



Helicobacter Pylori among Iraqi Patients with Central Serous Chorioretinopathy



Alyaa Abood Kareem^{1*}, Giyathaldeen TH Neamah², Mohammed Abed Abdulhussein¹ and Zaid Ayed Kareem¹

University of Kufa, Faculty of medicine, Iraq

Jabir Ibn Hayyan Medical University, Iraq

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*Corresponding author: Alyaa Abood Kareem, University of Kufa, Faculty of medicine, Iraq

Abstract

Purpose: To determine the prevalence of *Helicobacter pylori* among patients with Central serous chorioretinopathy and effect of its eradication on signs and symptoms of the disease.

Patients and methods: This is a case control study which was conducted at Ibn-Al Haitham Teaching Eye Hospital during the period from July 2017 to June 2018 Eighty-eight Participants (20-59 years of age) were divided into two groups: Group (A) 38 patients diagnosed to have Central serous chorioretinopathy on basis of clinical ophthalmological examination and macular optical coherence tomography. In addition, group (B) including 50 healthy control subjects with normal ophthalmological examination. All participants were sent for urea breath test to detect *Helicobacter pylori*, those with positive results were referred for eradication of *Helicobacter pylori*, and reassessment was done at 4-6 weeks for all subjects with Central serous chorioretinopathy

Result: The prevalence of *Helicobacter pylori* among patient's in-group (A) was (68.4%) while in-group (B) was (42%). The majority of those patients' in-group (A) (92%) showed symptomatic response to eradication of *Helicobacter pylori* infection and only (7.7%) did not respond.

Conclusion: *Helicobacter pylori* could be a risk factor for Central serous chorioretinopathy and successful eradication of *Helicobacter pylori* can improve the common signs and symptoms of Central serous chorioretinopathy.

Keywords: CSCR, *H. pylori*; Central serous chorioretinopathy; Infection

Introduction

Central serous chorioretinopathy (CSCR) was first describe by Von Graefe in 1886 [1]. it is an idiopathic disorder characterized by localized serous detachment of sensory retina at macula secondary to leakage from the choriocapillary through one or more hyperpermeable retinal pigmented epithelium (RPE) sites [2]. It commonly affects young men (between 25-45) years old, unilateral in (80-90%) patient usually complain of blurred vision, central positive scotoma, micropsia, metamorphopsia, and impaired color vision [3,4]. the disease has spontaneous resolution with good visual prognosis, but recurrence occur in 50% or more of cases, Small percentage of cases may develop chronic course [5].

Pathophysiology of CSCR is poorly understood. Possible theories include choroidal hyperpermeability due to ischemia, stasis or inflammation, which overcome the RPE pumping mechanism responsible for keeping the subretinal space dry

[6,7]. RPE dysfunction is another theory for developing CSCR in which focal damage of adjacent RPE cells or even a single RPE cell leads to reversal of ion pumping mechanism and resulting in fluid accumulation in the subretinal space [8]. An alternative theory is a combined choroidal and RPE dysfunction. [9] Several risk factors associated with CSCR such as steroid administration stress, personality type A, sildenafil

Obstructive sleep apnea, systemic hypertension, Cushing disease, pregnancy, *H. pylori* and systemic lupus erythematosus [5].

There is no effective treatment of CSCR; most of cases resolve spontaneously within 1-6 months, Micro pulse diode laser to the site of leakage has shown good response, PDT 30-50% of the dose with 50% light intensity leads to complete resolution. AntiVEGF may show some promise. Other treatment including aspirin, mifepristone and eplerenone [2].

Helicobacter pylori (*H. pylori*) is one of most common causes of gastrointestinal infection worldwide. It is gram negative, spiral shape, flagellated bacteria, associated with many digestive and extra digestive pathogens for human. The digestive diseases include gastritis, duodenal ulcer gastroesophageal reflex, gastric cancer, anorexia. The extra digestive disease includes atherosclerosis, cardiovascular disease, Parkinson disease, autoimmune thyroiditis, urticaria, rosacea, and (eye diseases) including glaucoma, blepharitis, sjogren disease, uveitis and CSCR [10-13]. There are invasive and noninvasive technique to diagnose the *H. pylori*, the invasive requiring endoscopy and biopsy for histological examination and culture. The non-invasive include urea breathe test (which is the most sensitive and specific test), serum antibodies to *H. pylori*, stool antigen [14].

