Helicobacter pylori infection Evluated by C14-urea Breath test and it`s Relation with age, sex and ABO/Rhesus blood Groups in Patients with Gastrointestinal complaints in Kirkuk City / Iraq.

Nadia. M. Mohammad[1] , Sabah M. Salih[2]

[1] *Department of Biology , College of Education for Pure Sciences , Tikrit University , Tikrit , Iraq*

[2] *College of Nursing, University of Kirkuk, Kirkuk, Iraq*

https://doi.org/10.25130/tjps.v24i4.389

ABSTRACT

There was significant difference between genders and *H. pylori* infection ($P<0.05$). From the 176 patients attending private laboratories in Kirkuk city for the period from 1/8/2016 to 1/4/2017, 86(48.86%) belonged to blood group O, 42(23.86%) to A, 41(23.29%) to B and 7 (3.97%) to AB and There was statistically significant difference ($P<0.05$) in the incidence of *H. pylori* infection between these groups, there was significant correlation between the presence of particular blood group in *H. pylori* positive patients related to the reported frequency of the blood groups in Kirkuk population, the correlation between the Rh factor and positive *H. pylori* patients was not significant to the frequency of the Rh factor in the population (88.06% Rh+ and 11.93% Rh-). the *H. pylori* positive test was slightly, but not significantly lower in comparison with the negitive *H. pylori* patients test values showed a highly significant difference ($P<0.01$) in *H. pylori* posative and *H. pylori* negitive patients., in adults *H. pylori* infection depend upon gender, blood groups but they do not depend upon the Patients age or Rh factore.

Introduction

Gastric *Helicobacter pylori* infection is quite frequent with an incidence more than 50% in some parts of the world [1]. Development of symptoms after infection depends also with the physical status, eating habits and immune response for the patients [2]. Long-term consequences can include chronic superficial gastritis, gastric ulceration or duodenal, gastric mucosa associated lymphoid tissue lymphom.(with or without progressive atrophy) the presence of *Helicobacter pylori* can be related with some non-digestive diseases, such as autoimmune diseases, ischemic heart disease, late puberty, delayed grow-up etc. [3-5].

In the stomach environment, *H. pylori* has a unique way of adapting. to infect gastric epithelial cells with It goes through the mucous layer and produces enzymes that break down substances contained in gastric juices. Urease is the most important of these enzymes. Urease converts urea from gastric juices and saliva into bicarbonate and ammonia, which are thus protect *Helicobacter pylori* from stomach acidity. Carbon dioxide is absorbed into the bloodstream and excreted by the lungs. Urease is found in much higher concentrations in infections from any other bacteria, thus enabling *Helicobacter pylori* test. Thus, when an infected patient swallows a dose of urea labeled with a radioactive carbon-14 (C14) *Helicobacter pylori*, in his gastric mucosa breaks down the labeled urea to ammonia and labeled CO2, which is being absorbed and exhaled. After the collection of a certain amount of 14CO2, its activity is measured by beta counter [6-11]. During the last few decades, some authors suggestted that there was a relation between *Helicobacter pylori* attachment to gastric epithelium and only blood groups O [12-17] while others never realize such correlation between .*Helicobacter. pylori* and blood groups [18].

The stady focwses on the relationship between *Helicobacter. pylori* infection and age, ABO blood groups, Rhesus (Rh)factor, patients sax and age as well as the clinical importance of the test in many different gastrointestinal disorders.

Patients and methods

The total of 176 patients with gastritis were examined. Blood ABO blood groups and Rh factor positivity were studied using (Lorne laboyatories Ltd.) standard routine tests. Gastric infection by *Helicobacter. pylori* was proved by the C^{14}-urea breath test using a commercially available kit (27kBq/dose).The *Helicobacter.pylori* investigation was carried out under fasting conditions in patients who had not taken sucralphates or proton pump inhibitors during the last 4 weeks and were not to take these for another 2weeks after treatment. samples of radioactivity in the exhaled air were collected and measured, 30min after ingestion of the C^{14} urea capsule for the determination of test values.. Descriptive and analytical statistical method were performed by using statistical percentage .

Results

Patients were of a very heterogeneous age group 15-75 years, T test showed that the presence of *Helicobacter pylori* did not depend on the patient's with age (P<0.05).

Table (1) Number and Percentage of infection Patients with *Helicobacter.pylori* according to Age(year).

