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Relation between ABO Blood Group's and Helicobacter Pylori Infection in Patient's with Gastritis Symptom's Attending AL Amal Gabal Awlia Hospital Khartoum

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Abstract:-

Background and Objectives:
Blood group antigens were associated with gastritis, which is potentially caused by Helicobacter pylori. It was recently demonstrated that the receptor for H.pylori is the blood group antigen Lewis, which is exposed only in blood group O This study aimed to detect possible correlation between H.pylori Infection and ABO blood groups in patients with gastritis signs and symptoms.

Methods:
This was descriptive cross-sectional, study which carried out between July and October 2017 in which 90 patients suffering from gastritis symptoms attending to AL Amal Gabal Awlia Hospital were enrolled, blood specimen were collected blood group phenotype and Rhesus were determined by tube method. Ninety patient's sera underwent tested by ELISA for *H.pylori* (IgG-IgM) after examined for *H.pylori* by screening test (ICT). Ethical Clearance was obtained from Research Ethical Board-AL Neelain university data was collected using questionnaire and analyzed by SPSS.

Results:
Out of the Total Ninety patients with gastritis sign and symptom's, 27(30%) were males and 63(70%) were females their age ranged 14-69 year's, with mean(38.7).The total patients were positive for H.pylori 78 (86.6%), while 12 (13.3%) patient's negative. regarding gender female had high seropositivity (65.3%) . out of Total 66 positive of IgG and 12 both IgM ,IgG positive. and 12 both IgG ,IgM negative, regarding blood grouping, most of study population were group O with frequency 38(77.5%) ,14 (73.6%) blood group B, 11(16.6%) Blood group A and 3(4.5%) Blood group AB. This implies that there was statistically significant correlation between the O blood group, positive and H.pylori infection in gastritis disease patient. P.Value=0.023 and 0.038 respectively.

Conclusion:
This study revealed statistical a significant association between blood group O and *H. pylori* infection.

I. INTRODUCTION

Helicobacter pylori (*H. pylori*) are Gram-negative, micro-aerophilic, spiral, rod-shaped bacteria which are a major health problem worldwide [(1)].have been observed in the stomach of humans for over one hundred years, but it was not until Warren and Marshall,[(2).] isolated a campylobacter-like bacterium from patients with gastritis, that a relationship between gastric disease and a bacterium was realized[(3)] Gastritis, peptic ulcer disease, gastric carcinoma and mucosa associated lymphoid tissue (MALT) lymphoma are recognized complications of *H. pylori* infection[(4)]In Sudan, the prevalence of infection was estimated to be between 65.8% and 80%[(5)] *H. pylori* has several liopopolysaccharides such as O antigen on its outer membrane expressing Le^a and Le^b antigens. the lewis antigen expression on the membrane of *H.pylori* for antigenic mimicry may create persistent conlonisation and surviving of bacteria in the stomach mucosa. in addition[(6)] ,expression of Le^b antigen in gastric mucosa may play as receptor for bacteria adhesion .it seems blood group antigen b-binding adhesion (babA) on the outer membrane of *H.pylori* has major role in persistent colonisation of the bacteria with attachment to Le^b antigen of gastric mucosa[(7),(8)]binding of *H.pylori* to H and Le^b antigen in gastric mucosa probably describes higher incidence of chronic gastritis and gastric adenocarcinoma in O blood group phenotype and gastric adenocarcinoma in o blood group phenotype and secretors (expressing Le^b antigen.[(9),(10).]infection can be diagnosed in 90-100% of duodenal ulcer (DU) patients and in 60-100% of gastric ulcer (GU) patients [(11).]*H. pylori* isolates are divided into two types: type I strains of *H. pylori* contain a 40 kb segment on their chromosome, termed *cag PAI*, they produce functional Vac A toxin, and the infection by the strains is associated with more severe disease forms; type II strains of *H. pylori* do not contain *cag PAI*, do not produce Vac A toxin, and induce only a mild form of gastritis [(12).]The diagnosis of

