Helicobacter Pylori specific antibodies among multiple sclerosis patients

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Abstract

Background: Multiple sclerosis (MS) is one of the most common neurological diseases that occurs predominantly in young adults and more commonly in women. MS is a chronic inflammatory disease characterized by demyelinating lesions in the brain, spinal cord, and optic nerve. This study aimed to compare Helicobacter pylori infection in patients with MS and the control group.

Methos: the study was case-control. And population consisted of patients referred to a neurological specialty clinic in Isfahan from 2015 to 2018, 107 cases in the case group and 107 in the control group. The case group was referred to causes such as headache, dizziness, and other diseases that had no established association with Helicobacter pylori. Case and control groups by referring to a laboratory through IgA and IgG antibodies against Helicobacter pylori were investigated.

Results: The mean age in the case and control group was 32 years. The mean IgA in the case group was 17.03 and in the control group 29.25, which was statistically significant (p-value=0.001). The mean IgG in the case group was 26.53 and in the control group was 48.69 which statistically significant (P=0.001). After the adjustment of the IgA and IgG levels on the variables such as age, gender, smoking, and history of autoimmune disease, there was a significant difference between the two groups (P-value=0.001) and in the control group, the IgA level was 11.42 and IgG levels were 21.2 points higher than the control group.

Conclusion: Generally. The results of this study showed that serum IgA and IgG antibodies in the control group were more than in the case group and there was a negative correlation between Helicobacter pylori infection and MS, and according to previous studies the results of this study suggest that Helicobacter pylori infection has a protective role in the pathogenesis of MS.

Keywords: Multiple sclerosis, Helicobacter pylori

Introduction

About 2.5 million people worldwide have Multiple sclerosis, a demyelinating inflammatory disease of the central nervous system (1). Despite the young age of onset, this disease imposes a high social-economic burden on individuals and society (2). Although the exact pathophysiology of MS is unclear, the environmental factors and the immune response are considered to be key factors (3).

According to previous studies, MS is more common where the infectious agent is more prevalent. On the other hand, A few studies have linked MS to the health hypothesis, which implies an insufficient immune response in people living in very "clean" environments. (4-5) Several studies have investigated

the relationship between sinusitis, chlamydia, pneumonia, Epstein–Barr virus (EPV), and herpesvirus 6 with MS (6-7).

Considering that Helicobacter pylori (HP)are associated with peripheral neuropathy and Guillain-Barre syndrome triggering the autoimmune reaction. This can happen due to the similarity of epitopes in nervous tissue and the cross-reaction antibodies with different components of the central and peripheral nervous system (8-9).

The easiest method to measure HP infection is measuring HP-specific IgG and IgA antibodies which are produced in response to the infection by immunoblotting or enzyme-Linked immunosorbent assay. In this study, we aimed to the association between HP infection and MS disease (10).

Methods and Materials

Participants

This study was carried out as a case-control study, and the patients who were referred to Esfehan Neurology Clinic between 2016 and 2018 were examined. Based on McDonald's criteria(Clinical and laboratory evaluations, as well as MRI data, to MS diagnosis), these patients are gradually identified and diagnosed with MS during the above period of time (11).

The control group was composed of people with no clinical symptoms of MS and were similar in terms of

age and gender (a matched group) and, at the same time, referred to the clinic for different reasons (headache-dizziness) unrelated to HP infection.

Measurements

The samples (individuals) were sent to the laboratory for testing for HP antibodies (IgA-IgG), and one person and one

laboratory examined all cases. Patient information such as age, sex, ethnicity, family history of MS, economic status, allergies, smoking, and autoimmune disease history was collected during face-to-face or telephone interviews. (Table-1)

Statistical analysis

After the initial collection, we described the findings with central and peripheral indicators. The level of Helicobacter exposure based on the level of IgA and IgG immunoglobulins in two groups will be investigated with the T-test and the effect of confounding factors with logistic regression.

The method for measuring economic status was based on the average monthly living expenses of the patient, which were divided into three levels. Also, economic indicators are used along with social indexes such as the level of education, family, and job, and a social-economic index is made for each person with Principal Component Analysis (PCA).

Results

In this study, the mean age of participants was 32 years. Overall, 107 people in each group were examined, including 89 females in the case group and

73 females in the control group, with significant gender differences between the two groups (p-value=011).

