# Prevalence of *Helicobacter pylori* Infections in Cigarette and Nargileh Smoking Males

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***Abstract*—Smoking is the foremost public health problem affecting the world and it has a crucial implication in causing many common diseases due to *Helicobacter pylori* infection which is globally distributed, smoking is considered as a critical risk factor that accelerates the infection with this bacterium, the study's goal was to find out how common *Helicobacter pylori* infections were among male cigarette and nargileh smokers. Blood samples were collected and used for detection of anti- *Helicobacter pylori* IgG Ab from 80 males who were smokers and 20 from non-smoker males.**

**The prevalence of *H. pylori* positivity was 34% (24 (70.6%) in smokers and 10 (29.4%) in nonsmokers, The highest percentage (52.9%) was found in the young age group (25-34) years, and 88.2 % of *H. pylori* positive individuals exhibited stomach symptoms. Fifty percent (50%) of *H. pylori*-infected individuals were Nargileh smokers. Smoking was a key factor in the seroprevalence of *Helicobacter pylori* and played a substantial impact on it.**

***Index Terms*— *Helicobacter pylori*, IgG, Cigarette, Nargileh, Smoker.**

## I. INTRODUCTION

Smoking is of the foremost public health problems affecting the world and it has a crucial implication in causing many common diseases such as periodontitis, chronic obstructive pulmonary diseases, and cancer, in addition, its effects on the microbiome allowing oral pathogens to grow that leads to several diseases (1). *Helicobacter pylori* is a bacterium that is in the stomach and can alter the environment around them to live. In addition, mucus protects microorganisms, and immune cells in the body can't access them and are not destroyed which leads to stomach problems, the majority of the stomach and small intestine ulcers are caused by this bacterium. Drinking contaminated water and eating unclean or poorly prepared food, sharing the residence with those infected with *H. pylori*, and living in overcrowded quarters are all risk factors for bacterial infection. The illnesses are believed to travel from one person's mouth to another, as well as from feces to the mouth., also *H. pylori* has been detected in gastric refluxate, vomitus saliva (1).

Smoking is a well-known risk factor for stomach ulcers, and both *H. pylori* infection and smoking are classified as definite carcinogens (2).

The World Health Organization has categorized *H. pylori* as a Class 1 carcinogen. *H. pylori* is carried by 70%–90% of the population in developing nations during childhood, but the prevalence is 30%–40% in developed countries. Infections with *H. pylori* are more common among smokers than in nonsmokers (3).

The prevalence of *H. pylori* infection is inversely related to socioeconomic status, particularly about living conditions during childhood. This is because the prevalence of *H. pylori* infection is low during childhood and gradually rises with age, with the increase resulting only to a small extent from *H. pylori* acquisition later in life (4). *Helicobacter pylori* is a disease that influences the relative risk of acquiring numerous upper gastrointestinal clinical problems, and testing for it should be done to discover the origin of an underlying ailment such as peptic ulcer disease or in people with familial stomach cancer (4). The goal of this study was to find out how often *H. pylori* infections are in Cigarette and Nargileh smokers.

## II. MATERIALS AND METHODS

The study was performed from August to December 2021 in Erbil city Kurdistan Region, Iraq. Blood samples were collected from 80 males who were a smoker and 20 from non-smoker males and prepared for antigen tests (Anti *H. pylori* IgG Ab in the blood (AMP Company). Epidemiological data were captured on questionnaires including socio-demographic data (age, educational level, family history, alcohol drinking, gastritis symptoms), and health determining behaviors (cigarette and nargileh smoking).

Statistical analysis: SPSS (Statistical Package for Social Science) version (25) was used. The $\chi^2$ test was used to analyze the data. $P < 0.05$ was considered statistically significant.

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## III. RESULTS

Patients with non-ulcer dyspepsia were included in our research after being recommended by their physician for the *H. pylori* test. We looked at the data of 100 non-ulcer dyspepsia male patients. Eighty (80) patients (80%) were smokers, whereas twenty (20%) were nonsmokers (figure 1).

