

The Relationship between Migraine and Rheumatoid Arthritis

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Abstract: This study aims to find out the relationship between rheumatoid arthritis and migraine with the Study period Full year from 23-7-2020 to 1-8-2021. In this study, demographic information and data were collected from different hospitals in Iraq, where 88 patients were collected, divided into two groups (49 patients' group - 39 control group). The study aimed to know the relationship between migraine and rheumatoid arthritis. The results which found in this study (the most frequent complications in this study were depression for patients with episodic migraine for 11 patients, followed by Anxiety for eight patients. As for the migraine with aura patients, severe complications were found that lead to Stroke were a recurrence of 5 patients, and in general, the prevalence rate of Stroke were for 13 patients). By using the Person correlation between the type of migraine with RA found a positive relationship with Pearson Correlation*0.334 at p Value 0.038 to this study, and when comparing this relationship with the control group, an inverse relationship was found with Pearson Correlation -0.119at p value 0.472. We concluded in this study there is a two-way relationship between migraines and rheumatoid arthritis.

Keywords: Rheumatoid arthritis, migraine, RDA, CRP, BMI, Person correlation, BMI.

INTRODUCTION

Rheumatoid arthritis is a chronic autoimmune inflammatory disease that mainly affects the joints [van der Woude, D. *et al.*, 2018]. However, it is known that the inflammatory response of rheumatoid arthritis is not limited to the joints [Jeong, H. *et al.*, 2017] but can also affect other organs of the body and has been shown to be linked to cardiovascular, lung, and neuropsychiatric diseases [Wang, Y.C. *et al.*, 2017].

Migraine is a common neurological disease that causes severe pain and a throbbing sensation on one side of the head that may last for several hours and may last for several days [Kalaydjian, A. *et al.*, 2008; Danese, E. *et al.*, 2014]. It usually includes a headache with nausea. Vomiting, sensitivity to light, smell, or sound, dizziness, and visual disturbances [Jamshidi, A.R. *et al.*, 2016; Sheehy, C. *et al.*, 2006; Nerurkar, L. *et al.*, 2019].

Most migraine attacks last 4 to 72 hours. Although effective treatment can shorten them to a few hours. On the other hand, some migraine attacks can last more than 72 hours [Liu, Y. *et al.*, 2012; Morreale, M. *et al.*, 2014; Tjensvoll, A.B. *et al.*, 2013].

On the other hand, a migraine is a headache that appears in the form of recurrent attacks caused by various factors. In migraines, the central nervous

system [Le Pira, F. *et al.*, 2013; Zhang, Q. *et al.*, 2016], the immune system, inflammation, and genetics are all involved.

It has recently been discovered that rheumatoid arthritis is linked to migraines [Zeytin, A.T. *et al.*, 2014; Lapucci, C. *et al.*, 2019], although there are few studies investigating this relationship. Previous research reported that migraine patients were more likely to develop rheumatoid arthritis [Sinnecker, T. *et al.*, 2019; Rossato, G. *et al.*, 2010; Dimitroulas, T. *et al.*, 2017], and it has been suggested that these two diseases share an inflammatory process and an autoimmune response that explains their relationship [Rodríguez-Carrio, J. *et al.*, 2018].

They found that 26.6 percent of a group of 64 people with rheumatoid arthritis were likely to have neuropathic-like pain, and 21.9% had potential neuropathic pain. Neuropathic pain often results from damage to nerve fibers that send pain signals to the brain [Kim, S.Y. *et al.*, 2019; Kim, S.K. *et al.*, 2019; Lee, S.Y. *et al.*, 2019].

In another 2019 study, researchers found that migraines occur more often in middle-aged male participants with psoriasis than in those without psoriasis, and researchers did not find a significant association in female participants or other age

groups [Kim, S.Y. *et al.*, 2020; Sung, Y.K. *et al.*, 2013; Cho, S.K. *et al.*, 2013].

In another study, Nate All 2000 found that patients with rheumatoid arthritis had a higher likelihood of developing migraines regardless of gender, and more research is needed in this regard. [Buse, D.C. *et al.*, 2020; Boer, A.C. *et al.*, 2018]

MATERIALS AND METHODS

Patient Sample

In this study, demographic information and data were collected from different hospitals in Iraq, where 88 patients were collected, divided into two groups (49 patients' group - 39 control group). The study aimed to know the relationship between migraine and rheumatoid arthritis.

STUDY DESIGN

This study was based on the statistical analysis program IBM Soft SPSS 25, where a cross-sectional study was conducted on 88 people distributed (49 patients' group - 39 control group).

The mean age in this study ranged between 45 and 80 years for 51 female patients and 37 male patients.

