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PREVALENCE AND RISK FACTORS OF HELICOBACTER PYLORI INFECTION IN UNIVERSITY STUDENTS.

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ABSTRACT

Background: Helicobacter pylori is a prevalent gastrointestinal pathogen that has been linked to gastritis, peptic ulcer disease, and gastric malignancies. University students are especially susceptible as they are prone to poor hygiene, stress, and unhealthy eating habits. It is important to detect prevalence and risk factors early to prevent them.

Objectives: To establish the prevalence of Helicobacter pylori infection in university students and the demographic, lifestyle, and environmental risk factors.

Methodology: This retrospective study conducted at department of Gastroenterology MTI LRH Peshawar from jan 2022 to jan 2023.comprised 100 university students aged 18-30 years with a simple random sampling method. Regarding demographics, hygiene, diet, and gastrointestinal symptoms, the structured questionnaire was selected as the method of data collection. The stool antigen test was used to identify infection. SPSS version 25 was used to carry out the statistical analysis with descriptive statistics and Chi-square tests with $p < 0.05$ as the significance level.

Results :The overall prevalence of H. pylori infection was 46%. Hostel residents had significantly higher infection rates (58%) compared to day scholars (34%). Key risk factors included poor hygiene ($p = 0.03$), street food consumption ($p = 0.02$), and hostel residence ($p = 0.01$). Common symptoms among infected students were epigastric pain (48%), nausea (35%), and bloating (30%). No significant association was observed with age or gender ($p > 0.05$).

Conclusion: H. pylori infection is extremely common among university students, and it has a close relationship with lifestyle and environmental factors that can be modified. Specialized measures such as hygiene, safe food, and early screening can be suggested to decrease the disease burden.

Keywords: Helicobacter pylori, prevalence, risk factors, students

Introduction

Helicobacter pylori (H. pylori) is a Gram-negative helicobacterium colonizing the gastric mucosa and is the causal agent of various gastrointestinal diseases, such as chronic gastritis, peptic ulcer disease, and gastric malignancies. It is estimated that more than 50 percent of the entire world is infected, with even greater prevalence existing in developing nations owing to the lack of adequate sanitation, overcrowding, and lack of access to health care services. H. pylori is mainly transmitted orally or fecally, usually by contaminated food, water, or by intimate inter-personal contact [1,2]. University students are a special group of the population as they are growing out of adolescence and maturing into adults, with many of them often residing in rooms (hostels or dormitories) without their families. Under this environment, they are at risk of contracting factors like sharing food utensils, irregular hygiene practices, and dietary habits, which can predispose them to get infected with H. pylori. Also, irregular meals, stress, and intake of street or fast food undermine the gastrointestinal vulnerability of this population [3,4]. Epidemiological research has shown a significant difference in the prevalence of H. pylori in students attending various universities in

different regions. As an example, African and Middle Eastern studies have prevalence rates of between 35 and 56 per cent, whereas the developed countries have relatively lower rates, usually between 20 and 40 per cent. This type of variation highlights the role of environmental, socioeconomic, and lifestyle elements in the acquisition and maintenance of infection [5,6]. H. pylori infection needs screening and early detection to avoid the long-term complications, such as peptic ulcers and gastric cancer. Regardless of the prevalence, there has been minimal research on university students who can act as a sentinel group regarding the intervention of public health. The prevalence and risk factors of this group should be understood in order to inform specific hygiene education, dieting, and early medical treatment [7,8]. To fill this gap in knowledge, this paper will determine the incidence of H. pylori infection among university students and the most important demographic, environmental, and lifestyle risk factors that can lead to infection. The results of this research can be used to shape the management of infection control, health promotion, and policy change in higher education institutions and eventually decrease the morbidity of H. pylori-related diseases among young adults [9,10].

Study Objectives

To establish the incidence of the Helicobacter pylori infection among university students and their respective demographic, environmental, and lifestyle risk factors that predispose them to infection, and to support preventive and health-promoting interventions.

Materials and Methods

Study Design & Setting

This retrospective study conducted at department of Gastroenterology MTI LRH Peshawar from jan 2022 to jan 2023.

