori* than wealthy countries. According to reports, this virus is more common in Eastern Mediterranean countries than in European nations, where its incidence is less than 20% (3, 4). According to studies on the incidence of infection with *H. pylori* in Iran, statistical differences between different cities ranged from 17-9% to 82%. The frequency of infection with *H. pylori* in Iran is 54% (5-7).

The age of the population has an impact on the reported prevalence of this virus. In a study that included a systematic review, individuals under 20 had a prevalence of *H. pylori* of 50.3%, and those between 20 and 40 years had a prevalence of 60.1% (8). Different research has used different methods to measure *H. pylori* infection, and the methods have all produced useful results (9). Stool examination

is a common way of detecting *H. pylori* infection, and in industrialized nations, antibiotic therapy is started when the test is positive (10).

One factor contributing to overdiagnosis and unnecessary antibiotic treatment, which results in high costs and the emergence of antibiotic resistance, is the lack of particular clinical symptoms associated with childhood *H. pylori* infection (11). On the other hand, the patient is not treated asymptotically in underdeveloped nations where the prevalence of this virus is significant (12).

Helicobacter pylori infection appears to be uncommon in children with gastrointestinal issues, and early treatment will be beneficial in avoiding the chronic implications of this illness. Since there are no accurate statistics on the incidence of *H. pylori* in children in Isfahan, we chose to look at the prevalence of this infection in pediatric patients with gastrointestinal disorders.

2. Methods

This cross-sectional research was conducted in 2022 at Imam Hossein hospital, affiliated with Isfahan University of Medical Sciences, on pediatric patients who received

gastric or duodenal biopsies by endoscopy (Ethics code: IR.MUI.MED.REC.1399.300).

Patients under 18 with endoscopy for gastrointestinal problems, accompanying pathology findings in their medical records, and parental permission to participate in the study were all considered eligible. Incomplete patient data was the criteria for exclusion.

We collected data from medical reports regarding patients' age, gender, location of residence, type of gastrointestinal problems, and frequency of *H. pylori* infection. We also studied the potential association between *H. pylori* presence and patient complaints.

The obtained data were entered into the Statistical Package for Social Sciences (SPSS) version 24. P-value < 0.05 was considered as the significance threshold.

3. Results

A total of 2030 pediatric patients entered the study. The study population consisted of 897 girls (44.2%) and 1133 boys (55.8%) with a mean age of 6.4 ± 4.5 years. *Helicobacter pylori* infection was found in 259 cases (12.76%).

The age classification and place of residence are indicated in Table 1. As shown, most cases were residents of Isfahan city suburbs (48.2%).

Table 1. Frequency Distribution of Age Group and Place of Residence

Variables	No. (%)
Sex	
Male	1133 (55.8)
Female	898 (44.2)
Age group (y)	
< 1	310 (15.3)
2 - 6	762 (37.5)
7 - 10	542 (26.7)
> 10	417 (20.5)
Residence place	
Isfahan	929 (46.2)
Isfahan suburb	969 (48.2)
Khuzestan	11 (0.5)
Chaharmahal	87 (4.3)
Other	16 (0.8)

The chi-square test showed no significant differences between the two genders regarding the prevalence of *H. pylori* infection ($P = 0.094$). This infection was more common in patients aged > 10 years ($P < 0.001$) and the residents of the Isfahan suburb ($P < 0.001$) (Table 2).

Table 2. Frequency Distribution of *Helicobacter pylori* Infection by Sex, Place of Residence, and Age Group^a

Variables	Not Infected	Infected	P Value
Sex			
Male	1001 (88.3)	132 (11.7)	0.094
Female	770 (85.8)	127 (14.2)	
Age group (y)			
< 1	283 (91.3)	27 (8.7)	< 0.001
2 - 6	684 (89.8)	78 (10.2)	
7 - 10	459 (84.7)	83 (15.3)	
> 10	345 (82.9)	71 (17.1)	
Residence place			
Isfahan	828 (89.1)	101 (10.9)	< 0.001
Isfahan suburb	842 (86.9)	127 (13.1)	
Khuzestan	11 (100.0)	0 (0.0)	
Chaharmahal	67 (77.0)	20 (23.0)	
Other	11 (68.8)	5 (31.3)	

^aValues are expressed as No. (%).

4. Discussion

Pediatric *H. pylori* infection prevalence and associated variables may be of significant clinical significance, and regional investigations have produced a range of findings. In the current study, we assessed the pathology reports of 2030 children who underwent endoscopy because of gastrointestinal problems in Isfahan, Iran. According to our findings, *H. pylori* infection was discovered in 259 cases (12.76%), and it was more prevalent in older children.