RESULTS

Table 1: Baseline characteristics of demographic patients according to age

age * group Crosstabulation				
Count				
		group		Total
		control	patient	
age	45.00	1	3	4
	48.00	3	1	4
	49.00	3	1	4
	50.00	4	0	4
	51.00	3	1	4
	52.00	3	1	4
	53.00	1	3	4
	55.00	1	3	4
	58.00	2	2	4
	60.00	2	2	4
	61.00	2	2	4
	62.00	0	4	4
	64.00	0	4	4
	67.00	0	4	4
	68.00	1	3	4
	69.00	1	3	4
	70.00	2	2	4
72.00	2	2	4	
74.00	3	1	4	
76.00	3	1	4	

Patients' primary information was collected, which consisted of (height - weight, from which the body mass index of the patients was calculated.

In addition, information recorded related to erythrocyte sedimentation rate-C-reactive protein-Modified Health Assessment Questionnaire.

Migraine is accompanied by an increase in white matter lesions on MRI of pseudo-infarct lesions and white and gray matter volume changes in the brain, which appear in patients with or without aura to the same extent, and the results were scored by relying on the clinical significance of the MRI findings.

Study Period

Full-year from 23-7-2020 to 1-8-2021.

AIM OF STUDY

This study aims to find out the relationship between rheumatoid arthritis and migraine

	80.00	2	6	8
Total		39	49	88

Table 2: Distribution of patients according to sex

		sex			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	2.2	2.2	2.2
	f	51	56.7	56.7	58.9
	m	37	41.1	41.1	100.0
	Total	90	100.0	100.0	

Table 3: Distribution of patients according to BMI

BMI * group Crosstabulation				
Count				
		group		Total
		control	patient	
BMI	27.00	4	1	5
	28.00	8	7	15
	28.50	1	3	4
	28.60	4	1	5
	29.00	3	7	10
	29.90	1	4	5
	30.00	2	3	5
	30.60	3	2	5
	30.66	1	4	5
	31.00	3	2	5
	31.30	2	3	5
	32.00	3	7	10
	32.50	3	2	5
	33.30	1	3	4
Total		39	49	88

Table 4: Results of patients according to CCI

CCI * group Crosstabulation				
Count				
		group		Total
		control	patient	
CCI	1	8	15	23
	2	10	21	31
	3	14	6	20
	4	7	1	8
	5	0	6	6
Total		39	49	88

Table 5: Descriptives results of rheumatoid disease activity

Descriptives ^a					
		group		Statistic	Std. Error
RDA	control	Mean		2.0128	.04750
		95% Confidence Interval for Mean		Lower Bound	1.9167
				Upper Bound	2.1090
		5% Trimmed Mean		2.0226	
		Median		2.0000	
		Variance		.088	

		Std. Deviation	.29663		
		Minimum	1.30		
		Maximum	2.50		
		Range	1.20		
		Interquartile Range	.30		
		Skewness	-.367	.378	
		Kurtosis	.029	.741	
	patient	Mean	4.3020	.15574	
		95% Confidence Interval for Mean	Lower Bound	3.9889	
			Upper Bound	4.6152	
		5% Trimmed Mean	4.2574		
		Median	4.3000		
		Variance	1.189		
		Std. Deviation	1.09020		
		Minimum	2.50		
		Maximum	7.30		
		Range	4.80		
		Interquartile Range	1.75		
		Skewness	.570	.340	
		Kurtosis	-.049	.668	

a. There are no valid cases for RDA when group = .000. Statistics cannot be computed for this level.

Table 6: Statistics results of the study

Statistics		Modified Health Assessment Questionnaire patient	Modified Health Assessment Questionnaire control	CRP patients	C reactive protein control	ESR CONTROL	ESR PATIENT
N	Valid	39	49	39	49	49	39
	Missing	51	41	51	41	41	51
Mean		1.8000	1.2204	48.4103	35.6531	53.5714	68.9744
Median		1.8000	1.2000	47.0000	36.0000	54.0000	68.0000
Mode		1.70	1.20	44.00 ^a	38.00	55.00	64.00 ^a
Std. Deviation		.15218	.13537	4.67197	1.73867	2.15058	4.74335
Skewness		-.331	-.388	.124	-.082	-.030	.131
Std. Error of Skewness		.378	.340	.378	.340	.340	.378
Kurtosis		-.747	-.778	-1.401	-1.291	-1.134	-.990
Std. Error of Kurtosis		.741	.668	.741	.668	.668	.741
Range		.50	.40	15.00	5.00	7.00	17.00
Minimum		1.50	1.00	40.00	33.00	50.00	60.00
Maximum		2.00	1.40	55.00	38.00	57.00	77.00

a. Multiple modes exist. The smallest value is shown

Table 7: Distribution of patients according to the type of migraine

		type of migraine			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		41	45.6	45.6	45.6
	Chronic	12	13.3	13.3	58.9
	Episodic	29	32.2	32.2	91.1

