



Prediction of Risk Factors in Sample of Iraqi Patients with Developing Gastritis

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Abstract: The prevalence of gastritis is still elevated all over the world. It is the leading cause of many diseases like atrophic gastritis, peptic ulcer, and adenocarcinoma of the stomach. The current study aimed to assess the risk factors in a sample of Iraqi patients was complaining from gastric symptoms and gastritis. The cross-sectional study was conducted from December 2019 to April 2020. Sixty samples were collected from both patients and apparently healthy group. The demographic characteristics for each group include: age, sex, body mass index, diet habits, smoking history, habitual drinking and drug history. Serums were collected from both groups and anti-*Helicobacter pylori* IgG were done using Enzyme Linked ImmunoSorbent Assay (ELISA). The results revealed that the percentage of those within the age group 30 -50 years old were higher in patients' group. Smoking, spicy food, abuse of Non-Steroid Anti-Inflammatory Drugs and *H. pylori* infection were increased risk of gastritis in a sample of Iraqi patients.

Keywords: Risk factors; ELISA; Gastritis.

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Introduction

The prevalence of gastritis is still elevated in nearly all countries and more than half of the population in the world had gastritis (1). It is the leading cause of atrophic gastritis, peptic ulcer, and adenocarcinoma of the stomach (2). Numerous diverse risk factors are involved like older age group, male sex, ethnicity, inherited family history, and presence of predisposing risk factors for example tobacco smoking, alcohol drinking, exposure to radiations, infection with *Helicobacter Pylori* and eradication of these bacteria is considered the most important plan for the prevention of gastritis and cancer of the stomach (3). In addition to change

different habits like stop smoking and alcohol consumption, early diagnosis of *H. pylori* infection is obligatory for the effective treatment of many diseases that caused by these bacteria like none invasive tests (urea breath test, stool antigen test, serology, and molecular tests) and invasive methods which is endoscopic examination, histology, and culture (4). With the aid of endoscopy, one can expect *H. pylori* induced gastritis by direct visual inspection of gastric mucosa edema, diffuse erythema, enlargement of gastric mucosal folds, and gastric atrophy (5). One of the disadvantages of endoscopic examination is interobserver or intraobserver unpredictability in the visual diagnosis of *H. pylori* infected

gastric mucosa and this need considerable time to perform this job professionally (6). One of the most important complaining symptoms is dyspepsia that affects a large proportion of the population that led to lost work and reduced quality of life and need endoscopy for young age group and *H. pylori* test for older one. After confirmation of infection with this bacterium, should be treated with proton pump inhibitors and acid suppression (7). Thus, single endoscopic examination showed regular arrangement of collecting venules with biopsy that confirmed diagnosis, may be accurate for predicting *H. pylori* status of a patient (8). Obesity is another risk factor for gastritis and people with a body mass index (BMI) of 30-35 have two-fold increased risk compared with people with BMI of <25 and those with a BMI > 40 have a three-fold risk of having disease (9). In addition to that, intake of salty, spicy, and smoked food are probably cause of gastritis due to salt and spice had direct damage to gastric mucosa (10). This study aimed to assess the risk factors in a sample of Iraqi patients was complaining from gastric symptoms and gastritis.

Subjects and methods

The cross-sectional study was conducted between December 2019 to April 2020 at Gastroenterology Endoscopic Department -Al-Kindy Teaching Hospital -Baghdad-Iraq. This study was approved from Ethical by the Council of the Institute of Genetic Engineering and Biotechnology for postgraduate studies / University of Baghdad and Al-Kindy Teaching Hospital. An Informed Consent was obtained from the patients. The inclusion criteria were patients with

epigastric pain, nausea, vomiting, heartburn, indigestion, flatulence, and sense of fullness after eating small amounts of food. Patients with history of gastric cancer, gastroesophageal reflux disease (GERD), and hiatus hernia were excluded from the study. The endoscopic examination was done to patients' group after fasting using to confirm the diagnosis. All patients underwent upper gastrointestinal endoscopic using gastroscope: GIF-H260; Olympus, Tokyo, Japan and Display screen; Olympus OEV-261H liquid crystal display monitor; Olympus, Tokyo, Japan. Endoscopic examinations which were performed by well skilled gastroenterologists. Sixty Serum samples were collected from both patients and control groups and anti *H. pylori* IgG were done using Enzyme Linked Immuno Sorbent Assay (ELISA). The demographic characteristics for each group include: age, sex, body mass index, habitual drinking, smoking history, diet habits and drug history.

