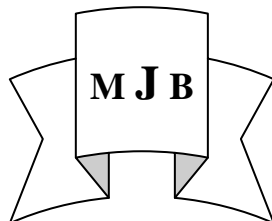


## Prevalence of Seropositive Anti-helicobacter Pylori Antibody in Patients with Coronary Artery Disease in Al-Najaf City

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### Abstract

**Background:** Helicobacter pylori (H.pylori), a bacterium involved in duodenal and gastric ulcers, gastric cancer, and MALT lymphoma pathogenesis, may causes numerous extragastric manifestations, including coronary artery disease.

**Objective:** To determine the prevalence of positive antiH.pylori antibody in patients with coronary heart disease.

**Patients and Methods** 80 patients with coronary artery diseases were engaged in this study. Patients with gastrointestinal problems or seemed to have symptoms & signs of peptic ulcer diseases were excluded from this study. All 80 patients were involved in a well –planned questionnaire including history of coronary artery diseases , history of systemic hypertension , diabetes mellitus, smoking , age , family history of CAD ,and hyperlipidemia. Blood samples were taken from all the patients and sent for a commercial rapid test of a latest generation of chromatographic immunoassay which utilize recombinant Cag-A antigens to detect the antibodies to H. pylori in human serum. Also the patients' blood samples were sent for random plasma glucose & lipid profile.

**Results:** Among 80 patients enrolled in this study ,43(53.75%) males and 37 (46.25%) females with variable age groups. Fifty percentage of all patients had acute attacks of CAD and the other half had chronic CAD ( identified by either by a new ischemic attack or during routine checkup). Testing for Anti H.pylori antibody in serum revealed that 31 (38.75%) of all patients had positive anti H.pylori antibody , while 49 (61.25%) had not. Sex variation among those with positive antiH.pylori showed no significant differences ( 15 males vs. 16 females). Strong association had been elicited between the occurrence of anti H. pylori antibody positivity and the presence of smoking and Hypertension as risk factors for CAD. 5/31 (16.12%) of the positive antiHP antibody CAD patients had completely negative risk factor for CAD that made HP infection is significant & important trigger factor for CAD.

**Conclusions:** There is a significant association between infection with and positive antiH.pylori antibody and the causation of coronary artery diseases which is more common in smoker& hypertensive patients. HP infection is important trigger factor for CAD.

## انتشار الأجسام المصلية الموجبة المضادة لجرثومة ال HP لدى مرضى أمراض الشرايين التاجية

### الخلاصة

**الخلفية:** HP، البكتيريا التي تدخل ضمن مسببات قرحة الأثني عشري، قرحة المعدة، سرطان المعدة، و لمفوما خلايا تي للمفاوية المرتبطة ببطانة المعى، يمكن أن تتسبب بعدة أمراض خارج الجهاز الهضمي مثل أمراض الشرايين التاجية.

**الغرض من الدراسة:** لمعرفة مدى انتشار الأجسام المضادة الموجبة لجرثومة HP لدى المرضى المصابين بأمراض الشرايين التاجية.

**طريقة العمل:** (٨٠) مريض لديهم أمراض الشرايين التاجية (ذبحة صدرية غير مستقرة، احتشاء العضلة القلبية مع ارتفاع جزء أسد تي) تم إدخالهم بهذه الدراسة. المرضى الذين يعانون من مشاكل في القناة الهضمية أو يشتبه بامتلاكهم أعراض وعلامات القرحة المعوية تم استبعادهم من هذه الدراسة. جميع المرضى (٨٠) تم إدخالهم بأستبيان منظم يشمل التاريخ المرضي لأمراض الشرايين التاجية، داء السكري، ارتفاع ضغط الدم الشرياني، التدخين، العمر، الجنس. عينات من دم جميع المرضى تم إرسالها لعمل فحص تجاري معتمد لقراءة كروماتوكرافيقية يستخدم فيها مسببات معدلة نوع **Cag A** لغرض الكشف عن الأجسام المضادة لجرثومة ال HP في مصل المرضى. أيضا" عينات من دم المرضى تم إرسالها لقياس سكر الدم ومستوى الدهون.