H. pylori infection is obtained by either invasive (urease test, culture, histology) or non-invasive tests (serology, urea breath test) [13]. Epidemiological studies have demonstrated higher frequencies of the O blood group and the non secretor phenotype of ABH antigens among patients suffering from peptic ulcers. Since *Helicobacter pylori* has been established as the main etiological factor in this disease, controversies about the associations of the ABO and Lewis blood group phenotypes .the relation to susceptibility towards infection by this bacillus have been presented [14].Study conducted in Gezira, Sudan 2015 found two hundred (200) patients with various gastrointestinal symptoms attending endoscopy unit, Patients were diagnosed as having gastritis. concluded that O blood group and cDe Rhesus phenotype individuals are more susceptible to *H. pylori* infection and AB blood group individuals are less susceptible to *H. pylori* infection [15].Also studies conducted in Omdurman Teaching Hospital 2014 the concluded that Blood group O have higher susceptibility to *H. pylori* infection than other blood group but there was statistically insignificant[16]. This study was done to determine the possible correlation between *H. pylori* Infection, ABO and Rhesus (Rh) blood groups in Sudanese patients with gastritis.

II. MATERIALS AND METHOD :

This was descriptive- cross sectional study which had been conducted in Khartoum state during period from July and October 2017, ninety patients with *H. Pylori* infections sign & symptoms (Nausea ,Vomiting , Burning ache, Fullness after eating) were included Data was collected by using direct interviewing questionnaire; verbal consent was obtained from all patients. Ethical clearance was obtained from the Research Ethical Committee of AL-Neelain University, before the start of the study.

III. EXPERIMENTAL WORK

A. Sampling

Blood samples were collected from ninety(90)patient, under direct medical supervision by medial vein puncture using 5 ml syringe into EDTA & plain tube to obtain serum by centrifugation at 5000 rpm for 10 min. serums was kept in -20°C till serological study was performed .Specimens were processed by ICT OF *H.pylori (*From ABON rapid test detection of Ab in human serum or plasma, china) and Enzyme linked immune sorbent assay (ELISA) (from EUROIMMUN labor diagnosis Gmbh ,Germany) for detection of *H.pylori* IgM and IgG.

B. Blood Group Reagents

Blood grouping reagent: Anti-A and Anti-B and Anti-D (forward cells ,Crescent Diagnostics ,Jeddah. Saudi Arabia) 3-5% Suspension of red blood cells was prepared to be tested in isotonic saline (washed or un washed cells may be use) one drop of Anti- A and Anti B and Anti-D respectively, in three small ,properly labeled test tubes were add one drop of RBC suspension into the tubes and mixed, the test were centrifuge tubes for appropriate centrifuge time were completely resuspend cells and examined macroscopically for agglutination grade and record results .

C. ICT for Detection of H.pylori (Rapid test)

Serum specimen were and control to allowed reach room temperature (15-30^{0}c) prior to testing. the pouch was brought room temperature before opening, the test device was removed from the scaled pound and used soon as possible. the dropper was hold vertically were transfer 3drops of serum(approx.100ul) to the specimen well of the test device, the time was started Avoid trapping air bubbles in the specimen well, Waiting for the colored line to appear . results were read at 10 min. interpreted as Positive when two distinct colored lines appear one line in the control region and another line in the test region. Negative one colored line appear in the control region .

D. Enzyme Linked Immune Sorbent Assay for Detection H.Pylori IgM and IgG (The Same Method For Both)

- *Reagent Preparation*

All reagent and samples were brought to room temperature (18-30C^0) . The strips were set in strips were set in strip-holder. The wells were numbered including two negative controls , two positive controls and two cut-off control.

- *Dilution of the Sample*

sample were diluted 1:101 e.g.: 10 ul +1 ml of sample diluted

- *Pipetting and Incubation Steps*

100 ul of negative control, positive control and diluted sample were add to their well respectively and 100 ul of sample diluted added into blank. the wells were incubated at room temperature (21-25 ^{0}c) for 30 minutes, protected from intense light. the wells were washed four times with automatic washer with diluted wash buffer.100 ul of peroxidise conjugate were added to each well. the wells were incubated for 30 minutes at room temperature (21-25 ^{0}c) protected from intense light. washing was repeated as above and 100 ul of TMB substrate were added to each well. wells were incubated for 15 minutes in room temperature (21-25 ^{0}c) in the dark, after incubation the colour change to blue in the positive control and positive samples well.100 ul of stop solution were added into each well, and mixed gently. intensive yellow colour developed in positive control and positive sample wells.

