Seroprevalence of *Helicobacter pylori* infection and its risk factors among adult patients suffering from gastrointestinal tract disorders in Zeliten city, Libya

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الملخص:

البكتيريا الحلزونية (*H.pylori*) شائعة في المرضى الليبيين الذين يعانون من أعراض عسر الهضم المزمنة، وعادة ما تكتسب في مرحلة الطفولة المبكرة المرتبطة بالاضطرابات العديدة للجهاز الهضمي العلوي. الهدف من الدراسة هو تحديد الانتشار المصلي للعدوى بالبكتيريا الحلزونية وعوامل الخطر لدى المرضى البالغين الذين يعانون من أمراض الجهاز الهضمي في مدينة زليتن، ليبيا تم تقييم مستويات الانتشار المصلي للأجسام المضادة نوع الغلوبولين المناعي IgM ونوع الغلوبولين المناعي IgG للبكتيريا الحلزونية بواسطة استخدام تقنية مقايسة الممتز المناعي المرتبط بالأنزيم (ELISA) لعدد 193 حالة شاركوا في الدراسة التي أجريت في مستشفى زليتن التعليمي. أوضحت النتائج أن 79.8% من نوع الغلوبولين المناعي IgM و78.2% للغلويولين المناعي IgG من المجموعة الذين شملتهم الدراسة كانت النتائج لها دلالة معنوية مرتبطة تحت احتمالية (P<0.05) مع العمر الحالات موجبة الضد للبكتيريا الحلزونية لم تظهر عليها أعراض التهاب المعدة كانت نسبة 30.1% للـ IgM بينما كانت 49.7% من الحالات التي ظهرت عليها أعراض التهاب المعدة الحالات موجبة الضد للبكتيريا الحلزونية والتي لم تظهر عليها أعراض التهاب المعدة كانت نسبة 27.6% للـ IgG بينما الحالات التي ظهر عليها أعراض التهاب المعدة كانت 50.7% هذه النسبة العالية ربما ترجع إلى اشتراك عدة عوامل كفقدان المرافق الصحية السليمة والعادات الصحية والنظافة الاساسية.

ABSTRACT.

Helicobacter pylori (HP) is common in Libyan patients with chronic dyspeptic symptoms. It is usually acquired in early childhood and related to numerous upper gastrointestinal disorders.Aim of this study is to determine the seroprevalence of *Helicobacter pylori* infection and its risk factors among adult patients suffering from gastrointestinaltract disorders in Zeliten city, Libya. The seroprevalence levels of IgMand IgG antibodies to *H. pylori* were assessed by an enzyme-linked immunosorbent assay techniques in 193 cases who participated in the study in Zeliten teaching hospital. Results showed that 79.8% forIgM and 78.2% for IgG from the study population had observed and significantly correlated ($p<0.05$) with age. The positive anti -*H. pylori*IgM for cases with no gastritis was 30.1 %, while those with gastritis were 49.7 %. The positive anti -*H. pylori*IgG for no gastritis was 27.6 %, while gastritis was 50.7 %.This high % may probably be an involvement of multi-factors, lack of proper sanitation and basic hygiene.

KEY WORDS: Helicobacter pylori, GIT disorder, Zeliten, Libya.

INTRODUCTION.

Helicobacter pylori (*H*P), a cause of peptic ulcer disease, gastric adenocarcinoma and low-grade gastric mucosa associated lymphoid tissue (MALT) lymphoma and gastric cancers in adults[1] and it has been falling due to improved sanitation and better living conditions[2].HP is found in half the population of the world[3]. Its prevalence is highly variable in relation to geography, ethnicity, age, and socioeconomic factors. The incidence of HP infection in the developing world is higher than developed countries [4,5]. High prevalence rates are reported in Greek, Italian, Lebanese, Chinese, Vietnamese and Algerians. In contrast, Australian aboriginals have very low HP prevalence.[6] Mostly direct contact between people (oral-oral or fecal-oral) is regarded as the main route of transmission of infection, followed by contaminated sources of water and food[7].Adverse effects of H. *pylori* infection are widely reported. But rare studies were carried out in Libya addressing this problem. This study was aimed to detect the Seroprevalence of *Helicobacter pylori* infection and its risk factors among adult patients suffering from gastrointestinaltract disorders in Zeliten city population, Libya.

MATERIALS AND METHODS.

