

PREVALENCE AND RISK FACTORS OF *HELICOBACTER PYLORI* INFECTION AMONG THE PEOPLE OF DISTRICT BAJAUR, KPK, PAKISTAN

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Abstract- Bacterium *Helicobacter pylori* cause gastric ulcer, gastritis, gastric adenocarcinoma, and found on gastric epithelium. A descriptive cross-section study was conducted from May 2023 to July 2023 at the different laboratories of the District headquarters hospital in Khar, Bajaur KP, Pakistan. The study objective was to find the *H. pylori*'s infection prevalence among the local people of District Bajaur, Pakistan. About 412 samples were collected from seven Tehsils of District Bajaur. The total samples were grouped into five age groups, in which the positivity was (36.46%) in the age group 21-30. About 282 suspected patients were male out of which 68% were positive. About 74 of total 130 female patients were positive for infection. About 64.56% (266/412) patients were positive and 35.44% (146/412) were negative. The majority of the *H. pylori*-infected patients were with low socioeconomic status 176/266. Most of the infected patients were with indigestion problems and the most affected age group was 21-30.

Keywords: Age; Bajaur; Gastric ulcer; Gender; *Helicobacter pylori*; Prevalence; risk factors

INTRODUCTION

H*elicobacter pylori* is a helical shaped micro-aerophilic gram-negative bacterium that infect stomach lining [1]. It causes peptic ulcers, gastric adenocarcinoma, chronic gastritis and gastric mucosa-associated lymphoid tissue (MALT) lymphoma [2]. Size of *H. pylori* is 0.5–1 µm width and 2–4 µm in length [3]. Flagella are used for adhesion and motility [4]. About 1 million cases of stomach cancer and over 800,000 deaths were reported in 2020 from *H. pylori* related problems [5]. This disease is

cosmopolitan and infects about half of the world population [6]. Bacterium can survive in acidic environment of the stomach [7]. Majority of patients had no sign and symptoms. *H. pylori* prevalence in Pakistan is about 50-90% in Pakistan. The exact transmission's mechanism of *H. pylori* is unknown but it usually passed from person to person through direct contact with vomit, saliva, or stool or from environment. *H. pylori* infection is linked with various factors such as poverty, socioeconomic status and social deprivation [8]. It can cause various diseases such as gastric cancer, peptic ulcer and mucosa-associated lymphoid tissue lymphoma. *H. pylori* infection can be diagnosed from various clinical symptoms, PCR, histology based tests, Rapid urease test, and culture [9]. Other tests used for the diagnosis of *H. pylori* infection included serological tests, urea breathe test and stool antigen test [10, 11].

Different options are available for the treatment of *H. pylori* infection. Triple therapy consisting of amoxicillin, clarithromycin and proton pump inhibitors are used twice daily for seven to fourteen days. Amoxicillin may be replaced with Metronidazole in case of allergy to penicillin [12]. Quadruple therapy is administered for *H. pylori* infections in areas of high frequency. The therapy for 10-14 days with tetracycline, metronidazole, bismuth salts and proton pump inhibitors is recommended [3].

METHODS AND MATERIALS

Study Area

The study was carried out at District Bajaur, located at 1126m altitude and land masses lay between 34.7865

north latitudes and 71.254777 east longitude. The area of District Bajaur is 1290 Km with a total population of 1,287,960 resident individuals; the language is Pashto with seven tehsils and 120 village councils. Kunar Valley is situated to the West and North of Bajaur, District Mohmand lies to the south and Malakand and Panjkora River lies to the East. District Bajaur has seven tehsils which include Tehsil Barchamar Kand, Khar, Loe Mamund, Wara Mamund, Nawagai, Salarzai and Utman Khel.

