

# Impact Factor Migraine on Biomarkers and ABO Blood Distribution in Karbala<sup>1</sup>

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## INTRODUCTION

### Headache

The great majority of headaches are harmless events characterized by discomfort in any region of the head. Pain can manifest unilaterally or bilaterally. Pain might be subtle and throbbing, or it can be intense and radiating. A common headache's length can also vary substantially. Simple headaches caused by stress, excessive alcohol use, smoking, and weariness are easily cured with aspirin and calm slumber. The cause of more complicated headaches is unknown, however it could be due to aberrant nerve activity, regional changes in brain blood flow, or the improper release of pain-transmitting neuropeptides. Headaches are divided into two types: primary headaches and secondary headaches. (1).

One of the most prevalent conditions affecting the nervous system is headache disorders, which are characterized by recurrent headaches. Migraine, tension-type headaches, and cluster headaches are only a few of the major headache illnesses that can cause severe and incapacitating headaches (2). One such these is the migraine headache, which is widespread, common, incapacitating, and fundamentally manageable (3) but is also undervalued and undertreated. A frequent chronic headache disorder called migraine is characterized by recurrent headaches that last four to seventy-two hours, have a pulsating quality, are moderate to severe in severity, are made worse by regular physical activity, and are accompanied by nausea, vomiting, photophobia, or phonophobia (4).

Because of its enormous impact on patient quality of life (QOL), it has been termed the "seventh disabler" (5). It is the leading cause of headache in children and adolescents. Migraine research in the juvenile population is critical due to the stress it causes children and their families, as well as the diagnostic and treatment hurdles caused by a wide range of phenotypic and likely differential diagnosis(6)

### Migraine

#### Definition

Migraine is defined as "a recurring headache syndrome associated with other symptoms of neurologic dysfunction in varying admixtures" or "an episodic headache with certain features, such as sensitivity to light, sound, or movement" (7). Refractory migraines are defined as "having failed all of the available preventatives and suffering from at least 8 debilitating headache days per month for at least 6 consecutive months"(8). Resistant migraines are defined as "having failed at least three classes of migraine preventatives and experiencing at least 8 debilitating headache days per month for at least 3 consecutive months without improvement" (9). Other conditions that can be related to migraines include somnambulism, cyclic vomiting, abdominal migraine, benign paroxysmal vertigo, benign paroxysmal torticollis, and confusional migraine. Each

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illness has a different clinical presentation, course, and prevalence (9). The distinct phases of migraine include a premonitory phase, brief neurological signs (like a migraine aura), a severe headache attack, and a postdrome phase (10). Additionally, migraine is a debilitating ailment that affects a person's finances, relationships with family, and activities at work and in school (11).

### **Epidemiology**

A migraine is one of the most typical types of headaches. The prevalence of migraines during a year varies between 10% and 15%. (12-16) Prior to puberty, 3-7% (15–17) of people experience migraines within a year. Nearly similar amounts of effect are felt by both genders. The frequency is higher in those between the ages of 20 and 50. At this period of life, women have a three times higher risk of becoming afflicted than men. Around 30 (18), the gender gap in prevalence is at its largest.

### **Treatment**

Nonpharmacologic therapy and pharmacologic therapies are the two types of migraine treatments. Nonpharmacologic therapy include educating the patient about the condition, its processes, treatment techniques, and lifestyle adjustments involved in avoiding migraine triggers. The brain does not appear to withstand the ups and downs of life well in migraine patients. Thus, regular sleep, regular meals, exercise, avoiding stress peaks and troughs, and avoiding dietary triggers can all be beneficial(19). The key lesson is that the patient should strive for habitual consistency rather than adhering to a large list of food and activity restrictions. The fact that the identical modifications meant to prevent migraines from occurring will have different results on various days leaves many patients upset by this uncertainty. Patients may benefit from being informed about the nature of this variability. Recently, a review of nonpharmacologic migraine treatments based on evidence was released (20).