A sero-survey of H. *pylori*IgG and IgM-antibody in 200 cases of Out (100 nos.) and in-patients (100 nos.) during the period from January 2016 to September 2016 at the clinics in Zeliten teaching hospital and Zeliten city population. Five ml of venous blood was collected from each patient and healthy person (blood donor) involved in the study without anticoagulant according to standard techniques and allowed the samples to clot and after 20 minutes serum was collected by centrifugation (Hittachi, Germany) at 3000rpm. Qualitative detection of H. *pylori* antibodies like IgG and IgM in this study by using ELISA testing Kit (BioChek, Inc. 323, Vintage Park Drive, Foster City, CA94404 USA)and the tests were performed according to the manufacturer guidelines. The collected data were analyzed by SPSS software version 1.3 and the statistical analysis was performed using Chi-square and student's test. Logistic regression models were used to assess the relationship between   risk factors of *H pylori* infection response and variables with significant factor (*P*< 0.05).

RESULTS AND DISCUSSIONS.

Epidemiological surveys usually use serological tests for high sensitivity and specificity which will not limit the accuracy of prevalence estimates[8]. The complexity and uncertainty related to the geographic distribution of H. *pylori* infection, determination of its associated risk factors and evaluation of cofactors that accelerate its progression, underscore the difficulties in global prevention and control of H. *pylori*. The epidemiology of HP infection in Libyan population remains important for public health investigation because of high prevalence of this infection and its association with peptic ulcers and chronic dyspepsia [9]. The distribution of cases included in the study according to nongastritis and gastritis are showed in the Table 1.The positive anti H. *pylori*IgM for nongastritis was 30.1 %, while gastritis was 49.7 %. The positive anti H. *pylori*IgG for nongastritis was 27.6 %, while

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gastritis was 50.7 %.This finding is agreed with the findings in study done by Hassan (2011) [10]in Iraq to detection of IgG and IgM Antibodies to *Helicobacter Pylori* in Serum by an ELISA method.

Table 1: Seroprevalence to anti *H. pylori*IgM and IgGaccording to nongastritis and gastritis.

Disease	IgM				IgG			
	+	%	-	%	+	%	-	%
Nongastritis	58.0	30.1	17.0	8.8	53.0	27.6	22.0	11.4
Gastritis	96.0	49.7	22.0	11.4	98.0	50.7	20.0	10.4
Total	154.0	79.8	39.0	20.2	151.0	78.2	42.0	21.8

The total prevalence of anti *H. pylori*IgM for both male and female was found to be 79.8%positive, anti *H. pylori*IgM in males was 38.9%,while positive anti *H. pylori*IgM in females was 40.9% (Table 2). The total prevalence of anti *H. pylori*IgG for both male and female was found to be 78.2%positive, anti *H. pylori*IgG in males was 36.8%, while Positive anti *H. pylori*IgG in females was 41.6%. This finding is line with the findings in study carried out by Elhagand Ali (2014).[11]

Table 2: Seroprevalence to anti *H. pylori*IgM and IgG according to gender.

Gender	IgM				IgG			
	+	%	-	%	+	%	-	%
Male	75.0	38.9	21.0	10.9	71.0	36.8	25.0	12.6
Female	79.0	40.9	18.0	9.3	80.0	41.6	17.0	8.8
Total	**154.0**	**79.8**	**39.0**	**20.2**	**151.0**	**78.2**	**42.0**	**21.4**

The Table 3 has showed anti *H. pylori*IgM and IgG prevalence according to age. The total prevalence of anti *H. pylori*IgM for all age groups was found to be 68.9% and the prevalence of anti *H. pylori*IgG was found to be 67.3%. Positive anti *H. pylori*IgM in age group 15 - 35 years old was 25.4%, while Positive anti *H. pylori*IgG was 23.3%, Positive anti *H. pylori*IgM in age group 36-55 years old was 24.9%, while Positive anti *H. pylori*IgG was 31.1% and positive anti *H. pylori*IgM in age range 56-75 years old was 12.4% while Positive anti *H. pylori*IgG was 9.8%. Positive anti *H. pylori*IgM in age range 76-95 years old was 6.2%, while Positive anti*H. pylori*IgG was 3.1%. On contrast seropositivtyto anti*H. pylori*IgM was more than 68.9% compared with seropositivtyto anti*H. pylori*IgG 67.3%. This result is on contradictory to the findings of Mohammed et al., (2011)[12] and Waleed et al., (2010) [13]. Mohammed et al., (2011) studied in Benghazi (Libya) and reported that more than half (53.3 %) of children aged 1-12 years and most of middle age and elderly subjects (84.6 %) were seropositive. But similar result was observed in another recent

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Benghazi study by Khaled and Ramadhan (2016).[14] They also reported that 33.6% seroprevalence has been found in subjects of an age of (20<30) years, which regularly decreased with age and get to 8.8% in subjects up to an age of ($60 \leq$) years of age.