Age group (year)	H. pylori + %	%H. pylori- %	Total %
15-24	16 (13.3)	5 (8.9)	21 (11.9)
25-34	21 (17.5)	17 (30.3)	38 (21.5)
35-44	43 (35.8)	13 (27.2)	56 (31.8)
45-54	19 (15.8)	11 (19.6)	30 (17)
55-64	14 (11.6)	8 (14.2)	22 (12.5)
65-74	7 (5.8)	13 (23.5)	9 (5.1)
Total	120 (68.18)	56 (31.81)	176 100%
Chi-square=7.459 ns		p-value=0.189	

There was significant difference between sex and *Helicobacter pylori* infection (P>0, 05).From the total of 176 patients,86 (48.86%) belonged to blood group O, 42(23.86%) to blood group A, 41(23.29%) to blood group B while 7 (3. 97%)to AB. blood group. Chi-square test showed statistically significant difference (P<0.05) between these groups, indicating that infection did relate to particular blood group.,

Table (2) Number of *Helicobacter pylori* infection according to sex and ABO/Rhesus blood Groups.

groups	total	male+	male-	total	Femal+	Femal-	total	%
O	31	22	9	55	38	17	86	48.86
A	18	10	8	24	18	6	42	23.86
B	12	8	4	29	20	9	41	23.29
AB	4	1	3	3	3	0	7	3.97
total	65	41	24	111	79	32	176	100
ns Ch Chi-square =1.571 p-value=0.141				ns Chi-square=3.822 p-value=0. 281				
* Chi-square=6.828 p-value=0.047								

Table (3) The Number and Percentage of *Helicobacter.pylori* according toABO/ Rhesus blood Groups.

H.pylori infection	Rh+ %	Rh- %	Total
Ve+	106 (88.33)	14 (11.66)	120
Ve-	49 (87.5)	7 (12.5)	56
Total	155 (88.06)	21 (11.93)	176 (100)
Ns Chi-square=0.025		p-value=0.874	

From a total number of patient 21 (11.93%) were Rh-,and 155 (88.06%) were Rh+, while 14 (11.66%) Rh- patients and 106 (88.33%) Rh+ patients were *Helicobacter pylori* +. Chi square test showed No statistically significant difference (P<0.05) in the above mentioned groups, indicating that the presence of *Helicobacter pylori* did not relate to the Rh factor. patients. Basic and test values of the measured counts in the exhaled air, were estimated in all patients. Basic values were measured before ingestion of the C^{14}-urea capsule

Helicobacter pylori positive 120 (68.18%), *Helicobacter pylori* present in their gastric mucosa, while 56 were negative (31.81%). As basic values we consider a number of counts per minute obtained from the bottle with the trapped exhaled air initially, and as reference values we consider the value obtained with the same procedure 30min after ingestion of the radioactive capsule. T test showed no statistically significant difference (P<0.05) in the basic values of the 14C breath test in positive patients in comparison to negative ones. Related to the test values, T test maintained that a highly (P<0.01) significant difference in the actual values of the 14C breath

test measured in positive and negative patients. In clinical terms, can conclude that this test was highly accurate.

Discussion

Blood group is a risk factor for acquiring *Helicobacter pylori* infection [18,20]. In other studies, most prevalent blood group was blood type O

(40%), subjects with blood group O show increased susceptibility to *Helicobacter pylori* infection than those with other blood groups (P<0.05) [21,22]. Similar to our results Jaff results viewed that *Helicobacter pylori* positivity was related to sex and ABO blood groups many studies have failed to find an association between ABO blood groups and peptic ulcer disease. Many other studies have also failed to find any association between blood group and *Helicobacter pylori* infection. [23]. Others also found no significant correlation between sex, ABO blood groups with positivity[24]. However, Others showed that *Helicobacter pylori* positivity increased with age also was not related to sex nor the blood groups [25]. other authors showed slightly results, like a relationship between blood group A and *Helicobacter pylori* infection [26, 27] and suggested that ABO blood groups may partly influence the prevalence of *Helicobacter pylori* infection, especially in males, and that it increased with age [27]. Others found that patients with blood groupsA and O were more prone to *Helicobacter pylori* infection, and patients with AB blood group were less prone, and that this *Helicobacter pylori* positivity could also be related to age, sex, and smoking [28].

Others emphasized blood group O as moderate risk factor for [29]. The differences between the frequencies of the ABO blood group phenotypes among *Helicobacter pylori* infected and noninfected patients were considered as indicating a relation between infection and ABO blood groups [30]. In separate studies, the ABO phenotype has been linked with stomach ulcers, which are more common in individuals with blood group O[31]. Bacteria expresses lipopolysaccharides on its outer membrane including blood group antigen-binding adhesion A (BabA adhesion) which causes adhesion of bacteria to gastric epithelium and allow persistent colonization [32]. In well documented studies, O blood group has been found to have a frequency of about 45%, A-group about 41%, whereas B is 10% and AB only 4%.[33].

Conclusion

in adults, *Helicobacter pylori* infection does not depend upon the patient's age and Rh. Througheut investigation and focwsing on blood groups and gender, it is noted that 14C-urea breath test test was highly accurate.