Drugs used regularly, whether or not a headache is present, to reduce the frequency and severity of attacks (32) and those used to treat attacks when they happen can be divided into two categories. Treatments for migraine attacks can also be divided into migraine-specific and non-specific categories. Aspirin, acetaminophen, nonsteroidal anti-inflammatory medications, opiates, and combination analgesics are nonspecific medicines used to treat a wide range of pain conditions. However, some types of pain, such as pure tension-type headaches or atypical facial pain (21), cannot be treated with certain drugs, such as ergotamine, dihydroergotamine, and triptans (22) which are effective for treating neurovascular headaches, such as migraines and cluster headaches. Triptans shouldn't be used as diagnostic testing agents in patients with headache because there are placebo reactions (23), there is a significant rate of nonresponse to oral medications, and triptans haven't been thoroughly studied in patients with conditions like subarachnoid hemorrhage or meningitis(24,25).

### **ABO Blood Group System**

A, B, AB, and O are the four main blood group phenotypes that are recognized by the ABO blood group system. The presence or absence of two antigens (A and B) serves as its definition. According to Mendel's law, each parent contributes one haplotype to the inheritance of the antigens. ABO antigens are found in red blood cell membranes, the majority of human cells and tissues, as well as tissues from animals. (27,28).(29,30,31).

### **Clinical significance**

Blood type O is often the most common worldwide, followed by types A and B, however there is variation in the ABO phenotypic frequencies among other ethnic and racial groupings. The Asian population has a higher prevalence of type B. The ABO phenotype with the highest rarity is blood type AB.(32,33) ABO antigens are expressed on the surface of numerous different types of human cells in addition to being found on red blood cells. The significance of ABO blood type antigens goes beyond transfusion medicine, since numerous reports point to the ABO system's participation in a number of disease processes. ABO blood types have been associated with increased risk of developing a number of illnesses, including cancer, infections, cardiovascular disease, and hematologic disorders (34,35).

## **PATIENTS AND METHOD**

### **Patient Selection**

During their visit to the neighborhood hospital and a neurologist's private clinic, 158 migraine sufferers were chosen, ranging in age from 10 to 85, including 90 men and 78 women. Each patient was given a migraine diagnosis.

## Patient Design

### Inclusive Criteria

- Migraine patient according to medical history and patient data from private clinic and hospital
- Age 10 years old and above.
- Both male and female gender were included.

### Exclusive Criteria

- Patients with other CNS conditions, with the exception of one epileptic patient;
- \* patients having headaches from sources other than anemia.
- \*Renal and bone diseases were comorbid in some of the patients.
- \* Nursing a baby while pregnant.

## Study Groups

The patients were allocated to two main groups:

Group 1 (G1): Include 168 patients with migraine

Group 2 (G2): Include 136 without migraine

## Methods

We examined the medical records of 168 people with a certain blood type who had been diagnosed with migraines by a specialist doctor. Data on the patient's age, gender, BMI, underlying diseases, and blood group were scanned and recorded from the hospital and private clinic.

## Result

### Demographic data

The age group's median was 34.47. The findings indicated that patients under the age of 25 made up the majority (42.4%), followed by patients aged 25 to 45 (34.2%). The proportion of patients between the ages of 46 and 65 was 19.1%, while the proportion of patients above 65 was only 4.3%. In accordance with the results, males outnumbered females by 54.3%. The majority of patients (44.1%) had a normal body composition and the mean BMI was 25.05, as shown in the table below:

Demographic data			
		Frequency	Percent %
Gender	female	139	45.7
	male	165	54.3
Age group	less than 25	129	42.4
	25 - 45	104	34.2
	46-65	58	19.1
	more than 65	13	4.3
BMI	Under weight	9	3.0
	Normal	134	44.1
	Over weight	96	31.6
	Obese1	54	17.8
	Obese2	11	3.6
Total		304	100.0

Table (3-1): demographic data

Demographic data			
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Total		304	100.0

**The frequencies of underlying diseases**

The result showed the frequencies of the blood group and the underlying diseases of the patients as showed in table below :

**Table 3.2 : the frequencies of underlying diseases**

		Frequency	Percent
Valid	anemia	3	1.0
	Asthma	4	1.3
	DM	13	4.3
	DM and HTN	14	4.6
	Epilepsy	1	.3
	Heart disease	1	.3
	HTN	28	9.2
	NO	235	77.3
	pcos	2	.7
	Sinusitis	1	.3
	Systemic sclerosis	1	.3
	Thyroid gland disease	1	.3
	Total	304	100.0