Participants

A total of 100 students in the university (18-30 years) with simple random sampling were included in the study. Informed consent was given to students in written form, and structured questionnaires were filled out with demographic information, hygiene, dietary habits, and gastrointestinal symptoms. The exclusion criteria were the administration of antibiotics or proton pump inhibitors in the near past, which might have influenced the detection of H. pylori.

Sample Size Calculation

The formula used to compute sample size in a prevalence study was: n = Z 2 0: P1P0/d 2, 95% confidence level, expected prevalence = 50, and 10 percent margin of error. The required number of participants was at least 96; 100 students were recruited in terms of non-responses.

Ethical Approval Statement

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board (IRB)/Ethics Committee of the respective institution prior to the commencement of the study. Written informed consent was obtained from all participants (or their legal guardians, where applicable) before inclusion in the study. Confidentiality and anonymity of participant data were strictly maintained throughout the research process. Participants were assured of their right to withdraw from the study at any stage without any consequences.

Inclusion Criteria

Students aged between 18 and 30 years in universities, who were willing to take part in the study, and capable of giving stool samples.

Exclusion Criteria

Antibiotic, proton pump inhibitor, or previous H. pylori eradication therapy for 4 weeks.

Diagnostic and Management Strategy.
Stool antigen testing was used to diagnose H. pylori infection. Referrals and positive students were prescribed 14 days of the standard triple therapy consisting of a proton pump inhibitor, clarithromycin, and amoxicillin as per present clinical guidelines.

Statistical Analysis
The analysis of data was done through SPSS version 25. Continuous variables were given in the form of mean and standard deviation, and categorical variables in the form of frequency and percentages. The level of risk factors and infection was evaluated using Chi-square tests, whereby $p < 0.05$ was taken as a statistically significant result. Estimates of prevalence were performed with confidence intervals (95%).

Results
Out of 100 participants, 52% were male and 48% female. The overall prevalence of H. pylori infection was 46%. Infection rates were higher among hostel residents (58%) than day scholars (34%), indicating a significant association between communal living and infection ($p = 0.01$). Poor hand hygiene and frequent consumption of street food were reported in 40% and 62% of infected students, respectively, both showing significant associations with infection ($p = 0.03$ and 0.02).Gastrointestinal symptoms were more common among infected individuals, with epigastric pain (48%), nausea (35%), and bloating (30%) predominating. Smoking was reported by 20% of participants, showing a moderate, though non-significant, association with infection. Mean age of participants was 22.4 ± 2.6 years; infected students had a mean age of 23.1 ± 2.4 years, which was not statistically significant ($p = 0.08$). Overall, demographic factors such as gender and age were not significantly associated with H. pylori infection, while environmental and lifestyle factors demonstrated strong associations.

Intervention Outcome
Positive students were counseled and put on regular triple therapy. Follow-up showed a reduction in gastrointestinal symptoms and success of eradication in 90 percent of cases, and the effectiveness of follow-up and prompt therapy in university students.

Table 1. Demographic Characteristics of Participants (n = 100)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	52	52
Female	48	48
Age (years, mean ± SD)	22.4 ± 2.6	–
Residence		
Hostel	50	50
Day scholar	50	50

This table presents the demographic distribution of the study population, including gender, mean age, and type of residence.

Table 2. Lifestyle and Environmental Risk Factors of H. pylori Infection (n = 100)

Risk Factor	Infected (n=46)	Non-infected (n=54)	p-value
Hostel residence	29	21	0.01*
Poor hand hygiene	18	22	0.03*
Street food consumption	28	21	0.02*
Untreated water consumption	25	19	0.05

Smoking	10	10	0.28

This table shows the distribution of lifestyle and environmental risk factors among infected and non-infected students. $p < 0.05$ indicates statistical significance.

Table 3. Gastrointestinal Symptoms Among Participants (n = 100)

Symptom	Infected (n=46)	Non-infected (n=54)	Percentage in infected (%)
Epigastric pain	22	8	48
Nausea	16	9	35
Bloating	14	9	30
Vomiting	8	5	17
No symptoms	10	23	22

This table displays the prevalence of gastrointestinal symptoms among H. pylori infected and non-infected students.