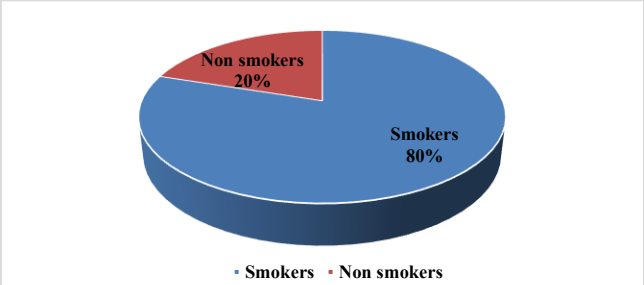


*Fig.1. the percentage of 100 patients of smoker and non-smoker*

In our study, we discovered that *H. pylori* positive was 34% (24 (70.6%) in smokers and 10 (29.4%) in non-smokers, with 66% being negative. There was also a statistically significant difference in *H. pylori* positivity rates between smokers and non-smokers (*p-value*=0.007). (Table1)

*Table 1 The prevalence of H. pylori seropositivity in smoker and non-smoker patients*

| *H. pylori* infection | Smoker | Nonsmoker | Total |
|---|---|---|---|
| Positive | 24 (70.6 %) | 10 (29.4%) | 34 (34%) |
| Negative | 56 (84.8%) | 10 (15.2%) | 66 (66%) |
| Total | 80 (80%) | 20 (20%) | 100 (100%) |

*Table 2 Distribution of H. pylori infection in relation to age*

| Age group | No. of individuals with *H. pylori* positive |
|---|---|
| 15-24 | 10 (29.4%) |
| 25-34 | 18 (52.9%) |
| 35-44 | 4 (11.8%) |
| 45-54 | 2 (5.9%) |
| Total | 34 (100%) |
| *P-value* | (0.02) significant |

*Table 3 The percentage of H. pylori seropositivity according to the* level of education

| *H. pylori* seropositivity | Illiterate | Primary | Secondary | High education | Total |
|---|---|---|---|---|---|
| Positive | 2 (5.9%) | 5 (14.7%) | 5(14.7%) | 22(64.7% | 34 |
| Negative | 3 (4.5%) | 7(10.6%) | 12(18.2%) | 44 (66.7% | 66 |
| Total | 5 (5%) | 12 (12%) | 17(17%) | 66 (66% | 100 |
| *P-value* | 0.09 not significant | | | | |

*Table 4 The percentage of H. pylori infection according to the level of socioeconomic status*

| *H. pylori* seropositivity | Low | Medium | High | Total |
|---|---|---|---|---|
| Positive | 3(8.8%) | 31 (91.2%) | 0 (0.0%) | 34 |
| Negative | 4 (6.1%) | 59 (89.4%) | 3(4.5%) | 66 |
| Total | 7 (7%) | 90 (90%) | 3(3%) | 100 |
| *P-value* | 0.4 not significant | | | |

*Table 5 The percentage of gastric symptoms in H. pylori seropositivity*

| *H. pylori* seropositivity | With symptoms | Without symptoms | Total |
|---|---|---|---|
| Positive | 30(88.2%) | 4 (11.8%) | 34 |
| Negative | 43 (65.2%) | 23 (34.8%) | 66 |
| Total | 73(73%) | 27 (27%) | 100 |
| *P- value* | 0.01 significant | | |

*Table 6 The percentage of H. pylori seropositivity concerning to family history of infection*

| *H. pylori* seropositivity | Yes | No | Total |
|---|---|---|---|
| Positive | 24(70.6 %) | 10 (29.4 %) | 34 |
| Negative | 32 (48.5 %) | 34 (51.5 %) | 66 |
| Total | 56(57%) | 44 (44%) | 100 |
| *P- value* | 0.03 significant | | |

*Table 7 The percentage of H. pylori seropositivity concerning the type of smoking*

| *H. pylori* seropositivity | Cigarette | Nargileh | Both | Total |
|---|---|---|---|---|
| Positive | 5(20.8%) | 12 (50%) | 7(29.2%) | 24 |
| Negative | 9(16.1%) | 26 (46.4%) | 21(37.5%) | 56 |
| Total | 14 (17.5%) | 38 (47.5%) | 28(35%) | 80 |
| *P- value* | 0.6 not significant | | | |