Recently, the relation between *H. pylori* and central serous Chorioretinopathy has been documented, it's thought that antibodies Against *H. pylori* antigen cross- react with vascular wall antigens lead to damage of arterial cell wall and development of atherosclerosis and microangiopathy [15]. The clinical application of this relation is yet to be emphasized and the role of its eradication is better to be included in the Symptomatic management of CSCR.

Aim of the Study

To evaluate the relationship between CSCR and *H. pylori*, and the effect of *H. pylori* eradication on course of CSCR.

Patients and Methods

This is a case control study that was conducted at Ibn-Alhaitham Teaching eye Hospital from July 2017 to June 2018 where 88 participants are included in this study divided into two groups: Group (A) which included Thirty-eight patients recently diagnosed with CSCR and Group B (50) Subjects with normal ophthalmological examination considered as control group. All individuals underwent a full medical history and ophthalmological history and examination including (best corrected visual acuity by Snellen chart, Amsler grid, slit lamp biomicroscopic examination dilated fundus examination by non-contact 90D double aspheric

condensing lens. Suspected patients with CSCR were examined by optical coherent tomography (OCT) to confirm the diagnosis of CSCR. All participants were sent for urea breath test to detect *H. pylori* infection, the patients with positive urea breath test were referred for medical consultation for eradication of *H. pylori* infection and follow up after 4-6 weeks for ophthalmological symptoms (blurred vision, micropsia, metamorphopsia, and scotoma) and signs (sub retinal fluid) by repeat the OCT and microbial laboratory re-examination (urea breath test). A verbal informed consent was obtained from all patients before urea breath test and before starting the treatment (Use of topical and systemic steroid, Smoking, pregnancy, renal failure, hypertension, SLE, diabetic retinopathy, sildenafil) were excluded

Statistical analysis

SPSS® Software (version 23.0 for Linux®) was used to perform statistical analysis. Qualitative data are presented as numbers and percentages, and continuous numerical data are presented as mean ± standard deviation. Comparison of study groups was carried out using chi- square test for categorical data and using Student's t-test for continuous data. P value of < 0.05 was considered statistically significant.

Results

This study included 88 participants: 38 patients diagnosed with central serous chorioretinopathy (CSCR) and 50 healthy controls, all underwent urea breath test for detection of presence of *H. pylori*. Males comprised 89.5% of the group (A) while females comprised 10.5%; compared to 78.0% males and 22.0% females in the group (B). Age characteristics of the study groups are described in (Table 1). No statistically significant difference was found regarding the age across males & females, a represent that age of patients group is comparable between the two genders. Age group distribution for cases group is summarized in (Figure 1), while age group distribution for control group is summarized in (Figure 2). The right eye examined involved 57.9% of the patients while the remaining 42.1% patients had their left eye examined (Figure 3).

Table 1: Age characteristics of the study groups.

Group	Age (Years)		P-value
	Mean ± SD	Range	
Cases (n=38)	37.7 ± 8.1	20 - 57	0.633
Controls (n=50)	36.9 ± 7.5	22 - 56	
Total (n=88)	37.2 ± 7.7	20 - 57	

Prevalence of *H. pylori* in cases group as indicated by the results of urea breath test is found to be 68.4%, with a total positive results of 26 out of 38 (Figure 4), while the prevalence in control group was 42.0%, with a total positive results of 21 out of 50 controls (Figure 5). Status of *H. pylori* infection by gender in

cases group is summarized in (Table 2). No statistically significant difference has been found regarding *H. pylori* infection across gender. Table 3 compares status of *H. pylori* infection across gender in controls group.