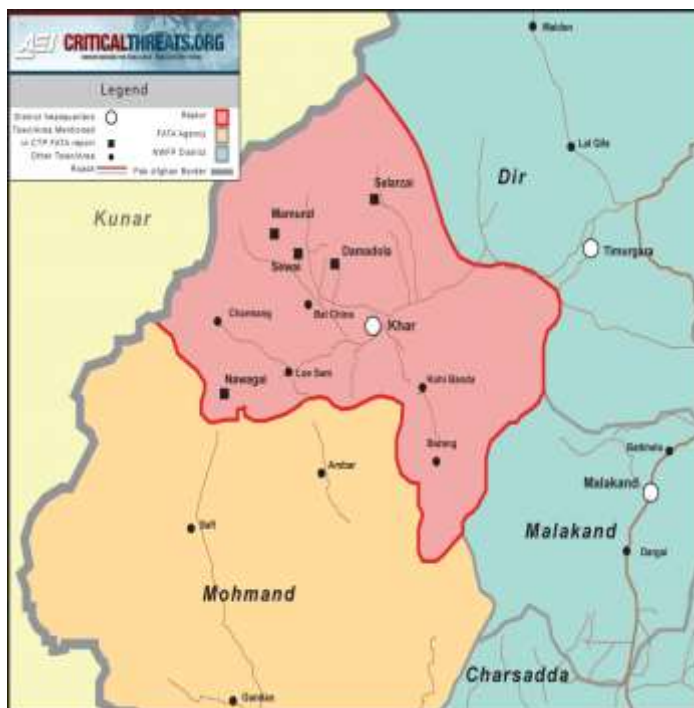


Figure -1: Map of the study area; District Bajaur

Study population and design

This cross sectional and descriptive study was carried out at District Headquarter Hospital Khar Bajaur, Khyber Pakhtunkhwa, Pakistan. The above mentioned study design was chosen for the investigation of prevalence and risk factors associated with *H.pylori* infection. The number of suspected patients included in the study was 412 of different age groups from seven tehsils of Bajaur District.

Collection of Sample and Methodology

The current study was carried out at DHQ hospital Khar, Bajaur from March, 2023 to August, 2023. Samples were collected from suspected patients at DHQ Hospital Khar Bajaur and other private laboratories of District Bajaur. Stool and blood samples were tested through Immune chromatographic technique (ICT); one step rapid *H.Pylori* Antigen test. Samples were applied on ICT strips and allowed to migrate by capillary action via the membrane and to react with the reagents in the membrane. The appearance of colored band signposted the positive result, while its absence revealed the negative result. Questionnaires were handed over to all the study participants and were asked to provide information about their gender, age, symptoms, education, address and socio-economic status.

Ethics statement and data analysis

Current study was approved by the ethics committee of DHQ Hospital Khar, Bajaur, Pakistan. Data and information were collected from the study participants after the legal approval of hospital administration. Specimens were collected carefully and collected data were analyzed by using Microsoft excel.

RESULTS

The current study was conducted in District Bajaur total of 412 samples were collected from the seven Tehsils of District Bajaur and mainly from DHQ Hospital Khar Bajaur. Out of 412 patients, 266 (64.56%) were reported positive for *H. pylori* infection. About 192 (72%) infected patients were males and 74 (28%) were female. The total study patients were grouped into five age groups in which the highest positive prevalence 36.46 % was recorded in

the age group 21-30. The *H. pylori* prevalence was high in patients 88 (33.08%) infected with indigestion problems as compared to patients infected with other symptoms. Majority of the *H. pylori*-infected patients were with low socioeconomic status 176/266.

Gender-wise distribution

Patients were belonged to two groups based on their gender. A total of 282 suspected patients were male among which 68% were positive and 32% were negative. About 130 suspected patients were female among which 57% were positive and 43% were negative.

Table.1. Gender-wise distribution of *H. pylori*'s infection

Gender	Total Number	Positive prevalence	Negative prevalence	%age positive	%age negative
Male	282	192	90	68%	32%
Female	130	74	56	57%	43%

Age-wise prevalence of *H. pylori*'s infection

Total of 412 suspected patients were investigated and grouped into different age groups. Positivity in age group 10-20 was 72.32%, while 27.68% were negative. In the second age group from 21-30 years, their positivity was 66.44%. The table shows the result in details.

Table -1: Age-wise distribution of *H. pylori*'s infection among the local population of District Bajaur

Age Group	Positive prevalence	Negative prevalence	%Age Positive	%Age negative
10-20	81	31	72.32%	27.68%
21-30	97	49	66.44%	33.56%
31-40	44	22	67%	33%
41-50	27	24	53%	47%
51-60	17	20	46%	54%

Tehsil-wise distribution of *H. pylori* infection

The highest positive prevalence in suspected patients was reported from Tehsil Khar (98/144), which is 68.05%. The lowest positive prevalence was from tehsil Barang 57.69%. All the other Tehsils were positive with the middle range of tehsil Khar and tehsil Barang.