Table 4. Association Between H. Pylori Infection and Participant Characteristics

Variable	Mean ± SD / n	Infected (%)	p-value
Age (years)	22.4 ± 2.6	23.1 ± 2.4	0.08
Gender	Male: 52	25 (54.3%)	0.45
	Female: 48	21 (45.7%)	
Residence	Hostel: 50	29 (58%)	0.01*
	Day scholar: 50	17 (34%)	

This table illustrates the relationship between H. pylori infection and key demographic factors. $p < 0.05$ indicates statistical significance.

Discussion

100 university students with a prevalence of H. pylori at 46%, with strong correlations of the environment and behavior being: hostel residence, poor hygiene, eating of street food, etc. The results are in line with an increasing body of literature that infections of H. pylori are still prevalent in youthful adults in university areas, thus implying continuing dissemination in the areas where there is frequent contact and common amenities [11,12].Our prevalence rate is a little higher than in a recent study that was done on medical students in Sudan, where 36% of the students were found to be positive with fecal antigen tests, and the clinical symptoms were considerably linked with infection [13]. This denotes that even though the pattern of risk is common in education settings, geographical and lifestyle variations can play a role in the general prevalence [14]. The regional variant is additionally supported by research conducted in East China that revealed that a mere 26.3 percent of those students who were screened were infected with H. pylori despite the fact that the awareness levels were low and the screening habits were poor. This implies that prevalence levels in students may be vastly different depending on community exposures, sanitation, and diet [15].Similar relations between H. pylori infection and environmental risk factors have been proven in many previous studies. As an illustration, systematic reviews have continually demonstrated that overcrowding, poorer socioeconomic status, and poor water access are influential determinants of infection, which supports the social determinants of health that contribute to the H. pylori prevalence on the global platform [16]. The relevance of these factors to student populations is supported by our own results on the increased incidence of infections among hostel occupants, where the risk of transmission can be increased by the combination of living in a high population density [17].Similar patterns are also found in comparisons with the

data on younger age cohorts: children and adolescents have a high prevalence of H. pylori across the world, but adults will have lower prevalence rates in some locations as a result of better sanitation and medical care access, as seen in previous epidemiological studies [18]. This indicates a change in generations, but young adults in the transitional setting (university) might still indicate high exposure risk.The patterns of risk factors in our study, particularly the poor hygiene and the consumption of street foods, reflect the results of numerous environments where the lifestyle patterns are the key determinants of infection rates [19]. Other student-specific research has also pointed to the fact that students with irregular eating patterns, high levels of unsafe or street food consumption, and poor personal hygiene have an increased likelihood of harboring H. pylori, although the size of such associations has not been consistent. These behavioral variables are still some of the most important targets of health education programs [20]. Our infected sample (e.g., epigastric pain, nausea, and bloating) is consistent with clinical manifestations of previous studies of students and the general population, and supports the clinical significance of H. pylori even in asymptomatic individuals. Abdominal pain and nausea were also included in the domestic symptoms of infection among the Sudanese cohort, but the relationship with lifestyle variables was less significant, perhaps because of the differences in the size of the samples [21].It is important to note that lower prevalence was observed in some studies that have been done on health sciences students, and that this might be due to varied diagnostic methods, sample sizes, and the sociocultural contexts used. This difference highlights the need to maintain consistency in methodology and adequate sample size in estimating prevalence in particular populations [22].

Limitations

This Study was also small in terms of sample size (only 1 center) and could have some implications for generalization. Self-report questionnaires can lead to the bias of recollection. Moreover, stool antigen testing, although not invasive, might have low sensitivity against urea breath tests or endoscopic biopsy-based techniques and, therefore, may underestimate true prevalence.

Conclusion

The H. pylori infection is still common among university students and is highly linked to the risk factors that are modifiable, such as hygiene practices, residence in hostels, and dietary practices. Health education, safe food precautions, and early screening are necessary preventive measures targeted to lower the chances of infection and enhance the gastrointestinal condition among this population.

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Authors Contributions

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Final Approval of version: **All Mentioned Authors Approved the Final Version.**

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