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Prevalence of *Helicobacter pylori* infection among adults in Elfashir, North Darfur, Western Sudan

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Abstract

Objective: To estimate the prevalence of *Helicobacter pylori* antigen (*H. pylori*) in stool among adult patients with dyspepsia and to find out the correlation between *H. pylori* infection and hemoglobin concentrations as well as demographic data.
Methods: This cross-sectional laboratory-based study, which ran between December 2018 and June 2019 among patients attending the outpatient medical clinic in Elfashir city. *H. pylori* antigen was determined in stool by using ICT for *H.pylori* Ag.
Results: A total of 227 adult Sudanese patients were enrolled in the study. Of these, 104 (45.8%) tested positive for *H. pylori* Ag. There were no significant correlation between infection with *H. pylori* and low level of hemoglobin, gender, and age, (P≤0.005).
Conclusions: High prevalence of *H. pylori* infection among adult patients with dyspepsia in Elfashir city has been documented. Correlation between infection with *H.pylori* and demographic as well as low hemoglobin level need more studies with large sample size.
Keywords: *H. pylori*, Stool antigen test., Dyspepsia, Sudan.

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1. Introduction

Helicobacter pylori is a Gram-negative bacteria that colonizes the gastric mucosal layer and is probably the most common infectious disease worldwide [1,2]. It has been associated with peptic ulcer disease, gastric carcinoma, and mucosal-associated lymphoid tissue lymphoma [3-5]. In most cases, *H. pylori* infection is asymptomatic. Of those tested for *H. pylori*, 17% will develop peptic ulcers [6]. The infection occurs during early childhood, and if left untreated, it may persist for a lifetime [7].

There are many differences in the prevalence of *H. pylori* among different societies and geographical locations [8]. It has infected more than half of the people in the world [9,10]. The prevalence of *H. pylori* is higher in developing countries than in developed countries [11]. The prevalence of *H. pylori* is related to socioeconomic conditions, socio-demographic profiles, hygiene, and life style characteristics of people [12]. Among the socio- demographic characteristics age, gender, occupation, and alcohol consumption are associated with the prevalence of *H. pylori.* Several studies have demonstrated that there is a high *H. pylori* infection rate in Middle Eastern countries [1, 13].

2. Materials and Methods

2.1 Study Design

This cross-sectional hospital-based study carried out between December 2018 and June 2019 among patients attending the outpatient clinic.

2.2Study Area:

The study was conducted in the Elfashir City which is capital of the North Darfur State (lies between longitudes 31.5-34 east and latitude 15-16 north), with an area of about 28.165 square kilometers.

2.3StudyPopulation:

All patients presented to the outpatients with dyspeptic symptoms during the study period were asked to answer a structured questionnaire consisting of socio-demographic data (age, gender, residence and education) and dyspeptic symptoms.

2.4 Sample Size and Data Collection

Stool was collected from 227 dyspeptic patients in wildly mouth containers and data was collected by a structural interview questionnaire like age and gender of all subjects. The objectives of the study were verified to all patients and their consent was obtained. The antigen was detected in the stool by using ICT for *H. Pylori* Ag manufactured by **HELGEN**.

2.5 Ethical Approve

The ethical approve was taken from ministry of health. Consent was taking from all participants or their guardians before being enrolled in the study. All participants were informed for this study.

2.6 Data Analysis

Statistical Package for Social Sciences program (SPSS Inc., Chicago, IL, USA) version 20 was used for data entry and for analysis of the patients demographic characteristics; Laboratory findings of *H. pylori* infection and demographic data were analyzed by simple descriptive statistics. Chi-square test was used to compare every two variables. A p value less than 0.05 was statistically significant.

3. Results

A total of 227 adult (71 males and 156 females) from different areas in Elfashir were enrolled in the study. The ages of the participant ranged from 15 to 70 years (mean 38.4 years). *H. pylori* positive was found to be 45.8% (104/227).

