

Relationship Between ABO Blood Group and Migraine

Migren ve ABO Kan Grubu İlişkisi

Osman Korucu¹, Oktay Bulur²

¹Keçiören Eğitim ve Araştırma Hastanesi, Nöroloji Kliniği

²Keçiören Eğitim ve Araştırma Hastanesi, Dahiliye Kliniği

Amaç: ABO kan grubu ile ilgili hastalıklar bulaşıcı hastalıklar (kolera, helicobacter pylori, echerichia coli), kardiyovasküler hastalık, maligniteler ve alerjik durumlardır. Çalışmamızda ABO kan grubu ile migren arasındaki ilişkiyi araştırmayı amaçladık.

Materyal ve Metot: Nöroloji polikliniğinde Ocak 2008 ve Aralık 2018 tarihleri arasında migren tanısı almış ve kan grubu olan 985 erişkin hasta dosyası geriye dönük olarak incelendi. Hastane bilgi sisteminden hastaların yaş, cinsiyet ve kan grupları kaydedildi.

Bulgular: Hastalarda kan gruplarının dağılımı: A Rh+: 383(%38,89), A Rh-: 53(%5,38), B Rh+: 148(%15,03), B Rh-: 16(%1,62), AB Rh+: 93(%9,44), AB Rh-: 8(%0,81), o Rh+: 257(%26,09), o Rh-: 27(%2,74) bulundu.

Sonuç: Çalışmamızda A Rh+ kan grubunun migren hastalarında en sık görülen kan grubu olduğunu bulduk.

Anahtar Kelimeler: Migren, ABO, Kan grubu

Objectives: Disorders related with ABO blood group are infectious disease (cholera, helicobacter pylori, echerichia coli), cardiovascular disease, malignancies and allergic status. We aimed to elucidate the association between ABO blood group and migraine.

Materials and Methods: We investigated retrospectively the files of 985 adult patients who were diagnosed with migraine and had blood type between January 2008 and December 2018 in neurology outpatient clinics included in the study. The age, gender and blood group of the patients scanned and recorded retrospectively from the hospital data system.

Results: Distribution of blood groups in patients as follows: A Rh+: 383(38.89 %), A Rh-: 53(5.38 %), B Rh+: 148 (15.03 %), B Rh-: 16(1.62 %), AB Rh+: 93(9.44 %), AB Rh-: 8(0.81 %), o Rh+: 257(26.09 %), o Rh-: 27(2.74 %).

Conclusion: We found that in our study A Rh+ blood group was most prevalence blood group in migraine patients.

Keywords: Migraine, ABO, Blood Group

Yazışma Adresi / Correspondence:

Osman Korucu

Keçiören Eğitim ve Araştırma Hastanesi Nöroloji Kliniği, Ankara

e-mail: osmankorucu@yahoo.com

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Introduction

After identification at the beginning of the 20th century, blood groups were suggested to be associated with many diseases. Disorders related with ABO blood group are infectious disease (cholera, helicobacter pylori and Escherichia coli), cardiovascular disease, malignancies, thyroid diseases and allergic status.¹⁻⁵ Despite the relation with diseases and blood groups has not been shown with certainty. Some researches postulated that ABO blood group antigens might be associated with general inflammatory response and single nucleotide polymorphisms in the ABO locus may increase TNF- α and soluble intercellular adhesion molecule-1 (ICAM-1) levels.⁶⁻¹⁰ In

addition studies, were determined that there was an association between HLA antigens and ABO blood groups.^{11, 12}

Migraine is a one of frequent type of primary headache syndromes. It is an important cause of labour loss and reducing quality of life under the fifty years old.¹³ Studies aiming to determine the factors that plays role in migraine pathophysiology had showed multifactorial. These are genetic susceptibility, environmental factors, calcitonin gene related peptide, pituitary adenylate cyclase activating polypeptide, hormones, drugs and metabolism.¹⁴

There is not enough research to show the relation of ABO blood group and migraine. Our research aimed to clarify the effect of ABO blood group type on migraine.

Materials and Methods

We investigated retrospectively the files of 985 adult patients who were diagnosed with migraine and had blood type between January 2008 and December 2018 in neurology outpatient clinics included in the study. The age, gender and blood group of the patients scanned and recorded retrospectively from the hospital data system. There were no missing data. Yıldız's study results used as a control study.¹⁵

Our study is a descriptive study and there were no exclusion criteria. Blood groups of cases assessed by the InvitroGel test system, MTC, Germany.

This study accepted by local ethics committee with the number: 022019/1830.

Normality of the distribution of the continuous variables was determined by the Kolmogorov-Smirnov test. Continuous variables with normal distribution were expressed as mean \pm SD. Variables with skew distribution were expressed as median (minimum-maximum), and categorical variables were expressed as percentage. We performed a chi-squared test for the comparison of two proportions (from independent samples), expressed as a percentage. Statistical analysis was performed with MedCalc Statistical Software version 18.11.3 (MedCalc Software bvba, Ostend, Belgium; <https://www.medcalc.org>; 2019) and SPSS 15.0 for Windows. P value < 0.05 was accepted as statistically significant.