	Migraine with aura	8	8.9	8.9	100.0
	Total	90	100.0	100.0	

Table 8: General outcomes of patient migraine (Sample characteristics Ra and migraine status)

Complication * type of migraine Crosstabulation						
Count						
		VAR00014				Total
			Chronic	Episodic	Migraine with aura	
Complication		41	3	0	0	44
	Anxiety	0	0	8	0	8
	Coronary artery disease	0	0	0	3	3
	Depression	0	2	11	0	13
	Epilepsy	0	4	5	0	9
	Stroke	0	3	5	5	13
Total		41	12	29	8	90

Table 9: Person correlation between the type of migraine, control of study with RA

Correlations				
		type of migraine	CONTROL	RA
type of migraine	Pearson Correlation	1	-.119	.334*
	Sig. (2-tailed)		.472	.038
	N	39	39	39
CONTROL	Pearson Correlation	-.119	1	-.006
	Sig. (2-tailed)	.472		.973
	N	39	49	39
RA	Pearson Correlation	.334*	-.006	1
	Sig. (2-tailed)	.038	.973	
	N	39	39	39

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: Logistic regression to analysis risk factor on patients

Variable	CI-95%	P-value
Age	2.5 (1.9-3.5)	<0.001
Chronic	2.3 (1.6-2.8)	<0.001
Episodic	2.6 (2.2-3.1)	<0.001
Migraine with aura	2.7 (2.3-4.1)	<0.001
BMI	1.3 (0.9-1.8)	0.06
ESR	1.7 (1.33-2.1)	0.003

DISCUSSION

This study discussed the quality of the relationship between rheumatoid arthritis and migraine, as 88 samples were collected and divided into two groups (49 patients' group - 39 control group).

The analysis of the results of the patients was based on the IBM soft spss 25 programs, and the real value and the arithmetic mean were to the age of the patients 62 ± 0.3 , and it was noted that the body mass index increased to the age of patients aged between 70-80 years above 30 kg / m² and in this study the patients were distributed According to gender (51 female patients with 56.7%, 37 male patients with 41.1%).

Patients were distributed according to CCI, and CCI (score)*2 was the most frequent in this study for 21 patients and ten controls.

The erythrocyte sedimentation rate (ESR) measures the erythrocyte sedimentation rate (erythrocyte sedimentation rate) and its relative stability. When the test is performed, red blood cells accumulate at the bottom of the tube. ESR is defined as how quickly the red blood cells settle at the bottom of the test tube. Red blood cells usually settle relatively slowly in the tube, but in some cases, this rate may be accelerated, as in exposure

to injury or infection, autoimmune disease, chronic disease, or another medical condition.

And there were significant statistical differences between the two groups when analyzing CRP, or C-reactive protein, which is a protein produced by the liver, and the percentage of this protein is usually low in the blood. Its levels increase in the blood when the body has a condition that causes inflammation, so the CRP test measures the amount of this protein in the blood to detect any inflammation in the body due to a violent health condition or to monitor disease progression in chronic health conditions.

The results of the elevated CRP analysis indicate the presence of some inflammation in the body, as we mentioned, but it is an inaccurate indicator as it does not specify the type or source of inflammation, and this is because the CRP protein is released into the blood within a few hours immediately after infection with the disease.

Table 7 shows the general outcomes of patient migraine (sample characteristics Ra and migraine status).

The most frequent complications in this study were depression for patients with episodic migraine for 11 patients, followed by Anxiety for eight patients. As for the migraine with aura patients, severe complications were found that lead to Stroke were a recurrence of 5 patients, and in general, the prevalence rate of Stroke were 13 patients.

By using the Person correlation between the type of migraine with RA found a positive relationship with Pearson Correlation*0.334 at p Value 0.038 To this study and when comparing this relationship with the control group, an inverse relationship was found with Pearson Correlation -0.119at p value 0.472.

Literature study showed a two-way relationship between migraine and rheumatoid arthritis in the adult population. According to the results of this study, the risk of migraine was approximately 1.5 times higher in patients with rheumatoid arthritis compared to patients without the disease or the control group. On the other hand, patients with rheumatoid arthritis were more likely to have migraines, with the exception of men over 60 years of age.

Other diseases that appear to be associated with both migraines and rheumatoid arthritis include depression, obesity, and sleep disturbances.

CONCLUSION

In this study, we concluded that there is a two-way relationship between migraines and rheumatoid arthritis. That is, migraines increase the risk of developing rheumatoid arthritis, and this is linked to an increased risk of migraines.

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