In 2022, Nasri and colleagues recently evaluated data from 400 pediatric patients with gastrointestinal complications and reported that *H. pylori* infection was found in 7.8% of cases (13). These findings may be highly clinically significant, and pediatricians working in gastrointestinal clinics may use them. Earlier research was done in this area to assess the frequency and significance of this infection in kids. Many studies have examined the incidence of *H. pylori* in pediatric patients generally, and others have assessed symptomatic children. Oleastro and colleagues conducted research on 844 asymptomatic children in Portugal in 2011. They investigated the general infection rate for *H. pylori* in this study and found that the overall incidence of *H. pylori* infection was 31.6%, growing with age but remaining similar across genders (14). Based on this study, susceptibility testing before treatment has again been emphasized, and the high resistance of *H. pylori* and, subsequently, low eradication rates are still a serious worry (15).

Studies on gastrointestinal diseases and symptomatic

patients have revealed that *H. pylori* infection is a serious concern that must be recognized and treated as soon as possible. In 2015, Jozefczuk and colleagues investigated the incidence of *H. pylori* infection in children with celiac disease in Poland. Infection with *H. pylori* was found in 5.4% of children with celiac disease; however, the prevalence rate, gender distribution, and age groups were comparable between children with celiac disease and healthy patients (16). Our findings were consistent with these findings. Based on our data, 12.7% of pediatric patients with gastrointestinal issues have *H. pylori* infections.

In Belgium, a longitudinal research study evaluated the prevalence of *H. pylori* infection in children with symptoms identified by histology. The prevalence of *H. pylori* was 18.2% in children under the age of six and 49.3% in those between the ages of 12 and 17 (17). In 2014, Cai and colleagues showed that 20% of children with chronic gastritis are infected with *Helicobacter pylori*, a lower rate than in earlier research (18).

Ibrahim and associates conducted a review of research in 2017 that evaluated the relationship between sex and *H. pylori* infection in pediatric and adult populations. Male sex was linked to a higher prevalence of *H. pylori* infection in children and adults, according to their analysis of 244 research. Additionally, it was noted that children with gastrointestinal problems might have a prevalence of this infection that ranges from 5 to 15% (19). These results concur with our study's findings, which indicated a low prevalence rate based on the biopsy approach. We think further research should be done to determine the precise prevalence rate of *H. pylori* infection in symptomatic children before treating and giving antibiotics to children with positive stool exams or serology testing.

4.1. Conclusions

We found a similar incidence rate of *H. pylori* infection in children compared to other locations. According to our findings, greater ages are associated with a higher detection rate of *H. pylori* infection.

Footnotes

Authors' Contribution: Peiman Nasri contributed to the conception of the work, conducting the study, revising the draft, approving the final version of the manuscript, and agreeing to all aspects of the work. Hossein Saneian contributed to the conception of the work, drafting and revising the draft, approving the final version of the manuscript, and agreeing on all aspects of the work. Fatemeh Famoori contributed to analyzing or interpreting

data for the work, drafting or revising it critically for important intellectual content, and final approval of the version to be published. Majid Khademan contributed to drafting the work or revising it critically for important intellectual content, Final approval of the version to be published, and Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Fatemeh Salehi contributed Substantial contributions to the conception or design of the work, drafting of the work, Final approval of the version to be published, and Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of Interests: The authors have no conflict of interest.

Data Reproducibility: The data presented in this study are uploaded on DATE in Mendeley.

Ethical Approval: The study protocol was approved by the Research Committee of Isfahan University of Medical Sciences, and the Ethics committee has confirmed it (Ethics code: [IR.MUI.MED.REC.1399.300](https://doi.org/10.1007/978-3-319-30013-0)).

Funding/Support: There was no financial support for this study.

Informed Consent: The parents signed written informed consent to participate in this study

References

1. Crowe SE. *Helicobacter pylori* Infection. *N Engl J Med*. 2019;**380**(12):1158-65. [PubMed ID: [30893536](https://pubmed.ncbi.nlm.nih.gov/30893536/)]. <https://doi.org/10.1056/NEJMcpi710945>.
2. Burucoa C, Axon A. Epidemiology of *Helicobacter pylori* infection. *Helicobacter*. 2017;**22** Suppl 1. [PubMed ID: [28891138](https://pubmed.ncbi.nlm.nih.gov/28891138/)]. <https://doi.org/10.1111/hel.12403>.
3. Sjomina O, Pavlova J, Niv Y, Leja M. Epidemiology of *Helicobacter pylori* infection. *Helicobacter*. 2018;**23** Suppl 1. e12514. [PubMed ID: [30203587](https://pubmed.ncbi.nlm.nih.gov/30203587/)]. <https://doi.org/10.1111/hel.12514>.
4. Mezmale L, Coelho LG, Bordin D, Leja M. Review: Epidemiology of *Helicobacter pylori*. *Helicobacter*. 2020;**25** Suppl 1. e12734. [PubMed ID: [32918344](https://pubmed.ncbi.nlm.nih.gov/32918344/)]. <https://doi.org/10.1111/hel.12734>.
5. Leja M, Axon A, Brenner H. Epidemiology of *Helicobacter pylori* infection. *Helicobacter*. 2016;**21** Suppl 1:3-7. [PubMed ID: [27531531](https://pubmed.ncbi.nlm.nih.gov/27531531/)]. <https://doi.org/10.1111/hel.12332>.
6. Maleki I, Mohammadpour M, Zarrinpour N, Khabazi M, Mohammadpour RA. Prevalence of *Helicobacter pylori* infection in Sari Northern Iran; a population based study. *Gastroenterol Hepatol Bed Bench*. 2019;**12**(1):31-7. [PubMed ID: [30949317](https://pubmed.ncbi.nlm.nih.gov/30949317/)]. [PubMed Central ID: [PMC6441486](https://pubmed.ncbi.nlm.nih.gov/PMC6441486/)].
7. Moosazadeh M, Lankarani KB, Afshari M. Meta-analysis of the Prevalence of *Helicobacter Pylori* Infection among Children and Adults of Iran. *Int J Prev Med*. 2016;**7**:48. [PubMed ID: [27076886](https://pubmed.ncbi.nlm.nih.gov/27076886/)]. [PubMed Central ID: [PMC4809131](https://pubmed.ncbi.nlm.nih.gov/PMC4809131/)]. <https://doi.org/10.4103/2008-7802.177893>.
8. Ozbey G, Hanafiah A. Epidemiology, Diagnosis, and Risk Factors of *Helicobacter pylori* Infection in Children. *Euroasian J Hepatogas-*