References

[1] Milosavjevic, T. (2013). *Helicobacter pylor* sistema: Petnaest godina kasnije. Arch Gastroenterohepatol oboljenja digestivnog_8; 17: 1-10.

 [2] Leide - Svegborn, S.: Stenstrom, K. and Olofsson, M.(1999) .Biokinetics And radiation doses for carbon-14 urea in adults and childrenundergoing the *Helicobacter pylori* breath test. *Eur J Nucl Med*; 26: 573-80.

[3] Kaul, A.: Bhasin, DK. And Pathak, CM. (1998). Normal limits of 14C-urea breath test. Trop Gastroenterol; 3: 110-3.

[4] Jensen, G.: Friedenberg, and F. Levine G. (1998). Accuracy and clinical utility of the mini-dose 14C-urea breath test in the evaluation of the *Helicobacter pylori* infection. Nucl Med Commun; 19: 771-5.

[5] Marshall, B.J .and Surveyor I.(1988). Carbon-14 urea breath test for the diagnosis of *Helicobacter pylori* associated gastritis. JNM;29: 11-6

[6] Raju, GS. : Smith, MJ. And Morton, D (1994). Mini-dose (1 microCi) 14C-urea breah test for the detection of *Helicobacter pylori*. *Am JGastroenterol*; 89: 1027-31.

[7] Faigel, DO.: Childs, M.. and Furth, EE.(1995). New non-invasive tests for *Helicobacter pylori* infection. Gastroenterology; 109: 136-41

[8] Suvajdzic, N.: Stanković, B.and Artiko ,V. (2006). *Helicobacter pylori* eradication can induce platelet recovery in chronic idiopathic thrombocytopenic purpura. *Platelets*; 17: 227-30.

[9] Artiko, V.: Davidovic, B. And Petrović, N. .(2005).Radionuclide detection of *Helicobacter pylori* infection. Glas Srp Akad Nauka Med;48: 85-90.

[10] Artiko, VM..: Obradovic, VB. And Petrović, NS .(2001). 14C-urea breath test in the detection of *Helicobacter pylori* infection. Nucl Med Rev Cent East Eur; 4: 101-3.

[11] Artiko, VM: Obradović, VB. and Petrovic, NS. (2001). Application of 14C urea test in the detection of *Helicobacter pylori* infection. *Medicus*; 2: 38-40.

[12] Boren, T: Falk, P. and Roth, KA. (1993). Attachment of *H. pylori* to human gastric epithelium mediated by blood type group antigens. Science; 262: 1892-5.

[13] Atherton, JC.: Tham, KT. and Peek, RM. Jr. (1996). Density of *Helicobacter pylori* infection in vivo as assessed by quantitative culture and histology. *J Infect Dis*; 174: 552-6 .

[14] Clark, CA.: Wyn, EJ. and Haddock, DRW. .(2014) ABO blood groups and secretor character in duodenal ulcer. *Br Med J*; 2: 725-31

[15] Mentis, A.: Blackwell, CC.. and Weir, DM. (1991).ABO blood group, secretor status, and detection of Helicobacter pylori among patients with gastric or duodenal ulcers. Epidemiol Infect; 106: 221-9.

[16] Aird, I, Bentall, HH .and Mehigan, JA.(2011). The blood groups in relation to peptic ulceration and carcinoma of colon, rectum, breast, and bronchus; an association between the ABO groups Research. Hellenic Journal of Nuclear Medicine January - April 2and peptic ulceration. *Br Med J* 1954; 7: 315-21.

[17] Loffeld, RJ. and Stobberingh, E. (1991). *Helicobacter pylori* and ABO blood groups. J Clin Pathol; 44: 516-7.

[18] Niv, Y.: Fraser, G.and Delpre, G. (1996). *Helicobacter pylori* infection and blood groups. Am J Gastroenterol; 91: 101-4.

[19] Bayan, K.: Tózón ,Y and, ilmaz , S. (2009). Clarifying the relationship between ABO/Rhesus blood group antigens and upper gastrointestinal bleeding. Dig Dis Sci; 54: 1029-34.

[20] Tadege, T.: Mengistu Y. And Desta, K. (2005). Seroprevalence of *Helicobacter pylori*. Infection in and its relationship with ABO blood groups. Ethiop J Health Dev; 19: 55-9.

[21] Tzee-Chung W, Liang-Kung Ch. And Shinn-Jang, H.(2003). Seroprevalence of *Helicobacter pylori* in school-aged Chinese in Taipei City and relationship between ABO blood groups. World J Gastroenterol ; 9: 1752-5.

[22] Seyda ,T.: Derya ,C and Fósun A.(2007) .The relationship of *Helicobacter pylori* positivity with age, sex, and ABO/Rhesus blood groups in patients with gastrointestinal complaints in Turkey. *Helicobacter*; 12: 244-50.