Table -2: Tehsil-wise distribution of *H. pylori* infection among the people of District Bajaur

Tehsils	patients	%age positive	%age negative
Utman Khel	62	58.06%	41.94%
Mamund	50	64%	36%
Khar	144	68.05%	31.94%
Nawagai	76	60.53%	39.47%
Barang	26	57.69%	42.31%
Salarzai	54	66.67%	33.33%

Symptoms based distribution of *H. pylori*

The patients infected with problem of indigestion showed the highest prevalence as compared to the patients with other symptoms. Patients with different symptoms like indigestion (88), acidity (38), headache (36), low appetite (44), body pain (22) and abdominal pain were (38). The frequency of *H. pylori* infection in relation to different symptoms among the patients is shown in figure 2.

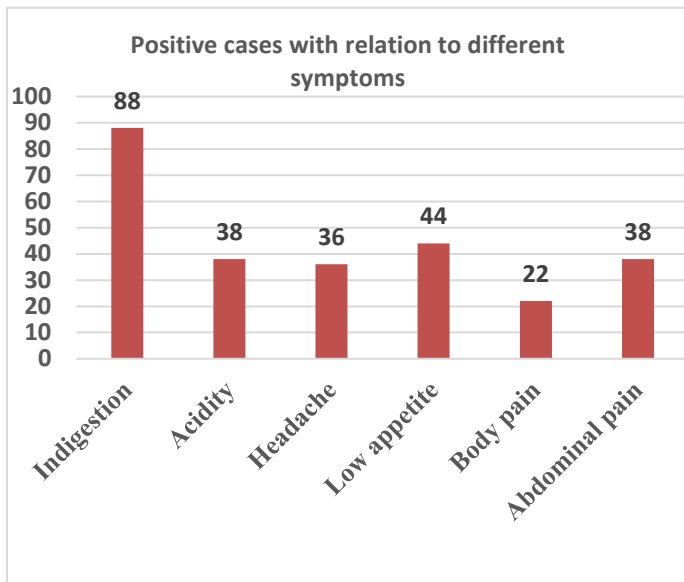


Figure -2: Positive prevalence of H.Pylori based on different symptoms

Socio-economic status of patients

The risk of infection is increased in patients with low socioeconomic status, because low socioeconomic status is associated with poor hygiene and unfavorable sanitary conditions, which are considered important risk factors for *H. pylori* infection. The number of patients with low socio-economic status was 176 and the number of patients with low socio-economic status was 90, however no patient with high socio-economic status was recorded.

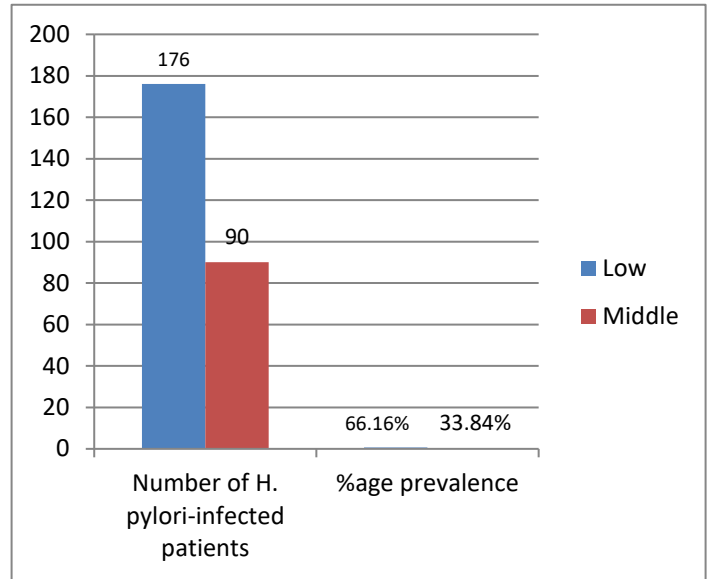


Figure -3:H.pylori patients based on socio-economic status

Prevalence of H. pylori infection in relation to literacy rate

Number of literate patients was high 150/266 (56.39%), while the number of illiterate patients was 116/266 (43.61%).