Statistical analysis

The Statistical Analysis System-SAS (2012) program was used to detect the effect of difference factors in study parameters. T-test and Least significant difference -LSD test (Analysis of Variation-ANOVA) was used to significant compare between means. Chi-square test was used to significant compare between percentage (0.05 and 0.01 probability). Estimate of Odd ratio and CI. Estimate of correlation coefficient between variables in this study.

Results

The demographic characteristics for each group include: age, sex, body mass

index, habitual drinking, smoking history, diet habits and drug history which considered as risk factors for gastritis presented in the table (1). The ages of patients group and apparently healthy group was ranged between (18-75 years old) with mean \pm SE of 37.73 ± 2.10 and 37.86 ± 1.65 years, respectively. In this study, there were three age groups (less than 30, 30 - 50 and more than 50 years old). The percentage of those with less than 30 years old was lower in patients group compare with apparently healthy group (26.67% versus 31.67%, respectively). Whereas, the percentage of those within the age group 30 -50 and more than 50 years old were higher in patients group compare with apparently healthy group (56.67% versus 53.33% and 16.66% versus 15% respectively).

Regarding gender distribution, the selection of patients and control samples were randomly. Therefore, sex distribution only reflects the presence of samples in the time of collection. Among sixty gastritis patients were 30 (50%) males and 30 (50%) females, whereas the control group was included 27(45%) males and 33 (55%) females.

Other parameter was Body mass index is simple index calculated based on weight and height data and used in wide variety of contexts to assess how much an individual's body weight departs from what is normal or desirable. World health organization (WHO) regards a BMI less than 18.5 as underweight and may indicate malnutrition while a BMI greater than 25 is overweight and above 30 is considered obese (WHO, 2017).

Table (1): The demographic characteristics of gastritis patients and apparently healthy individuals.

Parameters	Gastritis patients No. (%)	Control No. (%)	p-value
Age (year)			
> 30	16 (26.67)	19 (31.67)	0.381 NS
30 – 50	34 (56.67)	32 (53.33)	0.497 NS
< 50	10 (16.66)	9 (15)	0.866 NS
Gender			
Male	30 (50)	27 (45)	0.217 NS
Female	30 (50)	33 (55)	0.217 NS
Body mass index (BMI)			
18.5 – 25	19 (31.67)	15 (25)	0.126 NS
25.1 – 30	21(35)	26 (43.33)	0.067 NS
> 30	20 (33.33)	19 (31.67)	0.208 NS
Alcohol consuming			
Yes	3 (5)	0 (0)	0.308 NS
No	57 (95)	60 (100)	0.308 NS
Smoking status			
Yes	25 (41.67)	10 (16.67)	0.0063 **
No	35 (58.33)	50 (83.33)	0.0063 **
Diet habits			
Spicy food	16 (26.67)	9 (15)	0.0433 *
Vegetable and fruits	12 (20)	20 (33.33)	0.0372 *
Drug history			
NSAIDs	33 (55)	11(18.33)	0.0006 **

* (P \leq 0.05), ** (P \leq 0.01), NS: Non-Significant.

Analysis the present BMI indicate that the control group tended to be lower in both normal weight (18.5-25) and obese (BMI more than 30) when comparison with patients' group (25% versus 31.67% and 31.67% versus 33.33%, respectively). In contrast, the control group tended to be more overweight (25.1-30) in comparison with patients' group (43.33% versus 35%, respectively).