- *Measuring the Absorbance*

the plate reader was calibrated from the absorbance which was read at 450nm, the cut-off value was calculated and the result were evaluated(the absorbance was read within 10 minutes after stopping the reaction).

- *Calculation of the Result*

the cut - off was calculated from the absorbance of the negative control and the absorbance of cut-off control and defines the cut-off rang. extinction of the control or patient sample/extinction of calibrator 2 =Ratio

- *Intepretatation of Sample Result*

Ratio < 0.8 : positive
Ratio ≥ 0.8 to < 1.1 : borderline
Ratio ≥ 1.1 : positive

- *Data Analysis*

Data was analyzed by SPSS (Statistical Package of Social Science) software program version16

IV. RESULTS

Out of the Total Ninety patients with gastritis sign and symptom's, 27(30%) were male's and 63(70%) were female's their age ranged 14-69 year's, with mean(38.7).The total patients were positive for *H.pylori* 78 (86.6%), while 12 (13.3%)of patient's were negative. regarding gender female had high seropositivity (65.3%) . out of Total 66 positive of IgG and 12 both IgM ,IgG positive. and 12 both IgG ,IgM negative, was observed group O with frequency among 38(77.5%) ,14 (73.6%) blood group B, 11(16.6%) Blood group A, 3(4.5%) Blood group AB. (Table.1)highest seropositivity to *H.pylori* was observed among Group O blood group (57.5%) there was statistically significant correlation between the O blood group, positive and *H.pylori* infection in gastritis disease patient. P.Value =0.023 and 0.038 respectively.

Blood group	H.pylori IgG Positive	H.pylori IgM positive	H.pylori Both IgG & IgM Positive	H.pylori Both IgG & IgM Negative	Total
Group B	14 (21.2%)	0	4 (33.3%)	1 (8.3%)	19
Group O	38 (57.5%)	0	5 (41.6%)	6 (50%)	49
Group A	11 (16.6%)	0	3 (25%)	3 (25%)	17
Group AB	3 (4.5%)	0	0	2 (16%)	5
Total	66 (73.3%)	0	12 (13.3%)	12 (13.3%)	90 (100%)

P.Value= 0.023 and 0.038

Table 1.Relation between IgG, IgM and *H.pylori* Sero Frequency:

V. DISCUSSION

Helicobacter pylori(H.pylori) pathogen is an organism that cause a major health problem worldwide. More than half of the world populations are infected with this pathogen.[17] This study carried out to detect IgG& IgM antibody of *H.pylori* and ABO Blood Group by among patients with Gastritis signs & symptoms we observe increase of *H.pylori* infection with age,14 to 69 years and then decrease after 69 years . The results of this study showed to a fair extent an association between the O blood group and *H. pylori* infection a finding which is supported by other studies [18,19].The distribution of ABO blood group phenotypes frequencies among the patients in this study The blood group 'O' (57.7%) was predominantly occurring type followed by group 'B' (21.2%), group A (16.6%) and the lowest proportion is noticed in AB blood group (4.5%). Blood group A and B patients in this study were less prone to *H.pylori* infection Individuals with blood group AB were shown to be less prone to *H. pylori* infection in a different be less prone in a different study [20].The lower rate of infection in the present study may be due to improvement in standard of living. The prevalence of infection was low as compared to the neighboring countries such as Uganda (87%), Ethiopia (89%) and Libya (94%)[21,22,23], which might be explained by the difference in socioeconomic status, being higher among groups with lower socioeconomic status[24] .comparing to the study conducted in Sudan between *H. Pylori* and ABO blood groups system in March to July 2014 the result was The frequencies of this study showed the blood group O (46%) followed by group B (29%), group A (23%) and the lowest proportion is noticed in AB blood group .Their result's showed there an association between ABO blood group and *H. pylori* infection. The results showed variation in infection with *H. pylori* according to gender that found females more prone to infection than males (55% respectively 45%).Our study is agreed with previous studies done in Vishwakarma population of Mysore district in Karnataka is showed the blood group 'O' (37.76%) is predominantly occurring type and the lowest proportion is noticed in AB blood group (11.89%). But, disagree with some previous studies which demonstrated that the O blood group did not represent a risk factor for *H. pylori* infection[25].

VI. CONCLUSION

This study revealed statistical a significant association between blood group O and *H. pylori* infection ..... studies may be conducted to validate this result .

VII. ACKNOWLEDGMENT

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