**Table 3.3: the percentage of blood group**

	Frequency	Percent	
Valid	A-	3	1.0
	A+	78	25.7
	AB-	7	2.3
	AB+	35	11.5
	B-	5	1.6
	B+	55	18.1
	O-	12	3.9
	O+	109	35.9
	A-	3	1.0
	Total	304	100.0

**The association between the migraine and other variables**

The association between the diagnosis and other variables, as shown in the table below, showed the significance by using chi-squared and according to the p-value.

**Table 3.4 : The association between the migraine and other variables**

variables	P value	Significant or not
migraine and gender	0.783	Not significant
migraine and age group	0.001	significant
migraine and body mass index	0.47	significant
migraine and Underlying diseases	0.183	Not significant
Migraine and blood group	0.046	significant

**The association between migraine and age group**

The result of the association between migraine and age group was significant ( $p = 0.001$ ) and that mean the cases of migraine was highly increase in age group (25-45) and that make the middle age is highly susceptible for migraine as showed in table below:

**Table 3.4.1 : the association between migraine and age group**

Crosstab						
			migraine		Total	
			no	yes		
age_group	less than 25	Count	97	32	129	
		% within age_group	75.2%	24.8%	100.0%	
		% within migraine	71.3%	19.0%	42.4%	
		% of Total	31.9%	10.5%	42.4%	
	25 - 45	Count	25	79	104	
		% within age_group	24.0%	76.0%	100.0%	
	45 65	% within migraine	18.4%	47.0%	34.2%	
		% of Total	8.2%	26.0%	34.2%	
		45 65	Count	13	45	58
			% within age_group	22.4%	77.6%	100.0%
			% within migraine	9.6%	26.8%	19.1%
		% of Total	4.3%	14.8%	19.1%	
more than		Count	1	12	13	
		% within age_group	7.7%	92.3%	100.0%	
		% within migraine	0.7%	7.1%	4.3%	
		% of Total	0.3%	3.9%	4.3%	
Total	Count	136	168	304		
	% within age_group	44.7%	55.3%	100.0%		
	% within migraine	100.0%	100.0%	100.0%		
	% of Total	44.7%	55.3%	100.0%		

Association between migraine and Body Mass Index(BMI)

**The result of the association between migraine and age group was significant ( $p = 0.047$ ), and that means the cases of migraine decreased while the BMI increased.**

**Table 3.4.2 : the association between migraine and Body Mass Index (BMI)****The association between Migraine and bloodgroup**

Cross ab						
			migraine		Total	
			no	yes		
BMI	Underweight	Count	7	2	9	
		% within bmi_1	77.8%	22.2%	100.0%	
		% within migraine	5.1%	1.2%	3.0%	
		% of Total	2.3%	0.7%	3.0%	
	Normal	Count	68	66	134	
		% within bmi_1	50.7%	49.3%	100.0%	
		% within migraine	50.0%	39.3%	44.1%	
		% of Total	22.4%	21.7%	44.1%	
	Overweight	Count	38	58	96	
		% within bmi_1	39.6%	60.4%	100.0%	
		% within migraine	27.9%	34.5%	31.6%	
		% of Total	12.5%	19.1%	31.6%	
		Obese 1	Count	20	34	54
			% within bmi_1	37.0%	63.0%	100.0%
	% within migraine		14.7%	20.2%	17.8%	
	Obese 2	Count	3	8	11	
		% within bmi_1	27.3%	72.7%	100.0%	
		% within migraine	2.2%	4.8%	3.6%	
	Total		Count	136	168	304
			% within bmi_1	44.7%	55.3%	100.0%
% within migraine			100.0%	100.0%	100.0%	
% of Total			44.7%	55.3%	100.0%	

The result of the association between migraine and age group was significant ( $p = 0.001$ ) and that mean the cases of migraine was increase with the Rh+ and the most of the cases were in A and AB and less in O and B as showed in table below