The majority of the infected adult between ages of 21-30 years 25.6% (58/227). (Table 1) The hemoglobin below normal range was detected in 14.1 % of males (32/227) and 31.7 % of females (72/227). (Table 2)

There were no statistically significant correlation between *H. pylori* infection and age, gender and low hemoglobin level respectively (p = 0.346), (p = 0.061), (p = 0.267)

Table 1: Distribution of age:

Age group /year	frequency	Percent %
10 - 20	49	21.6
21 - 30	58	25.6
31 - 40	32	14.1
41 - 50	32	14.1
51 - 60	16	7.0
61 - 70	22	9.7
More than 70	18	7.9
Total	227	100

Table 2: Distribution of Hemoglobin level

Hb group g/dl	frequency	Percent %
Anemic Male<13.3	32	14.1
Normal Male > 13.3	39	17.2
Anemic Female< 12	72	31.7
Normal Female>12	84	37.0
Total	227	100.0

4. Discussion

The prevalence of *H. pylori* infection in the present study was 45.8% which is lower than study documented by Azim *et al* [14]. And recent study conducted in central Sudan where prevalence was 48% has been reported by Abdalsadeg *et al* [15]. This comparison should be considered cautiously since our study is antigen-based detection in stool while other study is endoscopy-based. The lower prevalence of infection in the present study may be explained by small sample size and improvement in standards of living. The prevalence of H. pylori infection in our study was lower when compared with other studies implemented in other countries such as Libya (94%), Ethiopia (89%) and Uganda (87%) documented by Bakka *et al* [16] and Newton *et al* [17], which might be answered by the socio-demographic differentiation as well as characteristics studied populations.

Highest prevalence infection was documented in age group between (21 and 30) years old without significant correlation (p = 0.346). This result was disagreed with study reported by Hamid and Eldaif [18] in Sudan which reveled high prevalence infection among age group (30-50) years old. This result nearly study implemented by Mohanna *et al* [19].

Moreover, the study revealed there was no statistically significant correlation between *H. pylori* infection and gender in our study (p = 0.061). This information has been documented by many other researchers [20,21], however, a similar finding was documented by Valliani *et al*. who showed that H. pylori infection occurred more commonly in male than that of in female patients [2].

Study documented there was no statistically significant association between low hemoglobin level and prevalence of *H.pylori* infection (p = 0.267), by the other hand the level of hemoglobin was lower in the *H. pylori* (+) group than in the *H. pylori* (−) group which indicates that *H. pylori* infection may be related to anemia and low hemoglobin level. Explanation for these contradictory findings might be due to the difference in studied population and samples size [22].

5. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding this study.

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References

[1]. Khedmat H, Karbasi-Afshar R, Hossein Khedmat, Agah S, Taheri S. *Helicobacter pylori* infection in the general population: A middle eastern perspective. *Caspian J Intern Med*, 2013; 4: 745–53.

[2]. Valliani A, Khan F, Chagani B, *et al*. Factors associated with *Helicobacter pylori* infection, results from a developing country - Pakistan. *Asian Pac J Cancer Prev*, 2013; 14: 53 6.

[3]. Goto Y, Ari Syam F, Darnindro N, *et al*. Prevalence and risk factors for *Helicobacter Pylori* infection among healthy inhabitants in Northern Jakarta, Indonesia. *Asian Pac J Cancer Prev*, 2013; 17: 4747–53.

[4]. Jafar S, Jalil A, Soheila N, *et al*. Prevalence of *Helicobacter pylori* infection in children, a population-based cross-sectional study in West Iran. *Iran J Pediatr*, 2013; 23; 13–8.

[5]. Ashtari S, Pourhoseingholi MA, Molaei M, *et al*. The prevalence of *Helicobacter pylori* is decreasing in Iranian patients. *Gastroenterol Hepatol Bed Bench*, 2015; 8: 23–9.

[6]. Abdallah TM, Mohammed HB, Mohammed MH, *et al* (2014). Sero-prevalence and factors associated with *Helicobacter pylori* infection in Eastern Sudan. *Asian Pac J Trop Dis*, 2014; 4: 115–19.