**الأستنتاجات:** ضمن ال (٨٠) مريض المشمولين بهذه الدراسة، ٤٣ (٥٣،٧٥%) ذكور و ٣٧ (٤٦،٢٥%) أنث من فئات عمرية مختلفة. نصف هؤلاء المرضى يعانون من نوبات حادة من أمراض الشرايين التاجية والنصف الآخر يعاني من أمراض الشرايين التاجية المزمنة (تم الأستدلال بهم أما بنوية قلبية جديدة أو خلال الفحص الدوري). فحص الأجسام المضادة لجرثومة ال HP كشف بأن ٣١ (٣٨،٧٥%) يمتلكون نتائج موجبة للأجسام المضادة، بينما ٤٩ (٦١،٢٥%) يمتلكون نتائج سالبة. أختلاف الجنس لدى مرضى النتائج الموجبة أظهر تباين غير ذي قيمة (١٥ ذكور، ١٦ أنث). صلة وثيقة تم الأستدلال أليها بين حدوث أيجابية الأجسام المضادة لجرثومة ال HP ووجود التدخين وارتفاع ضغط الدم الشرياني كعوامل خطورة شلأمراض الشرايين التاجية. ٣١/٥ (١٦،١٢%) من الرضى الذين يمتلكون أجسام موجبة ل HP لايمتلكون أي عوامل خطورة للأمراض الشرايين التاجية والذي بدوره يبين أن الأصابة بجرثومة ال HP يشكل عامل محفز مهم وقيم للأصابة بأمراض الشرايين التاجية.

**الأستنتاجات:** هنالك علاقة وثيقة بين الأصابة ب و ايجابية الأجسام المضادة لجرثومة ال HP وحدث أمراض الشرايين التاجية الأكثر شيوعا" لدى المدخنين ومرضى ارتفاع ضغط الدم الشرياني.

### Introduction

**H**elicobacter pylori (H.pylori) is a slow-growing spiral Gram-negative flagellate urease-producing bacterium which plays a major role in gastritis and peptic ulcer diseases. Its complete genomic sequence is known. It is protected from gastric acid by the juxtamucosal mucous layer which traps bicarbonate secreted by antral cells. The prevalence of H.pylori is high in developing countries (80-90% of the populations) and much lower (20-50%) in developed countries. The incidence increases with age, probably due to acquisition in childhood when hygiene was poor and not due to infection in adult life. Infecting strain expresses CagA (cytotoxin-associated protein) and VacA (vacuolating toxin) genes. CagA is a marker for a section of a

bacterial DNA that contains gene responsible for a secretion system[1]. Infection with H.pylori and genetic alteration may contribute to the initial endothelial "injury" or dysfunction of the coronary arteries, which is believed to trigger atherogenesis [2]. Gastric mucosal damage caused by HP involves various bacterial and host-dependent toxic substances that have been recently associated with an increased risk of (CAD).HP infection induces platelet activation and aggregation that could be pathogenic explanation of association between HP infection and CAD [3]. Also There is a potentially important association with cerebrovascular disease. The strength of association is reduced if confounding factors are taken into account [4]. The classical risk factors for coronary disease may present in the

patient with myocardial infarction irrespective of H.pylori status [5]. Nonendoscopic tests for detection of H.pylori infection include antibody test (serum) with sensitivity of 88-94% and specificity of 74-88% and it is inexpensive [6].

**Patients and Methods**

In this prospective study, 80 patients with coronary artery diseases(CAD) in the two more common clinical forms (unstable angina UA, ST –segment elevation myocardial infarction STEMI) attending the Emergency room ,coronary care units (CCU) ,and consultation clinics) of AL-SADAR Teaching Hospital at AlNajaf city from October 2012 to June 2013, were engaged into this study to determine the prevalence of positive antiH.pylori antibody in their bloods. All patients entered a well –planned questionnaire including history of hypertension, diabetes mellitus, smoking, hyperlipidemia, and coronary artery diseases. All 80 patients must had:

\*Negative history of peptic ulcer diseases (gastritis,duodenal ulcer ,and gastric ulcer).