Results

We analyzed 985 adult patients (age: median 37 (minimum 18, maximum 90 years old)), 907 of whom were female (92.08 %), and 78 of whom were male (7.92 %). Distribution of blood groups in patients as follows: A Rh+: 383(38.89 %), A Rh-: 53(5.38 %), B Rh+: 148(15.03 %), B Rh-: 16(1.62 %), AB Rh+: 93(9.44 %), AB Rh-: 8(0.81 %), O Rh+: 257(26.09 %), O Rh-: 27 (2.74 %). (Table 1)

When we compare ABO blood groups in migraine patients and control group according to gender. There was no significant difference between migraine patients and control study in males ($p > 0.05$). However, in female migraine patients, A and AB blood groups were significantly higher than control study ($p = 0.001/p = 0.018$). Whereas O and B groups were significantly lower in female migraine patients ($p = 0.001/p = 0.035$). When groups compared by Rh status there was not statistically significant difference between migraine patients and control study results. (Table 2-3)

Table 1. Distribution of Patients' Blood Groups According to Gender

Gender	Blood Group								Total
	A Rh+ n (%)	A Rh- n (%)	B Rh+ n (%)	B Rh- n (%)	O Rh+ n (%)	O Rh- n (%)	AB Rh+ n (%)	AB Rh- n (%)	
Female	357 (39.37)	49 (5.40)	134 (14.77)	15 (1.65)	234 (25.80)	26 (2.87)	85 (9.37)	7 (0.77)	907
Male	26 (33.33)	4 (5.13)	14 (17.95)	1 (1.28)	23 (29.49)	1 (1.28)	8 (10.26)	1 (1.28)	78

Comparison of total numbers in ABO groups and Rh status, A and AB blood group was significantly higher in migraine patients ($p=0.001$). Nevertheless o blood group and Rh status ratio was lower than the control study ($p=0.604$). (Table 4-5)

Table 2. ABO blood group comparison according to gender

Gender	ABO Group	Results		Control study		p
		n	%	n	%	
Female	A	406	44.76	493	35.96	0.001*
	O	260	28.67	505	36.84	0.001*
	B	149	16.43	273	19.91	0.035
	AB	92	10.14	100	7.29	0.018*
	Total	907	100	1,371	100	
Male	A	30	38.46	52,445	38.99	0.942
	O	24	30.77	49,914	37.12	0.249
	B	15	19.23	22,822	16.97	0.587
	AB	9	11.54	9,304	6.92	0.109
	Total	78	100	134,485	100	

Table-3: Rh groups comparison according to gender

Gender	Rh	Results		Control study		p
		n	%	n	%	
Female	Rh positive	810	89.31	1196	87.20	0.131
	Rh negative	97	10.69	175	12.80	
	Total	907	100	1371	100	
Male	Rh positive	71	91.03	120,902	89.90	0.746
	Rh negative	7	8.97	13,583	10.10	
	Total	78	100	134,485	100	

Discussion

We found that in our study A Rh+ blood group was most prevalence blood group in migraine patients. Geographical location and the ethnicity effects the ABO blood group dispersion.¹⁶ There are several epidemiological researches about blood group

distribution in Turkey. In the east and west providence of Turkey blood group dispersion is A,O,B,AB respectively.¹⁷⁻¹⁸ This order was consistent with our findings.

Table 4. Comparison of total numbers in ABO groups

ABO Group	Results		Control study		p
	n	%	n	%	
A	436	44.26	52,938	38.97	0.001*
O	284	28.83	50,419	37.11	0.001*
B	164	16.65	23,095	17	0.739
AB	101	10.26	9,404	6.92	0.001*
Total	985	100	135,856	100	

Table 5. Comparison of total numbers in Rh status

Rh	Results		Control study		p
	n	%	n	%	
Rh positive	881	89.44	122,098	89.87	0.604
Rh negative	104	10.56	13,758	10.13	
Total	985	100	135,856	100.0	

Although the relation between ABO blood groups and different diseases was investigated in several animal and human studies, there are very few studies about ABO blood groups and migraine or neurological diseases. In 1976 Mehne et al. considered blood groups might have an effect on Alzheimer pathogenesis, Renvoize advocated the opposite.¹⁹⁻²⁰ Massimo Franchini and friends showed the O blood group is protective against neurodegenerative diseases in their study.²¹ In our literature inquiry, we found only one article that searches migraine and blood group link. This study reported prevalence of migraine was highest in O blood group.²²

When we consider the pathogenesis of migraine, we think that the antigenic structure of blood groups may be effective in this process.

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