Table 3: Seroprevalence to anti *H. pylori* IgM and IgG according to age.

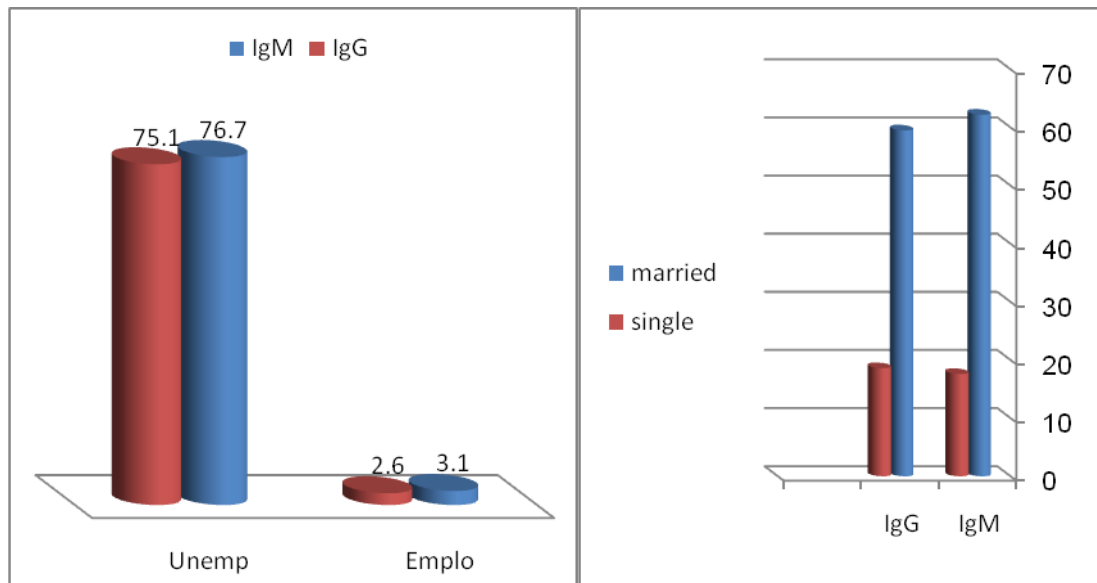| Age (years)	IgM				IgG			
	+	%	-	%	+	%	-	%
15 -35	49.0	25.4	9.0	4.7	45.0	23.3	13.0	6.7
36 – 55	48.0	24.9	21.0	10.9	60.0	31.1	9.0	4.7
56 – 75	24.0	12.4	4.0	2.1	19.0	9.8	8.0	4.1
76 -95	12.0	6.2	5.0	2.6	6.0	3.1	11.0	5.7
Total	133.0	68.9	39.0	20.3	130.0	67.3	41.0	21.2

Figure 1: Seroprevalence to anti *H. pylori* IgM and IgG according to occupation.

Figure 2: Seroprevalence to anti *H. pylori* IgM and IgG according to marital status

The mean value of seropositive cases for *H. pylori* IgM and IgG in unemployed were high compared with employed (Fig.1). Figure 2 represents the Seroprevalence to anti *H. pylori* IgM and IgG according marital status. Both IgM and IgG are more in married people than the single.

Statistical analysis showed weak insignificant correlations between the anti IgM with disease, sex, age, occupation and marital status for anti H. pylori (IgM), while for (IgG) seropositivity is significantly negative correlated with disease (gastritis) and significant positive correlated with age (Table 4). Elhag and Ali (2014)[11] has also found the same result with insignificant correlation between age,

gender, genetic susceptibility and presence of *H. pylori* antibodies(P>o.o5). High prevalence rate of H.Pylori infection were also observed in other studies in Iran [15, 16], Egypt [17, 18, 19] Libya[20] and Tunisia[21] and United Arab Emirates.[22]

Table 4: The correlations between the anti IgM, IgG,disease, sex,age,occupation and marital status.