All of the subjects had "Fars" ethnicity. Regarding economic status, 96 people in the control group and 106 people in the case group had an average financial status, and the difference between the two groups was significant (p-value=0.010). In terms of family history of MS (p=0.316) and history of other

Table1. Comparison of the demographical characteristics of MS patients and controls

variable		Case group		Control group		P-value
		frequency	percent	frequency	percent	
gender	male	18	16.80%	34	31.80%	0.011
	female	89	83.20%	73	68.30%	
Economic status	low	4	3.70%	0	0	0.01
	Moderate	96	89.70%	106	99.10%	
	high	7	6.50%	1	0.90%	
MS Family history	yes	2	1.90%	0	0	0.155
	no	105	98.10%	107	100%	-----
Autoimmune diseases history	Yes	1	0.90%	0	0	0.316
	No	106	99.10%	107	100%	
Smoking using	Yes	6	5.60%	11	10.30%	0.206
	No	101	94.40%	96	89.70%	

MS, Multiple sclerosis

Table2. Comparing the levels of IgA and IgG in MS and control groups

	Groups	Mean	SD	Mode	Median	Min	Max	Q1	Q3	P-value
IgG	case	26.53	32.37	3.4	14.1	1.2	178.7	8	32.9	0.001
	control	48.69	36.24	120	43.2	1.1	169	21	69.9	
IgA	case	17.03	24.26	12.1	8.6	0.1	147.5	2.6	24	0.001
	control	29.25	23.57	16	23.4	0.2	104	15.2	40	

MS, Multiple sclerosis

P-value reported for Mann-Whitney

autoimmune diseases (p=0.316), and smoking (p=0.206), there was no significant difference between the two groups.
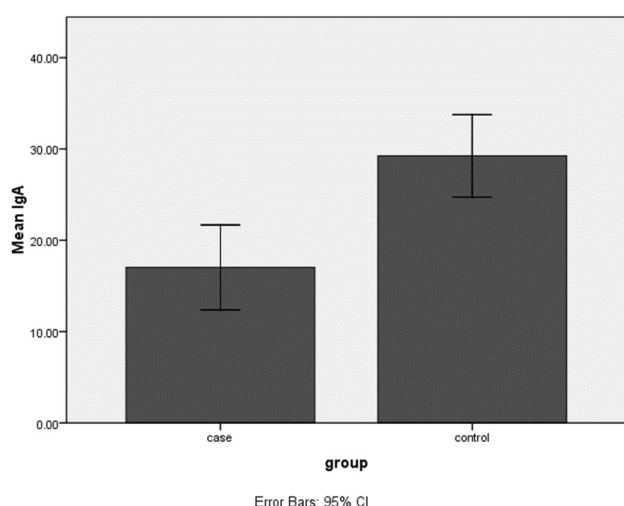

Figure1.Comparison of mean serum IgA level in control and MS
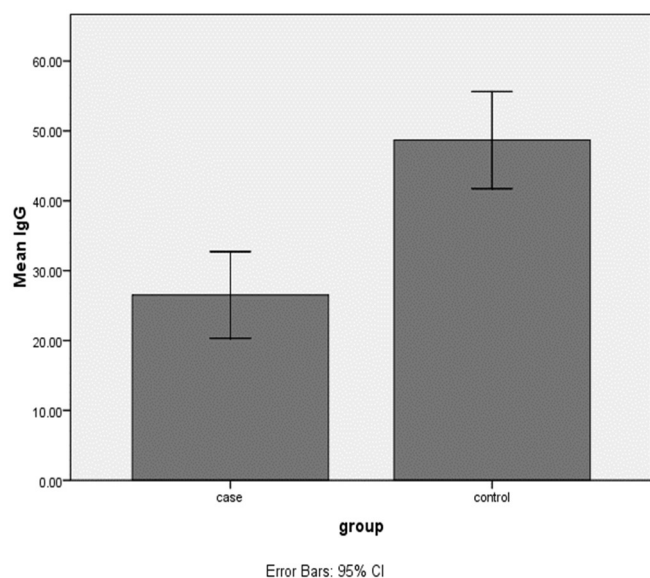
groups

Figure2.Comparison of mean serum IgG level in control and MS groups

Both groups were exposed to daily sunlight for more than 3 hours. They had no history of allergies, and the mean duration of the MS in the case group was 10.48 ± 4.69 years. The mean IgA level in the case group in the case group was 17.03± 24.26,

while it was 29.25±23.57 in the control group (Figure 1). Moreover, the IgG level in the case group was 26.53± 32.37, and in the control group, it was 48.69±36.24 (Table 2, Figure 2).

Figure2.Comparison of mean serum IgG level in control and MS groups

According to the regression analysis results, even after adjusting the levels of IgA and IgG to the confounding variable (age and sex, financial status, smoking, and autoimmune history), there was still a significant difference between the two groups (P-value=0.001). Furthermore, the IgA level in the control group was 11.42 units higher than in the MS patient, which was in Line with Ranjbar et al. study (12). In the control group, the IgG level was 21.2 units higher than in the patient group, which was also in line with Pedrini et al. study (13).

Discussion

According to the Nourollah et al. study, it was concluded that IgG against CagA(cytotoxin-associated gene A) is directly related to the acute phase of MS. In contrast, IgG against VacA(vacuolating cytotoxin A) has a lower level in patients than in the control group. These two findings show that HP has an antonym relation with MS (14).

Conclusion

In this study, the serum level of HP IgG and IgA were significantly lower in the MS patients compared to the control group, and there was a negative correlation between HP infection and MS so, therefore, Helicobacter infection may play as a protective factor in MS pathogenesis. Further studies are needed to identify the exact pathophysiological link between HP and MS.

Declaration

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Conflict of interest

there is no conflict of interest

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