Seroprevalence of *Helicobacter pylori* among elevated HA1c and Type - 2 Diabetes Mellitus Patients attending Khartoum Hospitals

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Abstract

Background: There are conflicting reports on *Helicobacter pylori* prevalence and its relationship to patients with diabetes mellitus type - 2 (T2DM).

Aim: The current study was carried out to detect the sero-frequency of *Helicobacter pylori* among high HA1c and Type-2 diabetes mellitus patients in Khartoum.

Methods: A total number of 50 plasma samples were collected randomly from uncontrolled DM patient's attending different hospitals in Khartoum, Sudan from January to March 2016 and 40 plasma samples were collected from healthy individuals as controls. The detection of *Helicobacter pylori* IgG was performed by using an Enzyme–linked immune-sorbent assay (ELISA).

Results: *Helicobacter pylori* antibodies were detected in 24.0% HAc1 and Type-2 diabetes mellitus patient's and 47.5% control group (*P value* 0.02).

Conclusion: *Helicobacter pylori* infection is not associated significantly with high HAc1and Type-2 diabetes mellitus.

Key words: ELISA, HA1c, *Helicobacter pylori*, Khartoum Hospital, Sero-frequency, Type-2 Diabetes Mellitus.

Introduction

Helicobacter pylori (*H. pylori*) is a pathogen that colonizes about the half of the world's population worldwide and most patients acquire the infection during childhood. Infection with this pathogen causes chronic gastritis and significantly increases the risk of developing duodenal and gastric ulcer disease and gastric cancer [1]. The prevalence of *H. pylori* carriers in developing countries is very high ranging between 70 and 90% [2]. Regarding the carriage state of this pathogen many studies demonstrate an increasing rate in adults of 3 to 4% per decade [3]. *H. pylori* is a curved Gram negative bacillus produces catalase, urease,

and oxidase and motile via 3 to 5 polar flagella. The bacteria are found under the layer of mucus on the epithelium of the gastric anterum in most patients with active chronic gastritis, or gastric or duodenal ulcer [4].

Type - 2 Diabetes mellitus (T2DM) is a metabolic syndrome characterized by hyperglycemia and associated with multi-organs dysfunctions and failure. The prevalence of DM is about 2 - 3% [5] and varies widely around the world and among racial and ethnic groups [6]. Several published data link the presence of *H. pylori* with the development of several diseases among which are type 2 diabetes mellitus (T2DM), coronary disease, obstructive bronchitis, and renal disease [7].

Methods

Study design and population: The current is a case control study performed between January and March 2016. Fifty of high HAc1and type-2 DM infected patient's attending different hospitals in Khartoum-Sudan and 40 matched healthy control volunteers were enrolled in the current study. This study was approved by Al-Neelain University ethical committee board and an informed consent was obtained from each patient before collecting the demographic and clinical data.

Serological analysis: Specific enzyme based immunoassays (Siemens Healthcare; ELISA Kits; Marburg; Germany) for IgG antibodies to *H. pylori* was performed on serum samples from all cases and controls. An individual was considered to have been exposed to *H. pylori* if his or her serum had a level of reactivity which was greater than that of predetermined standards defined for the bacterium.

Data analysis: The generated data were analyzed by using master sheet and Statistical Package for Social Sciences (SPSS) program.

Results

Of the 50 of high HAc1and type-2 DM patients, 17 (34.0%) were males and 33 (66.0%) were females. While the 40 healthy participants control included 34 (85.0%) males and 6 (15.0%) were females. The age range between 32 and 68 and the median age is 51.8 years. All patients and controls blood samples were tested by ELISA for detection of *H. pylori* IgG antibodies, 12 (24.0%) of those patients were positive while 19 (47.5%) of the control were positive, (*P values* 0.02).

Relation between gender, age, and *H. pylori* IgG

Characteristic	Patients		Control		Total		*P. value*
	No.	%	No.	%	No.	%	
Study group	**50** (55.6%)		**40** (44.4%)		**90** (100.0%)		-
Gender							
Male	**17** (34.0%)		**34** (85.0%)		**51**(56.6%)		0.13
Female	**33** (66.0%)		**06** (15.0%)		**39** (43.4%)		
Age, years							
< 40	**07** (14.0%)		**36** (90.0%)		**43** (47.8%)		0.45
40 - 50	**05** (10.0%)		**02** (05.0%)		**07** (07.8%)		
> 50	**38** (76.0%)		**02** (05.0%)		**40** (44.4%)		
***H. pylori* IgG**							
Positive	**12** (24.0%)		19 (47.5%)		31 (34.4%)		0.02
Negative	**38** (76.0%)		21 (52.5%)		59 (65.6%)		

Discussion

The present study found no significant association between *H. pylori* IgG and high HAc1and T2DM infected patients. Previous studies on the association between *H. pylori* and diabetes have had varied results [8, 9,10,11, 12, 13], likely may due to inconsistencies in the methods used to define *H. pylori* positivity and diabetes status, the limited sample sizes in some studies, and adjustments for potential confounders. In the current study *H. pylori* infection is also not associated significantly with age and gender. In study done by Zelenkova et al 2002 [(14)] showed a lower sero-prevalence of *H. pylori* infection in of DM-Type 2, in comparison with the healthy population. This study conducted on 95 diabetic patients and 216 healthy blood donors, IgG antibodies were detected using ELISA method, the study found significant differences in sero-prevalence among diabetic patients group of (27%) and healthy blood donors (5 1%) p< 0.001 [14].

Conclusions

The current study revealed significant differences in sero-prevalence of *H. pylori* IgG among the group of high HAc1and T2DM patients (24%) and non-diabetic (Control) (47.5%). *Helicobacter pylori* infection is not associated significantly with high HAc1and Type-2 diabetes mellitus.

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