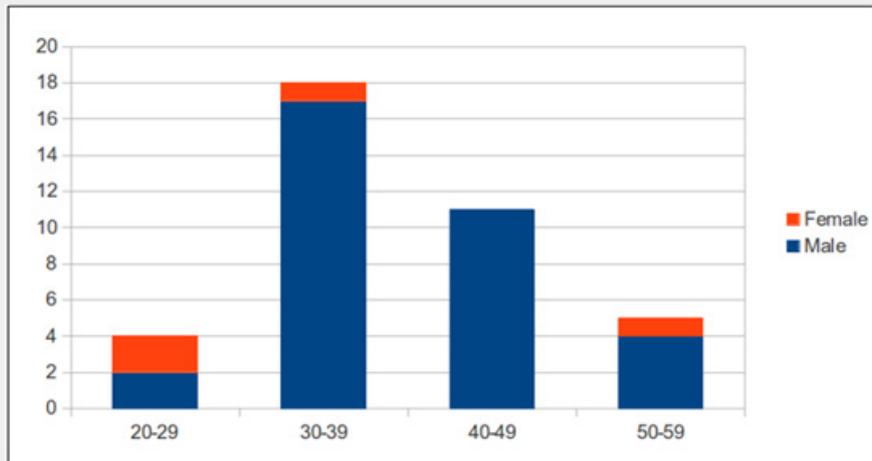


Figure 1: Age group distribution by gender in cases group.

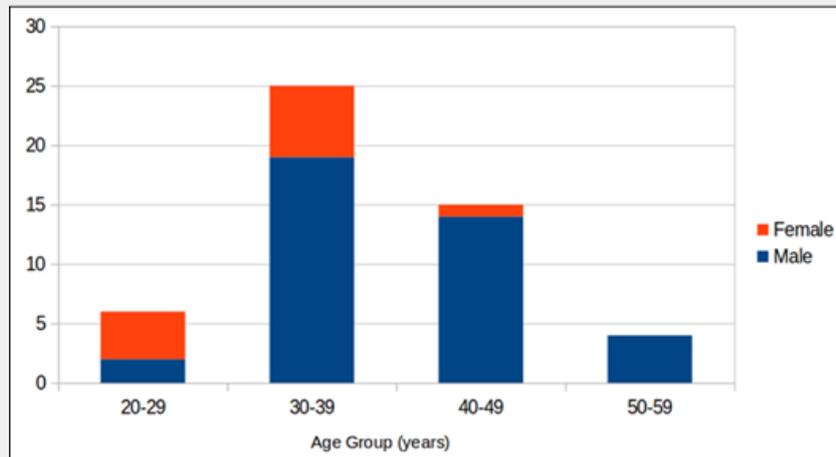


Figure 2: Age group distribution by gender in control group.

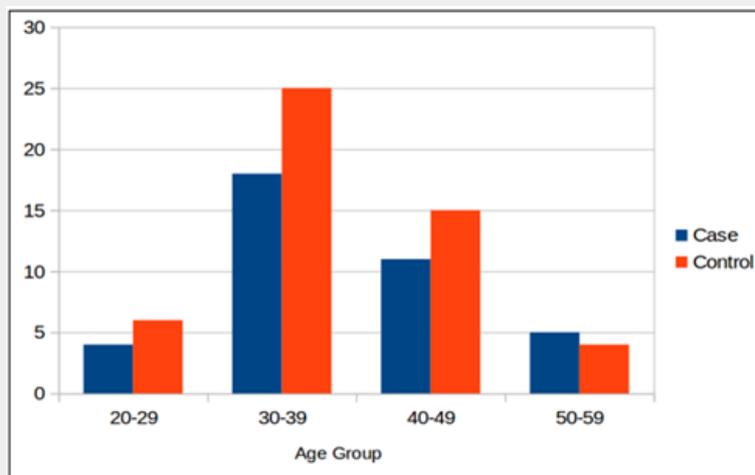


Figure 3: Age group distribution among study groups.

Table 2: *H. pylori* status by urea breath test compared to gender in cases group.

Urea Breath Test	Male	Female	Total
Positive	24 (70.6%)	2 (50.0%)	26 (68.4%)
Negative	10 (29.4%)	2 (50%)	12 (31.6%)
Fisher's Exact Test = 0.07, d.f. = 1, P-value = 0.788			38 (100%)

Table 3: *H. pylori* status by urea breath test compared to gender in control group.

Urea Breath Test	Male	Female	Total
Positive	21 (53.9%)	-	21 (42.0%)
Negative	18 (46.2%)	11 (100%)	29 (58.0%)
Fisher's Exact Test = 8.12, d.f. = 1, P-value = 0.004			50 (100%)

