RELATIONSHIP BETWEEN *HELICOBACTER PYLORI* IMMUNOGLOBULIN G ANTIBODY AND THROMBOTIC ISCHEMIC STROKE

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Abstract- Several studies have assessed association between *Helicobacter pylori* infection and thrombotic ischemic stroke. This study was designed to investigate the association between this organism and ischemic strokes. Antibody against *H. pylori* (Hp IgG) was measured in 81 patients with stroke and 43 subjects without stroke. Hp IgG titer more than 20 u/ml was defined as positive. Hp IgG seropositivity was found in 67.4% of control subjects and 70.4% of cases (P = 0.838). The means of serum Hp IgG titers in control subjects and cases were 51.1859 u/ml and 50.1641 u/ml, respectively (P = 0.927). The difference between these 2 groups was not significant statistically. There wasn't any significant difference in seropositivity of Hp IgG between case and control subjects in men and women. It seems that *H. pylori* IgG titer hasn't a predictive role for thrombotic ischemic stroke.

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Key words: Ischemic stroke, *Helicobacter pylori*, atherosclerosis

INTRODUCTION

Cerebrovascular events, including cerebral infarction due to thrombosis or emboli and intracranial hemorrhage, are disabling diseases with many social and economical complications. One of the most common types of stroke is thrombotic ischemic stroke for which no definite treatment is available and most of the treatments are used to counteract risk factors such as hypertension, diabetes mellitus, hyperlipidemia and smoking. Therefore, recognition of such risk factors will help us to prevent cerebrovascular events. One of these risk factors that has introduced recently is *Helicobacter pylori* infection. It has been postulated that acute and exacerbating chronic infections may act by activating coagulation and chronic infection contribute to atherogenesis **(**1**).**

Considering controversies about the role of *H. pylori* infection in these events, we designed this study to investigate the influence of *H. pylori* infection on pathogenesis of thrombotic ischemic strokes and predictive role of antibody against *H. pylori* **(**Hp IgG) for this type of stroke.

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MATERIALS AND METHODS

A total of 81 patients with fully evolved or transient thrombotic ischemic stroke that were admitted to the Neurology Department of Alzahra Hospital in Isfahan, Iran, were studied in a cross sectional, case-control study that was performed from September 2005 to February 2006. The study

was approved by Ethics Committee of Isfahan University of Medical Sciences and written informed consent was obtained from all subjects. Lacunar infarct and intracranial hemorrhage were ruled out by using brain CT scan that was performed during the period of hospitalization of the patients.

Forty-three control subjects were selected from persons without any type of stroke that were adjusted for age, sex, hypertension, diabetes mellitus, hyperlipidemia and smoking with cases. All of the subjects with recent pulmonary infection (radiological or clinical) and ischemic heart diseases (according to history and electrocardiography) were excluded.

From each case 2 ml of fasting blood was obtained from antecubital vein and centrifuged within 2 hours after cooling at 4º C. Then its serum was separated and stored at -20º C for maximum 1 week. After that, it was stored at -70º C until the time of analysis. Sera were tested by one investigator using ELISA method by using Monobid kit. Cutoff point for Hp IgG titer was 20 u/ml and more than 20 u/ml was defined as positive.

We used *t* Student test for comparing antibody titer between two groups. For analysis of qualified data we used X^2 (chi-square) test. All of analysis was done by statistical software SPSS ver.15.

RESULTS

The mean age was 65.48 yr (SD=13.42) in case group, and 60.23 yr (SD=15.06) in control subjects. There wasn't any significant difference between these groups (P = 0.066). Forty-three women and 38 men were contributed in case group and 24 women and 19 men were in control group. There wasn't any significant difference between these groups (P = 0.851).

Hp. IgG was positive in 70.4% of cases and 67.4% of control subjects (Table 1), and there wasn't any significant difference between these groups (P = 0.838). The means of serum Hp IgG titer in case and control subjects were compared and the difference was not significant statistically (P = 0.927) (Table 2).

Table 1. Comparing the prevalence of HP IgG seropositivity in cases with thrombotic ischemic stroke and control subjects*

	Stroke	Normal	*P*
Males	73.7%	73.7%	1.000
Female	67.4%	67.5%	0.790
Total	70.4%	67.4%	0.838

*Data are given as percent.

Table 2. Comparing the HP IgG titer in cases with thrombotic ischemic stroke and control subjects*

	Stroke	Normal	*P*
Males	45.21	44.58	0.965
Female	56.46	54.95	0.928
Total	50.16	51.19	0.927

*Data are given as mean.

In females Hp IgG was positive in 67.5% of control group and 67.4% of case subjects (Table 1) and there wasn't any significant difference between two groups (P = 0.790). The mean of Hp IgG titer in females with stroke was compared with group without stroke and there wasn't any significant difference (P = 0.928) (Table 2). Also, in males there wasn't any statistically significant difference between case and control groups in Hp IgG seropositivity and titers of Hp IgG (Tables 1 and 2).

DISCUSSION

Thrombotic ischemic stroke is a multifactorial disease that has known risk factor such as genetic factors, hypercholesterolemia, hypertension, diabetes mellitus and smoking. Some patients, however, don't have any of these risk factors. Therefore it is necessary to investigate some new potential risk factors for thrombotic ischemic stroke in these patients. Recently, some infections have been introduced to contribute in thrombotic events, such as Coxsackie virus, Cytomegalovirus in transplanted heart, *Chlamydia pneumoniae* and *H. pylori* (2-9).

In our study the prevalence of HP IgG seropositivity wasn't higher in patients with thrombotic ischemic stroke than control subjects. In comparing the means of antibody titers in these two groups, the means of Hp IgG titer in case subjects was lower than control subjects but this difference wasn't significant statistically. We analyzed the data in males and females groups separately and the prevalence of Hp IgG seropositivity didn't show any

significant difference in case and control groups, neither in males nor in females. In agreement to our results, it was shown in Whincup *et al.* and Espinola-Klein *et al.* studies that Hp IgG is not a predictor of atherosclerotic plaque formation and stroke (10, 11).

HP IgG was proposed as a predictor of ischemic stroke only in some limited studies such as Grau *et al.* investigation in 1999 (12). In some investigation it was suggested that *H. pylori* has a role only in small arteries occlusion (13, 14), but we didn't assessed the patients with lacunar infarction (small arteries occlusion) in our study.

Interestingly, other investigations that have studied exclusively the virulent strain of *H. pylori* and compared cytotoxin associated gene-A (CagA) seropositivity in case and control groups, emphasized on the role of CagA positive strain of *H. pylori* in initiation of atherosclerosis and cerebrovascular events (15-19). According to this concept, it is better to perform future studies with more specific markers. Moreover, treatments should be targeted against virulent strain of *H. pylori*, although measurement of CagA seropositivity isn't performed currently in our laboratories.

In conclusion, Hp IgG seropositivity isn't a predictor of thrombotic ischemic stroke. In future studies, two points must be considered: 1) investigation about the predictive role of Hp IgM and Hp IgA seropositivity for thrombotic ischemic stroke, and 2) assessment of association between virulent strain of *H. pylori* infection and thrombotic ischemic stroke by CagA antibody measurement.

Conflict of interests

The authors declare that they have no competing interests.

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