**Table 3.4.3: the association between Migraine and blood group**

<b>Bloodgroup * migraine Crosstabulation</b>					
			migraine		Total
			no	yes	
bloodgroup	A-	Count	0	3	3
		% withinbloodgroup	0.0%	100.0%	100.0%
		% within migraine	0.0%	1.8%	1.0%
		% of Total	0.0%	1.0%	1.0%
	A+	Count	29	49	78
		% withinbloodgroup	37.2%	62.8%	100.0%
		% within migraine	21.3%	29.2%	25.7%
		% of Total	9.5%	16.1%	25.7%
	AB-	Count	4	3	7
		% withinbloodgroup	57.1%	42.9%	100.0%
		% within migraine	2.9%	1.8%	2.3%
		% of Total	1.3%	1.0%	2.3%
	AB+	Count	10	25	35
		% withinbloodgroup	28.6%	71.4%	100.0%
		% within migraine	7.4%	14.9%	11.5%
		% of Total	3.3%	8.2%	11.5%
	B-	Count	4	1	5
		% withinbloodgroup	80.0%	20.0%	100.0%
		% within migraine	2.9%	0.6%	1.6%
		% of Total	1.3%	0.3%	1.6%

	B+	Count	25	30	55
		% within blood group	45.5%	54.5%	100.0%
		% within migraine	18.4%	17.9%	18.1%
		% of Total	8.2%	9.9%	18.1%
	O-	Count	7	5	12
		% within blood group	58.3%	41.7%	100.0%
		% within migraine	5.1%	3.0%	3.9%
		% of Total	2.3%	1.6%	3.9%
	O+	Count	57	52	109
		% within blood group	52.3%	47.7%	100.0%
		% within migraine	41.9%	31.0%	35.9%
		% of Total	18.8%	17.1%	35.9%
Total	Count	136	168	304	
	% within blood group	44.7%	55.3%	100.0%	
	% within migraine	100.0%	100.0%	100.0%	
	% of Total	44.7%	55.3%	100.0%	

## DISCUSSION

### Human ABO Blood Groups and Diseases Associated with Each

Numerous research on the ABO phenotype demonstrate a commensurate relationship between genetically determined human ABO blood types and an elevated risk of numerous infectious and noninfectious disorders. However, more research is required, especially at the molecular level of ABO blood classes and their correlation with different disorders (37,38).

### Frequency of ABO and Rh Blood Groups in Patients with Diabetes Mellitus.

Patients with diabetes mellitus in the local population group were found to have the following ABO and Rh blood group frequencies: 52 (20.8%) in A+, 55 (22%) in B+, 23 (9.2%) in AB+, 97 (38.8%) in O+, 2 (0.8%) in A-, \*(3.2%) in B-, 3 (1.2%) in AB-, and 10 (4%) in O (39,40,41,42).

### Relationship Between ABO Blood Group and Migraine

Although the relationship between ABO blood groups and different diseases has been investigated in several animal and human studies, there are very few studies about ABO blood groups and migraines or neurological diseases(43,44).

In a study on the connection between blood types and migraines conducted in Turkey, data on age, gender, and ABO blood groups were collected from the hospital and compared between migraine sufferers and a control group for each patient's gender. Male migraine sufferers did not differ significantly from the control group ( $p > 0.05$ ) from the migraine control group(45,46). A and AB blood groups, however, were noticeably higher in female migraine patients than in the control sample ( $p = 0.001/p = 0.018$ ). While female migraine patients in the O and B groups had considerably reduced rates ( $p = 0.001/p = 0.035$ ), respectively. There was no statistically significant difference between migraine patients and control study outcomes when groups were evaluated by Rh status. (47,48).

### The association between migraine and age group

The correlation between migraine and age group produced a significant result. ( $p = 0.001$ ), which indicates that migraine cases were significantly rising in the 25–45 age range, making middle age a very suspect age for migraine (49,50,51).

### The association between migraine and Body Mass Index(BMI)

The result of the association between migraine and age group was significant ( $p = 0.047$ ) and that mean the cases of migraine decrease while the BMI increase

### The association between Migraine and blood group

The result of the association between migraine and age group was significant ( $p = 0.001$ ) and that mean the cases of migraine was increase with the Rh+ and the most of the cases were in A and AB and less in O and B

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