Correlations

		IgM	IgG	Disease	sex	age	occupation	statues
IgM	Pearson Correlation	1	-.047	-.049	-.041	.046	-.025	-.041
	Sig. (2-tailed)		.521	.500	.568	.525	.732	.576
	N	193	193	193	193	193	193	193
IgG	Pearson Correlation	-.047	1	-.146*	-.103	.223*	-.016	-.120
	Sig. (2-tailed)	.521		.042	.153	.002	.822	.095
	N	193	193	193	193	193	193	193
Disease	Pearson Correlation	-.049	-.146*	1	.334*	.157*	.101	-.158*
	Sig. (2-tailed)	.500	.042		.000	.029	.163	.029
	N	193	193	193	193	193	193	193
sex	Pearson Correlation	-.041	-.103	.334*	1	.063	.001	-.167*
	Sig. (2-tailed)	.568	.153	.000		.383	.988	.020
	N	193	193	193	193	193	193	193
age	Pearson Correlation	.046	.223*	.157*	.063	1	.103	-.479*
	Sig. (2-tailed)	.525	.002	.029	.383		.153	.000
	N	193	193	193	193	193	193	193
occupation	Pearson Correlation	-.025	-.016	.101	.001	.103	1	-.337*
	Sig. (2-tailed)	.732	.822	.163	.988	.153		.000
	N	193	193	193	193	193	193	193
statues	Pearson Correlation	-.041	-.120	-.158*	-.167*	-.479*	-.337*	1
	Sig. (2-tailed)	.576	.095	.029	.020	.000	.000	
	N	193	193	193	193	193	193	193

*. Correlation is significant at the 0.05 level (2-tailed).

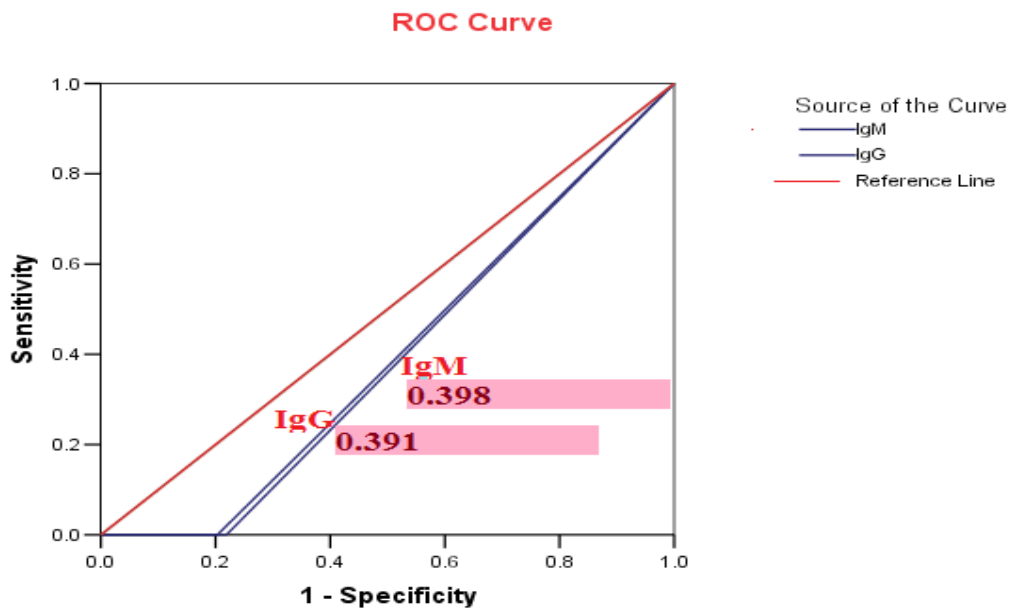**. Correlation is significant at the 0.01 level (2-tailed).

Figure 3: The ROC curve of Anti H. pylori IgM and IgG.

A receiver operating characteristics (ROC) curve was generated for each antibody tested in samples from Zeliten. The ROC area under the curve for IgG (0.391) was lower than the area for IgM (0.398), the diagonal segments are produced by ties. No statistically significant differences in ROC curves were noted between subjects for IgG, and IgMserologies this may be due to size of samples included in this study.

CONCLUSION.

Based on the findings of this study, we can conclude that the Zeliten area is seemingly endemic with the *H. pylori.*The total, 79.8% for IgM and 78.2% for IgG from the study population had observed. This is probably due to living with poor sanitation, low socioeconomic status and lack of basic hygiene are independent risk factors for *H. pylori* infection. Socioeconomic deprivation significantly modifies the prevalence of HP infection as others have been shown.

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