\*Negative long –term use of proton-pump inhibitors, antacids ,or NSAIDS)

Blood samples were obtained from all 80 patients and sent for lipid profile , blood sugar ,and rapid tests of chromatographic immunoassays which utilize recombinant CagA antigen to detect the antibodies to H.pylori.ECG were done for all patients to identify the onset ( acute or chronic), the sites (anterior ,inferior ,lateral) , and forms (UA ,or STEMI) of coronary artery diseases.Blood pressure was checked in all patients.The data & results were analysed and tables had been got regarding classification of patients according many variables including the prevalence of positive antiH.pylori antibody according to age, sex, onset, and other risk factors for coronary artery diseases.

**Results**

80 patients entered this study, 43 (57.75%) males and 37 (42.25%) females and classified to age group (30 - ≥70) years , to onset of coronary artery disease 40 (50% acute CAD) and 40(50% chronic CAD).Testing all 80 patients blood for AntiH.pylori AB showed that only 31(38.75%) had positive results ,while 49 (61.25%) had negative tests.Analysis of those patients with positive tests revealed the followings:

**Table 1** The positive antiH.pylori antibody in CAD according to sex group.

Sex	+ve antiHP antibody	-ve antiHP antibody	Total
Male	15	28	43
Female	16	21	37

As shown above, there is no significant difference in positivity of the test regarding the gender.

**Table 2** The age group variation with positive antiH.pylori antibody

Age(yrs.)	+ve antiHP antibody	-ve antiHP antibody
30-39	0	2
40-49	4	6
50-59	7	25
60-69	17	4
≥70	3	12
<b>Total</b>	<b>31</b>	<b>49</b>

As shown above ,about half (54.8%) of patients with positive results was within sixth decade of life.

**Table 3** The frequency of positive antiH.pylori antibody among the variant forms of coronary artery diseases.

Type of CAD	+ve antiHP antibody
<b>Unstable Angina (UA)</b>	<b>23</b>
<b>Anterior wall UA</b>	<b>1</b>
<b>Inferior wall UA</b>	<b>9</b>
<b>Lateral wall UA</b>	<b>13</b>
<b>ST-segment elevation myocardial infarction (STEMI)</b>	<b>8</b>
<b>Anterior wall STEMI</b>	<b>4</b>
<b>Inferior wall STEMI</b>	<b>4</b>
<b>Lateral wall STEMI</b>	<b>0</b>

The results above revealed that positive antiHP antibody more common in patients with unstable

angina UA ( 74.19%) than in patients with STEMI (22.81%).

**Table 4** The association between positive antiHP antibody and other risk factors for coronary artery diseases

Risk factors	Number of patients with +ve antiHP antibody
<b>Diabetes mellitus (DM) alone</b>	<b>1</b>
<b>DM+Hypertension (HPT)</b>	<b>4</b>
<b>DM+Smoking</b>	<b>3</b>
<b>(HPT) alone</b>	<b>5</b>
<b>HPT+Smoking</b>	<b>10</b>
<b>Hyperlipidemia alone</b>	<b>1</b>
<b>Smoking alone</b>	<b>1</b>
<b>Hyperlipidemia +Smoking</b>	<b>1</b>
<b>-ve medical history</b>	<b>5</b>
<b>Total</b>	<b>31</b>

The above results revealed that hypertension with smoking were the most common associated risk factors for CAD in positive antiHP cases. On the other hand, Those patients with completely negative history of risk factors compromised about 5 (16.12%) of positive cases which is a significant percentage that made infection with HP plays a role in pathogenesis of CAD.