## IV. DISCUSSION

A total of 100 males were included in the study and serum samples were tested for the presence of *Helicobacter pylori* IgG, 80 % were smokers and 20% were nonsmokers (Figure 1). Among our research, the prevalence of *H. pylori* positive was found to be 34 % (24 (70.6 %) in smokers and 10 (29.4 %) in nonsmokers, with a statistically significant difference between the two groups (P= 0.007) (Table 1). This result agrees with other studies who found that 63.64% and 71.4% of subjects that had a history of cigarette smoking were found to have *H. pylori* and according to their statistical analysis, discovered a relationship between cigarette smoking and an increased frequency of *H. pylori* infection ($P < 0.0001$) (2,3), as a result, smoking has a major role in the development of peptic ulcer disease and dyspeptic symptoms. Age distribution of *H. pylori* infection in this study showed an increasing trend in the young age (25-34 years (52.9%) and decreased in older age the difference was significant ($P= 0.02$) (Table 2), our result similar to the observations laid by Priyadarshini *et al.*,(2018) who discovered that the frequency of *H. pylori* infection was higher among 20-40 year old's than in older people, and They discovered that infections were more common in young and

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middle age groups (25–50 years) than in other age groups, that approved by WHO (5), in addition, similar finding with results of a study done by Lim *et al*., (2018) who said that seropositivity *to H. pylori* increased with age, then declined somewhat as people got older. ($P < 0.001$) (6). The relationship between the level of education and *H. pylori* infection was not significant (*P value*= 0.09), as indicated in table (3), the result agrees with results of other studies that low levels of education, especially Inadequate health education and a proclivity to live in an environment that encourages fecal contamination of food and water have both been linked to an increased risk of chronic *H. pylori* infection (3,5). Statistical significance differences were only identified in respondents with low and medium educational levels according to some studies (6). It's very interesting to look at the additive discriminative power of multiple risk factors and as seen in the table **(**4) Individuals from poor and middle socioeconomic backgrounds exhibited high *H. pylori* prevalence rates, although the differences were not significant (P-value = 0.09). Poor socioeconomic level, lack of education, and genetic factors all contribute to greater *H. pylori* colonization rates (5). Study participants with lower (low and medium) family income levels showed a higher percentage of *H. pylori* seropositivity than those with higher income levels, and he concluded that statistical significance was only seen in persons with medium income levels (6). When compared to those in higher socioeconomic classes, 87.83% of those in the lower socioeconomic class and 76.4 % of those in the medium socioeconomic class have a higher *H. pylori* infection rate [3]. Based on all of these findings we indicated that lower and medium social class raises the risk of infection with *H. pylori* and it is a major risk factor, Individuals from lower socioeconomic classes are more likely to have inadequate health knowledge, poor environmental sanitation, congestion, and a greater proclivity to live in a setting that predisposes to fecal contamination of food and water. We investigated the possible interaction between stomach symptoms of smoking status and *H. pylori* positivity in the current study (table 5) and found that 88.2% of patients with *H. pylori* positivity have gastrointestinal symptoms, with substantial differences ($P = 0.01$). Heartburn, epigastric discomfort, belching, and dyspepsia have all been associated with the persistence of *H. pylori* infection. Smoking is a substantial risk factor for peptic ulcer disease because it enhances stomach acid output and damages the mucosal barrier. Furthermore, the combination of smoking and *H. pylori* infection increases the risk of ulcer development in the same patient. *H. pylori* infection boosts pepsinogen production while lowering mucus production (7). As represented in table (6) in our study, patients in general practice found a significant (P= 0.03) relation between *H. pylori* infection and family history and found that 70.6% of patients had a family history of *H. pylori* infection. The data of results in a study showed that 80.39% of patients who were seropositive of *H. pylori* had a family history and indicated that the difference was significant ($P = 0.001$) (8). An association between *H. pylori* and type of smoking we found from the results in a table (7) that there was no significant relationship between them ($P= 0.6$), although that 50% of patients had *H. pylori* infection was Nargileh smoking and from our results, we concluded that *H. pylori* infection spreads from person to person via the oral route. *H. pylori* infection was shown to be more common among smokers, with a slight but not significant rise in prevalence (5). It should be emphasized that the rate of *H. pylori* infection in smokers was much greater than in non-smokers (9). Strong interactions between cigarette smoking and *H. pylori* were found (10). Tobacco and alcohol diminish mucus production and mucosal blood flow in the gastric mucosa, reducing the gastric mucosa's defensive function and rendering it prone to *H. pylori* invasion (11). Because tobacco use affects the immune system, predisposing the smoker to *H. pylori* infection, cigarette smoking is a key factor in peptic ulcer disease and dyspeptic symptoms.