Other risk factor was Alcohol drinking, in current study results revealed that alcohol drinking was not differ notably between patient and control groups (5% versus 0%, respectively). The present data analysis shows that the proportion of smoker individuals was higher in patients' group comparison with control group (41.67% versus 16.67%, respectively) and there is significant association between gastritis and smoking. Whereas the percentage of non-smoker individuals was lower in gastritis patients than in control group (58.33% versus 83.33%, respectively). According to diet habits, the percentage of individuals that was eaten spicy food higher in patients' group than control group (26.67% versus 15%, respectively). On contrary, the percentage of individuals that have eaten fruits and vegetables was higher in control group than patients' group (33.33% versus 20%, respectively). Drug history had an important role in gastritis and this study revealed that the

percentage of individuals that have Non-Steroid Anti-Inflammatory Drug (NSAIDs) was higher in gastritis patients than in control group (55% versus 18.33%, respectively) and there was significant association between gastritis and NSAIDs in Iraqi patients.

ELISA was used to determine anti-*H. pylori* IgG antibodies. The results in the table (2) revealed that higher seropositive percentage of anti-*H. pylori* IgG antibodies found in the sera of gastritis patients' comparison with control group (38.60% versus 9.61%, respectively) with high statistically difference ($X^2= 8.91$, $P \leq 0.01$) and positive *H. pylori* IgG antibodies tend to increased odds ratio of having gastritis by 1.39 times (95% CI, 0.87-1.79). In contrast, the percentage of negative anti-*H. pylori* IgG antibodies was significantly higher ($X^2= 10.64$, $P \leq 0.01$) in the sera of control group than in patients' group (42.31% versus 8.77%, respectively), negative anti-*H. pylori* IgG antibodies tend to decreased odds of gastritis (OR= 1.72, 95% CI, 1.05- 3.36). whereas there is no significant difference ($X^2= 0.995$) in the percentage of weak positive *H. pylori* IgG antibodies that found in the sera of both patients and control groups (52.63% versus 48.08%, respectively) and the weak positive anti-*H. pylori* IgG antibodies occurred to be had odds less than 1 (OR= 0.366; 95% CI, 0.18-0.65).

Table (2): Serological examination of anti- *H. pylori* IgG antibodies in the gastritis patients and control groups.

Anti – <i>H. pylori</i> IgG	Gastritis patients No. (%)	Control No. (%)	χ^2	OR	95% CI
IgG positive	22 (38.60)	5 (9.61)	8.91 **	1.39	0.87-1.79
IgG negative	5 (8.77)	22 (42.31)	10.64 **	1.72	1.05-3.36
IgG weak positive	30 (52.63)	25 (48.08)	0.955 NS	0.366	0.18-0.65
Total	57 (100)	52 (100)	--	--	--
Samples range between (8-12 IU/ml) IgG concentration considered cut off and excluded. ** (P<0.01), NS: Non-Significant.					

Discussion

In this study, the highest incidence of gastritis was observed occur between third and fifth decade. The results agree with Mahmoud *et al.* (10) who stated that the prevalence of gastritis increased with age and the highest incidence was occurred with age > 40 years old (11). These finding also agree with studies conducted in KSA and China (12, 13). kekki and his colleagues suggested that age can be crucial factor for having gastritis due to thinning stomach lining with aging (14). Aging is related with a decreased rate of gastric epithelial cell turnover and a decreased ability to repair the gastric mucosa which is due to decrease levels of prostaglandin in the gastric mucosa (15). However, our explaining for this result, with aging the exposed to environment factors are increased such as infected with *H. pylori* and other infectious agent which could impact on gastrointestinal tract and also behavioral habit such as smoking, eating habit, alcohol drinking and administrated some medication will be more complex with aging. Regarding gender distribution, there were no statistically differences in sex distribution observed. This similar with a study done in Karbala and other studies that showed the frequency of gastritis was analogical in both sexes (16, 17). Concerning BMI, several studies reported that the obesity and overweight associated with gastritis (18, 19, 20). In current study, result shown no association between BMI and gastritis incidence and this agree with researcher in (21) that reported there is no association between BMI and gastritis in Kazakhstani population and also stated there were similar results obtained from other researchers who finds that the patients with atrophic

gastritis has significantly lower BMI values than non-atrophic gastritis group in Japanese population (22, 23).