- troenterol.* 2017;**7**(1):34–9. [PubMed ID: 29201769]. [PubMed Central ID: PMC5663771]. <https://doi.org/10.5005/jp-journals-10018-1208>.
9. Skrebinska S, Megraud F, Bessede E. Diagnosis of *Helicobacter pylori* infection. *Helicobacter.* 2018;**23** Suppl 1. e12515. [PubMed ID: 30203584]. <https://doi.org/10.1111/hel.12515>.
 10. Godbole G, Megraud F, Bessede E. Review: Diagnosis of *Helicobacter pylori* infection. *Helicobacter.* 2020;**25** Suppl 1. e12735. [PubMed ID: 32918354]. <https://doi.org/10.1111/hel.12735>.
 11. Iwanczak BM, Buchner AM, Iwanczak F. Clinical differences of *Helicobacter pylori* infection in children. *Adv Clin Exp Med.* 2017;**26**(7):1131–6. [PubMed ID: 29211362]. <https://doi.org/10.17219/acem/60581>.
 12. Ortiz-Princz D, Daoud G, Salgado-Sabel A, Cavazza ME. *Helicobacter pylori* infection in children: should it be carefully assessed? *Eur Rev Med Pharmacol Sci.* 2016;**20**(9):1798–813. [PubMed ID: 27212173].
 13. Nasri P, Saneian H, Famouri F, Khademian M, Salehi F. *Helicobacter pylori* infection in pediatrics with gastrointestinal complaints. *Int J Physiol Pathophysiol Pharmacol.* 2022;**14**(2):118–23. [PubMed ID: 35619660]. [PubMed Central ID: PMC9123471].
 14. Oleastro M, Pelerito A, Nogueira P, Benoliel J, Santos A, Cabral J, et al. Prevalence and incidence of *Helicobacter pylori* Infection in a healthy pediatric population in the Lisbon area. *Helicobacter.* 2011;**16**(5):363–72. [PubMed ID: 21923682]. <https://doi.org/10.1111/j.1523-5378.2011.00858.x>.
 15. Misak Z, Hojsak I, Homan M. Review: *Helicobacter pylori* in pediatrics. *Helicobacter.* 2019;**24** Suppl 1. e12639. [PubMed ID: 31486243]. <https://doi.org/10.1111/hel.12639>.
 16. Jozefczuk J, Bancercz B, Walkowiak M, Glapa A, Nowak J, Piescikowska J, et al. Prevalence of *Helicobacter pylori* infection in pediatric celiac disease. *Eur Rev Med Pharmacol Sci.* 2015;**19**(11):2031–5. [PubMed ID: 26125266].
 17. Vanderpas J, Bontems P, Miendje Deyi VY, Cadranel S. Follow-up of *Helicobacter pylori* infection in children over two decades (1988–2007): persistence, relapse and acquisition rates. *Epidemiol Infect.* 2014;**142**(4):767–75. [PubMed ID: 23809783]. [PubMed Central ID: PMC9151151]. <https://doi.org/10.1017/S0950268813001428>.
 18. Cai H, Li W, Shu X, Peng K, Zhang Y, Jiang M. Genetic variation of *Helicobacter pylori* in the oral cavity and stomach detected using thymine adenine cloning in children with chronic gastritis. *Pediatr Infect Dis J.* 2014;**33**(1):e1–6. [PubMed ID: 23989107]. <https://doi.org/10.1097/INF.000000000000017>.
 19. Ibrahim A, Morais S, Ferro A, Lunet N, Peleteiro B. Sex-differences in the prevalence of *Helicobacter pylori* infection in pediatric and adult populations: Systematic review and meta-analysis of 244 studies. *Dig Liver Dis.* 2017;**49**(7):742–9. [PubMed ID: 28495503]. <https://doi.org/10.1016/j.dld.2017.03.019>.