## V. CONCLUSIONS

We concluded from our research that smoking was a major factor in the seroprevalence of *Helicobacter pylori* and that it had a substantial influence on the seroprevalence of *Helicobacter pylori.* this may be due to hygienic habits involved transmission of bacteria through the saliva of smokers. Regarding the level of education, socioeconomic status, and family history all these factors increased the chance of transmission due to improper hygiene and health care. Age shows a significant effect and the plurality of infections manifested in young and middle age groups than older age. Prevalence of *H. pylori* shows significant value in Nargileh smoking patients and this approved that the transmission of *H. pylori* whereby spread from person to person by oral route.

## REFERENCES

[1] Al-Zyoud, W., Hajjo, R., Abu-Siniyeh, A., Hajjaj S. (2020). Salivary microbiome and cigarette smoking: A first of its kind investigation in Jordan. *International Journal of Environmental Research and Public Health*, 17 (1), 256.

[2] Khalifa, M.A.A.A. & Abd Almaksoud, A. (2014). Cigarette smoking status and *Helicobacter pylori* infection in non-ulcer dyspepsia patients. *Egyptian Journal of Chest diseases and tuberculosis*, 63( 3), 695-699.

[3] Bello,A.K., Umar, A.B., M. Borodo,M. (2018)Prevalence and risk factors for *Helicobacter pylori* infection in gastroduodenal diseases in Kano, Nigeria. *African Journal of Medical and Health Sciences*, 17 (1), 41-46.

[4] Kusters, J.G., VanVliet A.H., Kuipers E. J. (2006). Pathogenesis of *Helicobacter pylori* infection.*Clinical microbiology reviews,*19 (3), 449-490.

[5] Priyadarshini, D. R.., Easow J. M., Vinod R. (2018). Seroprevalence of *Helicobacter pylori* among Healthy Blood Donors. *Int. J. Curr. Microbiol. App. Sci*,7 (2), 817-822.

[6] Lim, S.H. *et al.* (2018). Trends in the seroprevalence of *Helicobacter pylori* infection and its putative eradication rate over 18 years in Korea: a cross-sectional nationwide multicenter study. *PLoS One,* 13 (10), e0204762.

[7] Basílio I. L.D.,Catão, M.D.F.C., Carvalho J. D.D.S.,Freire-Neto, F.P., Ferreira, L.C., Jerônimo,S.M.B. (2018). Risk factors of *Helicobacter pylori* infection in an urban community in Northeast Brazil and the relationship between the infection and gastric diseases. *Revista da Sociedade Brasileira de Medicina Tropical*, 51, 183-189.

[8] Noor, R.M.E.A., Abdalla, W.M., Abd Alla, A.B., Hashim, A.I. (2020).Diagnosis of *Helicobacter pylori* infection using immunochromatography among patients attending Tamboul

DOI: http://doi.org/10.24086/biohs2022/paper.623

Hospital in Gezira State, Sudan: a cross-sectional study. *F1000Research*, 9( 1054), 1054.

[9] Zhu, H.M. *et al.* (2020). Epidemiological investigation of *Helicobacter pylori* infection in elderly people in Beijing. *World Journal of Clinical Cases*,8 (11), 2173.

[10] Collatuzzo, G. *et al.* (2021). Exploring the interactions between *Helicobacter pylori* (Hp) infection and other risk factors of gastric cancer: A pooled analysis in the Stomach cancer Pooling (StoP) Project. *International Journal of Cancer*, 149 (6), 1228-1238.

[11] Fang, J., Liu, W., Li, Z. (2017). Consensus on chronic gastritis in China (2017, Shanghai). *Chin J Dig*, 37, 721-38.

DOI: http://doi.org/10.24086/biohs2022/paper.623