According to Alcohol drinking, many studies show that alcohol consuming induce acute inflammation thereby can play important role increase the risk of chronic gastritis (24, 25, 26). Results revealed that alcohol drinking doesn't play role in gastritis incidence in Iraqi patients; this may relate to Arabic- Islamic tradition and customs that prohibited alcohol drinking. About smoking, some studies reported that there was association between smoking with gastritis incidence (27, 11, 28). The mechanism by which smoking affected on stomach may by: increased synthesis of reactive oxygen species reduces the synthesis of prostaglandin in the gastric mucosa, decreases the barrier function of gastric mucosa and in addition some studies have been found that Interleukin 8 and two other cytokines are increased in the gastric mucosa of smokers compared to nonsmokers (29, 30). IL-8 is secreted from epithelial cells which is an important factor in defense mechanism at mucosal sites and significant chemotactic and activating factor for neutrophils at gastric mucosa and continued upregulation of IL-8 and neutrophil activation lead to gastric mucosal damage and increased free radical formation ending with gastritis (31).

Diet habit is also important in inducing gastritis and the result disagrees with researcher in (11) and agrees with study conducted by (28) that found hot and spicy food were statistically significant with having gastritis but, were not from the most important factor related and contributed with gastritis. Fruit and vegetables contain antioxidant and many studies

suggested it have advantageous effected against gastritis and gastric cancer (32 - 35), while others studies obtaining no statistically significant results (36-38). The discrepancy among the results a mentioned above may attributed to the difference among race that have different dietary habits or may related to size of samples that studied. Therefore, more studies should be performed in area of diet habits and gastritis.

Regarding to drug history, NSAIDs are frequently used to treat inflammatory pain such as osteoarthritis, Rheumatoid arthritis, low back pain and headache. The number of people that are administrated this drug has grown significantly with increasing use of over-the-counter and prescription NSAIDs, low-dose aspirin and after reports of their potential antineoplastic effects but, a major limitation to their use, is the adverse reaction they cause to the gastrointestinal (GI) tract, including Gastric and duodenal mucosal erosions, gastroduodenal ulcers, the impairment of gastric ulcer healing, hemorrhage, perforation and even fatality due to complications of ulceration that can occur (39- 41). NSAIDs use considered the second risk factor in chronic gastritis in general population (42). Gastric injury is more likely to be more severe and has a higher possibility to be localized in the antrum than the corpus (43). The results of drug history of this study agreed with several researchers (44, 42, 45, 11). The prevalence of *H. pylori* infection in developed countries is 34.7% whereas the prevalence is 50% in the developing countries (46,47). In this study the percentage of *H. pylori* infection prevalence in gastritis patients closely to study conducted by (48) that found the seropositivity of *H. pylori* IgG with dyspepsia patients in Saudi

Arabia was 33.5% compared to 13.8% among control group. Other studies conducted in Saudi Arabia show that the prevalence of infection rate in subjects with gastritis was 66.4 – 87% (49,50). In Iran the infection rate with gastritis was 50 – 86,6 % (51,52), while the infection rate was 30.2 – 82.9% in Egyptian patients with gastritis (53,54). These differences may be due to samples size of study, low socioeconomic status, poor hygiene, ethnicity, age, overcrowding and life style for individuals that included in the study.

Limitation of this study was small sample size and difficulties in doing endoscopy in some patients.

Conclusions

Smoking, spicy food, abuse of Non-Steroid Anti-Inflammatory Drugs and *H. pylori* infection were increased risk of gastritis in a sample of Iraqi patients.

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