[23] Salehi, M.; Ghasemian, A.; Shokouhi Mostafavi Vardanjani, H. (2017). Sero - prevalene of *Helicobacter pylori* Infection in Neyshabur,, S.K.; Najafi, S. And Rajabi Iran, Iranian Journal of Pathology;12(2): 183-188.

[24] Jaff, M.S. (2011). Relation between ABO blood groups and *Helicobacter pylori* infection in symptomatic patients. Clin. Exper. Gastroenterol. 4:221–226.

[25].Shaweno, D. and Daka, D. (2013). Association between O blood group and *Helicobacter pylori* infection: A systematic review and meta-analysis. J. public Health Epidemiol , vol 5(12) pp.471-478.

[26] Jafarzadeh, A: Ahmedi - Kahanali, J.: Bahrami , M. and Taghipour, Z. (2007).

Seroprevalence of anti-*Helicobacter pylori* and anti-CagA antibodies among healthy children according to age, sex,ABO blood groups and Rh status in southeast of Iran. *Turk* J Gastroenterol; 18: 165-71.

[27] Kanbay, M, Gór, Gk and Arslan, H.(2005). The relationship of ABO blood group, age, gender, smoking and *Helicobacter pylori* infection. *Dig Dis Sci*; 50: 1214-7.

[28] Gonzαles Flores, PA.: Dvaz Ferrer, JO and Monge Salgado E. (2000). ABO blood groups as risk factor in *Helicobacter pylori* infection. *Rev Gastroenterol Peru*; 20: 370-5.

[29] Abou-Taleb, A.; Ahmed A. and Mahmoud K. E. (2017). Association between *Helicobacter pylori* Infection and Iron Deficiency Anemia among School-Age Children in Sohag University Hospital, Upper Egypt. J. Blood Dis. 7:36-46.

[30] Xu C, Xiao L, Zou H.(2010) .Effect of birid triple viable on peptic ulcer patients with *Helicobacter pylori* infection. Zhong Nan Da Xue Xue Bao Yi Xue Ban; 35: 1000-4.

[31] Iodice S, Maisonneuve P, Botteri E, Sandri MT, Lowenfels AB.(2010). ABO blood group and cancer. European Journal of Cancer; 46(18):3345-50. https://doi.org/10.1016/ j.ejca.2010.08.009. PMID: 20833034.

[32] Linde NS, Nordman H, Hedenbro J, Hurting H, Bore NT, Carlsted I.(2002) Strain- and blood group-dependent binding of Helicobacter pylori to human gastric MUC5AC glycoforms. Gastroenterology; 123(6):1923-30. https://doi.org/10.1053/gast.2002.37076.

[33] Gaidaa KB, Amin Al-Suami, Saad SH.(2016). Relationship between ABO blood groups and Helicobacter pylori infection among patients with dyspepsia. Journal of Virology and Microbiology:1-9. https:// doi.org/10.5171/2016.688370.

الاصابة باللولبيات البوابية المشخصة بواسطة اختبارإستنشاق اليوريا وعلاقتها مع الجنس، مجاميع الدم والعامل الريسي

نادية محمود محمد[1] ، صباح محمد صالح[2]

[1]قسم علوم الحياة ، كلية التربية للعلوم الصرفة ، جامعة تكريت ، تكريت ، العراق

[2]كلية التمريض ، جامعة كركوك ، كركوك ، العراق

الملخص

الهدف من الدراسة هو معرفة الاصابة ببكتريا اللولبيات البوابية وعلاقتها مع الجنس، العمر، مجاميع الدم والعامل الريسي في مدينة كركوك للفترة من 2016/8/1ولغاية 2017/4/1 .من مجموع (176) مريضاً مصاباً بسوء الهضم تم تشخيص الاصابة ببكتريا اللولبيات البوابية في (120) مريضاً باستخدام اختبار استنشاق اليوريا المعلم بالكاربون المشع. تراوحت أعمار المرضى بين 15−74 سنة. لاتوجد فروقات معنوية بالنسبة للعمر في حين سجلت فروقات معنوية في الاصابة بين الاناث والذكور إذ بلغت (41,79)على التوالي. اعلى نسبة إصابة سجلت 86 مريضاً من مجموعة الدم O بنسبة (48.8%) ومجموعة A 42 بنسبة (23.86%)، ومجموعة B 41 بنسبة (23.29) واقل نسبة سجلت في المجموعة AB 7 بنسبة (3.97%) وجدت فروقات معنوية في الاصابة بين مجاميع الدم المختلفة في مجتمع كركوك ولاتوجد فروقات معنوية في الاصابة بالنسبة للعامل الريسي إذ بلغت نسبة العينات الموجبة (88.06%) والسالبة (11,93%).