### **Discussion**

AntiHP and type of CAD: in our study, patients with unstable angina with positive antiHP was 74.19% of the positive cases while STEMI about 25.81%. This result was different from a study was conducted by Jafarzadeh A and Esmaeeli-Nadimi A that revealed antiHP positivity was 86.7% in STEMI & 91.7% in Unstable angina [7].

AntiHP and CAD risk factors: we found that hypertension with smoking were the most common risk factors in positive antiHP CAD patients (10/31) cases, while a study made by Andreica V&Sandica-Andreica B showed that serum prevalence of antiHP was higher among smokers and alcoholic[8]. These results could be explained by social and religious habits in our society.

In our study , seropositivity to HP was found in 31/80 (38.75%) of the CAD. This finding is a little bit near what was detected by Pieniazek P&Karczewska E (47.3%)[3]. While studies investigating the specific molecular mimicry mechanisms induced by Helicobacter pylori strongly supported the association between H. pylori infection and ischemic heart disease, none of the studies performed so far did take into account the effect of the genetic susceptibility to develop ischemic heart disease or respond to H. pylori infection [9].

Finally, a significant & important finding detected in our study showed

that positive antiHP in CAD patients without any risk factors was 5/31 (16.12%) which suggests that HP infection may play a role as a trigger factor in CAD as Aceti A&Are R identified [10].

### **Conclusions**

\*The prevalence of positive antiHP antibodies were higher in patients with unstable angina than patients with STEMI.

\*There is no gender variation in prevalence of positive anti HP CAD patients.

\*Hypertension& smoking were the most common risk factors for CAD in positive antiHP patients.

\*HP infection occurred in 16% of CAD with -ve risk factors which may make it a trigger factor for CAD

### **References**

1. Parveen Kumar and Michael Clark, Kumar and Clark clinical medicine, Saunders 's Elsevier. 2009; 7 th ed.: 258-59.
2. Niki R. Colledge, Brian R. Walker, and Stuart H. Ralston, Davidson 's Principles & Practice of Medicine, Churchill Livingstone. 2010; 21 th ed.: 576-77.
3. Pieniazek P, Karczewska E, Duda A, Tracz W, Pasowicz M, Konturek S, Association of Helicobacter Pylori infection with coronary artery disease, Jagiellonian University, Cracow, Poland. 1999 Dec; 50(5): 743-51.
4. Fauci. Braunwald, Kasper, Hurrison 's Principles of Internal Medicine, Library of Congress Cataloging in Publication Data, 17 th ed., vol. (2); 2008: 946.
5. Pellicano R, Parravicini PP, Bigi R, Infection by Helicobacter pylori and acute myocardial infarction, Molinette Hospital, Turin, Italy. 2002 Jul; 25 (3): 315-21.
6. Medical Knowledge Self Assessment Program, American

College of Physicians.15 th ed., 2009; Gastroenterol 14-15.

7. Jafarzadeh A,Esmaeeli-Nadimi A,Nemati M, Tahmasbi A,Ahmadi P, Serum Concentration of Helicobacter Pylori IgG and the virulence factor CagA in patients with ischemic heart disease, Rafsangan University of Medical Sciences, Islamic Republic of Iran.2010 Oct;16(10):1039-44.

8.Andreica V, Sandica-Andreica B, Draghici A, Chiorean E,Georoceanu A, Rusu M, The prevalence of anti - Helicobacter pylori antibodies in patients with ischemic heart disease.

Luliu Hatieganu University of Medicine and Pharmacy,Cluj-Napoca, Romania.2004;42(1):183-9.

9. Franceschi F,Leo D,Fini L, Helicobacter pylori infection and ischemic heart disease: an overview of general literature, Catholic University of Rome,Rome,Italy.2005 May; 37( 5): 301-8.

10.Aceti A,Are R,Sabino G, Helicobacter Pylori active infection in patient with coronary heart disease, Sant's Andrea Hospital ,Rome, Italy.2004 Jul;49(1):8-12.