[7]. Niknam R, Seddigh M, Fattahi MR, *et al*. Prevalence of *Helicobacter pylori* in patients with dyspepsia. *Jundishapur J Microbiol*, 2014; 7, doi:10.5812/jjm.12676.

[8]. Abebaw W, Kibret M, Abera B. Prevalence and risk factors of *H. pylori* from dyspeptic patients in Northwest Ethiopia: A hospital based cross-sectional study. *Asian Pac J Cancer Prev*, 2014; 15: 4459–63.

[9]. Correa P, Piazuelo MB. *Helicobacter pylori* infection and gastric adenocarcinoma. *US Gastroenterol Hepatol Rev*, 2011; 7: 59–64.

[10]. Diaconu S, Predescu A, Moldoveanu A, Pop CS, Fierbințeanu- Braticevici C. *Helicobacter pylori* infection: old and new. *J Med Life*, 2017; 10: 112-17.

[11]. Torres J, Perez-Perez G, Goodman KJ, *et al*. A comprehensive review of the natural history of *Helicobacter pylori* infection in children. *Arch Med Res*, 2000; 31: 431–69.

[12]. Salih B A. *Helicobacter pylori* infection in developing countries: the burden for how long?. *Saudi J Gastroenterol*, 2009; 15: 201–7.

[13]. Malekzadeh R, Derakhshan MH, Malekzadeh Z. Gastric cancer in Iran: epidemiology and risk factors. *Arch Iran Med*, 2009; 12: 576–83.

[14]. Azim Mirghani YA, Ahmed S, Ahmed M, Ismail MO, Fedail SS, Kamel M, *et al*. Detection of *Helicobacter pylori* in endoscopic biopsies in Sudan. *Trop Doct* 1994; 24(4): 161-163.

[15]. Abdalsadeg NA, Adam AA, Abdul-Aziz H, Omer WH, Osman HA, Bolad AK. Comparison of different diagnostic methods of *Helicobacter pylori* infection in Sudanese patients. *Al Neelain Med J* 2012; 2(4): 27-34.

[16]. Bakka AS, El-Gariani AB, Abou Ghrara FM, Salih BA. Frequency of *Helicobacter pylori* infection in dyspeptic patients in Libya. *Saudi Med J* 2002; 23(10): 1261-1265.

[17]. Newton R, Ziegle JL, Carpenter L, Gold BD, Owens M, Beral V, *et al*. *Helicobacter pylori* and cancer among adults in Uganda. *Infect Agent Cancer* 2006; 1: 5.

[18]. Hamid, O.S. and Eldaif, W.A. Association of *Helicobacter pylori* infection with life style chronic diseases and body-index. *Journal of Science*, 2014; 4(4): 255-258.

[19]. Mohanna, M.A.B., Al-Zubairi, L.M. and Sallam, A.K. Prevalence of *Helicobacter pylori* and parasites in symptomatic children examined for *Helicobacter pylori* antibodies, antigens, and parasites in Yemen. *Saudi Medical Journal*, 2014; 35(11): 1408

[20]. Alvarado-Esquivel C. Seroepidemiology of *Helicobacter pylori* infection in Tepehuanos aged 15 years and older in Durango, Mexico. *J Pathog* 2013; 2013: 243246. Doi: 10.1155/2013/243246.

[21]. Bureš J, Kopáčová M, Koupil I, Seifert B, Skodová Fendrichová M, Spirková J, *et al*. Significant decrease in prevalence of *Helicobacter pylori* in the Czech Republic. *World Gastroenterol* 2012; 18(32): 4412-4418.

[22]. Mei-Yan Xu, Bing Cao, Bao-Shi Yuan, Jian Yin, Lan Liu & Qing-Bin Lu Association of anaemia with *Helicobacter pylori* infection: a retrospective study 2017; 2: 47: 13434 DOI:10.1038/s41598-017-13955-3