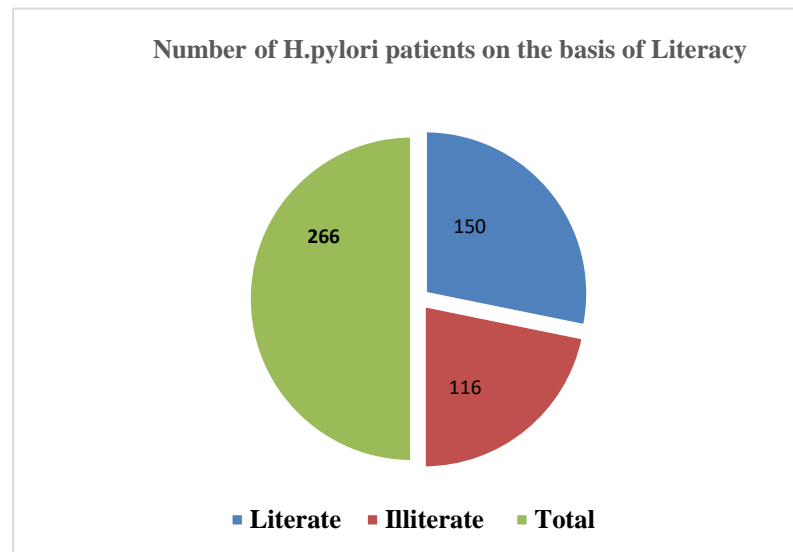


Figure -4: H. pylori infection prevalence in relation to literacy

DISCUSSION

Infection of *Helicobacter pylori* is common in human around the globe and almost half of the global population is infected, moreover, infection frequency associated socio-economic factors and hygienic level [6,13]. *Helicobacter pylori* cause peptic ulcer, chronic gastritis, gastric adenocarcinoma and mucosa associated lymphoid tissue lymphoma (MALT) [2]. About 4.4 billion cases of *Helicobacter pylori* infections were reported in 2015 according to the global systemic review data. Current study carried out at DHQ hospital Khar, Bajaur, Pakistan showed that 266 study participants were positive among the total 412 patients, positivity rate was (64.56%) in the local population of District Bajaur, Pakistan. Muhammad *et al* reported 66.66% prevalence of *H. pylori* from District Bunir in 2020. There was a decrease in trend of prevalence from young age to elderly age. Rishma *et al* also reported high prevalence in young age people and decrease in elder population in Mardan, Pakistan [8]. In Malaysia high prevalence of *H. pylori* infection were recorded in illiterate population (67%) by Huang *et al*, on contrary 72.3% prevalence were reported by Rishma *et al* from Mardan [8, 13]. Current study reported higher prevalence in male (72.18%), while lower prevalence in female (27.18%). Muhammad *et al* also reported 45.94% prevalence in male and 54.05% in female [14].

There was a strong relationship reported for many years between socio-economic status and *H. pylori* infection. Risk factor that increase chances of *H. pylori* infection concluded from the current study included poverty, poor living and hygienic conditions and lower socio-economic status [8]. Researcher from Brazil reported that there is a link between *H. pylori* infection increase and number of person living together in a single family. Overcrowded houses without flushed washrooms shows poor hygienic

conditions and increase the chances of infection. Frequency of *H. pylori* infection had increased significantly among male, younger and literate population of the study area from the last few decades [9].

CONCLUSION

H. pylori can enter to digestive tract by mouth and get access to the stomach mucosal lining where it led to peptic ulcer, chronic gastritis, gastric adenocarcinoma and MALT. *H. pylori* is cosmopolitan around the globe. It is concluded from the recent study that *H. pylori* is prevalent among the local population of District Bajaur, Khyber Pakhtunkhwa, Pakistan. The study further revealed that among the total 412 suspected patients 266 (64.56%) were confirmed as positive and 146 (35.44%) were found negative for *H. pylori*'s infection. The prevalence of the mentioned disease was higher in male (72.18%) as compared to female (27.81%). Infection rate was high in patients of socio-economic status and literate. The rate of infection was higher in younger age group. Lower Socio-economic status poor hygienic condition is the main cause of *Helicobacter pylori* infection.

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