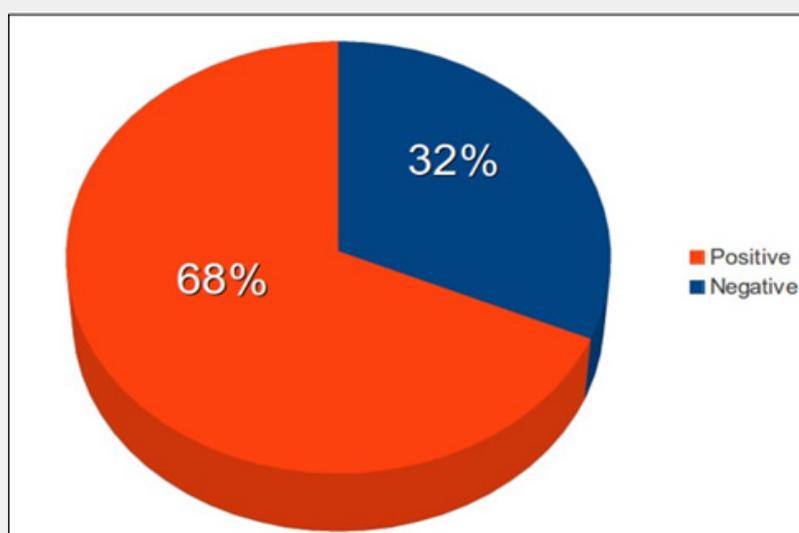


Figure 4: Results of urea breathe test among cases group, representing *H. pylori* prevalence in CSCR patients.

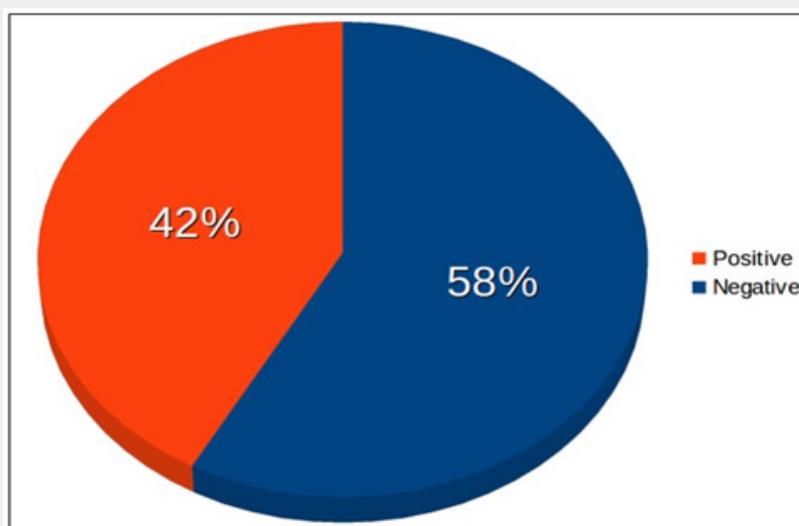


Figure 5: Results of urea breathe test among control group.

Comparison between cases and controls have demonstrated that there is a statistically significant difference between the two groups regarding *H. pylori* status, P-value=0.014 (Table 4). Odds ratio was 2.99 with 95% confidence interval of (1.23-7.25). Comparison of different age groups in the cases group regarding *H.*

pylori status is summarized in (Table 5). No significant difference was found between the different age groups in cases group. A similar comparison was performed for control group, similarly no significant difference was observed between the different age groups of the controls (Table 6).

Table 4: *H. pylori* status by urea breath test compared to study group.

Urea Breath Test	Cases (n=38)	Controls (n=50)	Total
Positive	26 (68.4%)	21 (42.0%)	47 (53.4%)
Negative	12 (31.6%)	29 (58.0%)	41 (46.59%)
Total 38 (100%) 50 (100%)			88 (100%)
$\chi^2 = 6.06, d.f. = 1, P\text{-value} = 0.014$			

Table 5: *H. pylori* status compared to different age groups in cases group.

Age Group (years)	Urea Breath Test		Total
	Positive	Negative	
20 - 29	3 (11.5%)	1 (8.3%)	4 (15.5%)
30 - 39	12 (46.2%)	6 (50.0%)	18 (47.4%)
40 - 49 6 (23.1%) 5 (41.7%) 11 (29.0%)			
50 - 59	5 (19.2%)	-	5 (13.2%)
Total	26 (100%)	12 (100%)	38 (100%)
$\chi^2 = 3.39, d.f. = 3, P\text{-value} = 0.335$			

Table 6: *H. pylori* status compared to different age groups in control group.

Age Group (years)	Urea Breath Test		Total
	Positive	Negative	
20 - 29	2 (9.5%)	4 (13.8%)	6 (12.0%)
30 - 39	10 (47.6%)	15 (51.7%)	25 (50.0%)
40 - 49	6 (28.6%)	9 (31.0%)	15 (30.0%)
50 - 59	3 (14.3%)	1 (3.5%)	4 (8.0%)
Total	21 (100%)	29 (100%)	50 (100%)
$\chi^2 = 2.04, d.f. = 3, P\text{-value} = 0.564$			

Patients who tested positive for urea breath test have undergone eradication of *H. pylori*, then CSCR condition was re-assessed clinically and by OCT. The majority (92.3%) of those

patients have shown improvement in the symptoms of the disease and decrease in sub retinal fluid while the remainder (7.7%) has shown no improvement (Figure 6).

Discussion

In view of the list of risk factors for the development of CSCR, ideas of targeting or controlling extraocular possible causes for the problem are to be thought of. *H. pylori* infection of the digestive system has been pointed as a risk for CSCR, but its eradication is not a fixed protocol in the disease management. This study utilized Iraqi patients recently diagnosed to have CSCR to determine the prevalence of *H. pylori* in the upper digestive system depending of the urea breath test. It was found that (68.4%) of CSCR, patients had these bacteria; compared to the 42% positive results in the control group the finding was statistically significant.

This agree with a study conducted in Spain by Asensio-sanchez et al. [16] who observed that 68.75 % of patient with CSCR infected with *H. pylori* comparing to with 30 % of control. Similarly, In Iran, Fegghi et al. [17] found 68.5% of patient with CSCR have *H. pylori* positive, which was higher than the rate of control people. And Roshani et al. [18] reported a much higher prevalence of *H. pylori* in patients with CSCR than in control group. Another study conducted in Poland by Misiuk Hojlo, et al. [19] reported that *H. pylori* detected in 67.0% of total patients with CSCR comparing with 47.0% of control. An Italian study by Cotticelli et al found 78.2% of patients with CSCR have *H. pylori* positive while control group reported only 43.5% [20]. Another study have been done in France on patients with chronic CSCR by Mauget-Faysse et al. [21] they found (56.3%) of patient were *H. pylori* positive comparing with general French population 27.5%. While a study done in New York – USA by Warrow et al. [22] showed lower prevalence of *H. pylori* infection in patient with CSCR.

After successful medical eradication of *H. pylori* as proven by repeating the urea breath test, the CSCR patients VA, symptoms like (micropsia, metamorphopsia were improved and decrease of sub retinal fluid was noted. the same was seen in study done in France by Abnoux- Zabsonre which reported that improvement of the symptoms and signs was associated with complete eradication of *H. pylori* [23]. Roshani et al. [18] note that the symptoms of patients with CSCR get better after successful eradication of *H. pylori*. Also, Casella et al. [24] reported eradication of *H. pylori* could improve the V.A of patient with CSCR. Rahbani- Nobar et al. [25] found the reabsorption time of SRF in *H. pylori* eradication group a much shorter compare with the control Group but Dang et al found in his study *H. pylori* eradication neither improve the VA nor decrease sub retinal fluid [5].

The exact relation between *H. pylori* and CSCR is not fully understood It has been suggested that *H. Pylori* cytotoxin associated gene A (cag A) Increase the risk of atherosclerosis because anti-cag A antibody cross React with vascular cell wall antigen stimulating immunological reactions that cause damage of the arterial cell wall and development of Atherosclerosis [17,26]. In addition, IgG response to *H. pylori* infection act as another risk factor for endothelial dysfunction that may induce ischemia [27]

these mechanisms might be part of pathophysiology of CSCR and explain the relation between *H. pylori* and vascular endothelial disorders like CSCR and coronary artery disease [28]. Age and sex showed no significant effect on the prevalence of *H. pylori* infection among patients with CSCR or the control group except in the sex.

Conclusion and Recommendations

Conclusion

H. pylori infection is risk factors for CSCR and eradication of these bacteria could be beneficial for improvement of signs and symptoms.

Recommendations

- a) Larger sample study.
- b) Study unilateral VS bilateral cases and chronic VS acute or recurrent cases in relation to the association with *H. pylori* may uncover further facts about the association.

For management of patients with CSCR a vital step to be considered is looking for the possible association of *H. pylori* infection and proper medical eradication in cooperation with the physician is encouraged to speed up the recovery.

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