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Fibromyalgia in Rheumatoid Patients, Depression and Cognitive Dysfunction

Mona I. Nabih[1], Noha M. Khalil[a], Olfat Shaker[2], Mahmoud Ghanema[1], Sarah A. Hassan[1]

[1]*Internal Medicine Department, Rheumatology and Clinical Immunology Unit, Faculty of Medicine, Cairo University, Egypt*
[2]*Biochemistry and Molecular Biology Department, Faculty of Medicine, Cairo University, Egypt*

*Corresponding author's E-mail: Mahmoud_ghanema@yahoo.com

Article History	Abstract
             CC License 	***Aim of the work:*** *To correlate relation between depression, cognitive dysfunction and fibromyalgia (FM) in rheumatoid patients.* ***Patients and methods****: The study was done on 60 patients, in 2 groups, Group A: Active, and Group B inactive patients. 9 were FM and 51 patients without FM Depression was diagnosed based on PHQ 9 depression scale test Cognitive function was assessed by MOCA test.* ***Results:*** *Mean scale of depression in FM 16.78 ± 6.38 while in patients free of FM are 12.27 ± 5.39 with statistically significant p value. Mean scale of cognitive dysfunction in patient with FM was 23.33 ± 3.87 while in patients without are 22.9 ± 4.51 without statistically significant p value.* ***Conclusions:*** *There is statistically significant correlation between depression and fibromyalgia and no statistically significant correlation between cognitive function and fibromyalgia.* **Keywords:** *RA; Cognitive dysfunction; Depression; fibromyalgia*

1. Introduction

Fibromyalgia is a chronic, centralized pain syndrome characterized by disordered processing of painful stimuli. Fibromyalgia is diagnosed more frequently in women than in men. Diffuse chronic pain, poor sleep, exhaustion, cognitive failure, and mood swings are all symptoms of fibromyalgia. Rheumatologic diseases, functional somatic syndromes, and psychiatric diagnoses are examples of comorbid conditions that could exist. Patients with diffuse chronic pain may find the Fibromyalgia Rapid Screening Tool to be an effective screening tool. The Analgesic, Anesthetic, and Addiction Clinical Trial Translations Innovations Opportunities and Networks-American Pain Society Pain Taxonomy diagnostic criteria or the American College of Rheumatology criteria can be used to identify fibromyalgia. Diagnosis confirmation and education can comfort patients and reduce needless testing. (Winslow et al, 2023).

Inflammatory arthritis and extra-articular involvement characterise rheumatoid arthritis (RA), a systemic autoimmune illness. This condition is characterised by persistent inflammation of the synovial joints and has an etiological origin that remains a mystery. Small peripheral joints are often affected first, and if ignored, the condition may spread to larger proximal joints. (Bullock et al., 2018).

Although RA is categorised as an inflammatory joint disease of symmetric synovial joints, extra-articular manifestations are common. Consistent with previous large cohort studies, Italian research discovered that up to 40% of RA patients had extra-articular involvement at some time in the course of their illness. At any time following the beginning of RA, patients may experience the life-threatening extra-articular manifestations (EAMs), which have been linked to a higher risk of dying from the illness. Patients with severe, active illness, as well as those who test positive for rheumatoid factor/anti-CCP Abs and/or HLA-DR4, are more likely to have extra-articular organ involvement as a result of their RA.

There is a wide range of neuropsychiatric RA symptoms. Stroke is more likely to occur in persons over the age of 60 who have a history of rheumatoid arthritis due to the increased incidence of atherosclerosis caused by inflammation (Joaquim et al. 2015).

Two-thirds of people with RA also suffer from the psychological symptoms of depression and anxiety, and these have been related to the progression of the illness (Fiest et al. 2017).

Cognitive function assessments may be significantly underperformed by RA patients when compared to controls (Oláh et al., 2020). According to a recent study (Meade et al. 2018), Even minor CD may have an effect on a person's capacity to function and quality of life.

According to a recent study (Meade et al. 2018), Cognitive impairment in RA has been linked to a number of conditions, including exhaustion, disturbed sleep, and the use of medications. However, these factors may not always play a role "(Lawlor 2002).

2. Materials And Methods

Cross section research on RA patients was conducted, classified in 2 groups: Group A: active RA, while group B: inactive patients. 9 were FM and 51 patients without FM Everyone of both sexes is welcome to participate. Using the American College of Rheumatology's (ACR) 2010 Preliminary Diagnostic Criteria for Fibromyalgia, individuals were categorised as having fibromyalgia or not (Wolfe et al. 2010). All participants provided written informed permission once our study was approved by a local institutional review board.

The following factors were taken into account while selecting the patients:

Criteria for acceptance:
Each and every one of the sexes.
Individuals older than 18 years of age.
The sick and the healthy, patients with ailments both at rest and in full swing.

These criteria were disregarded in order to lessen the impact of confounding variables Smoking.

DM.\sHTN
Assumed CAD.
Ischemic stroke.
Poor lipid profiles, diabetes, and thyroid problems.
Traumatic brain injury with memory loss in the past.
a permanent impairment of neurologic function.
Substance addiction, substance dependency, or a mental health disorder that needs treatment are all possible causes.

The following steps were taken:
Complete physical examination including the heart, lungs, abdomen, and nervous system. Examinations that are standard procedure at a laboratory include a complete blood count, urea, serum creatinine, serum uric acid, urine analysis, liver enzymes (ALT, AST), acute phase reactants (ESR, CRP), and a lipid profile (total cholesterol, LDL-C, HDL, C, Serum triglycerides). Anti-CCP and ANA antibodies; rheumatoid factor.

Using the DAS28 to measure the severity of RA disease:
Number of swollen joints (out of 28), number of sensitive joints, and duration of symptoms are all factors in the DAS28 (out of the 28), results from a blood test for C reactive protein (CRP) or erythrocyte sedimentation rate (ESR) The results of a health questionnaire filled out by the patient.

3. Results and Discussion

Sixty people participated in the study, which was split into 2 groups:
-Group A is active RA patients while Group B is inactive RA patients.
-Fibromyalgia status is used to further categorise rheumatoid arthritis patients. 9 were FM and 51 patients without FM, in other words, none had diabetes, hypertension, dyslipidemia, or a history of smoking.

Table 1: comparison between patients with fibromyalgia in patient groups:

		Group A		Group B	
		Count	%	Count	%
Fibromyalgia	Yes	6	20.0%	3	10.0%
	No	24	80.0%	27	90.0%

Table (1) showed comparative study between 2 groups according to have fibromyalgia or not. In group A, 20 % were with fibromyalgia and only 10 % in group B.

Table 2: Comparison between patients with and without fibromyalgia in 2 groups according to cognitive function, depression and BNDF:

	Fibromyalgia				
	Yes		no		P value
	Mean	SD	Mean	SD	
COGNITIVE FUNCTION	23.33	3.87	22.9	4.51	0.561
depression	16.78	6.38	12.27	5.39	0.034

Table (2) showed Comparison between patients with and without fibromyalgia in 2 groups according to cognitive function, depression and BNDF: Mean cognitive function in patient with FM 23.33 ± 3.87 while in others without FM are 22.9 ± 4.51 without statistic significant P value. Mean depression level of patient with FM is 16.78 (± 6.38), in others without FM 12.27 (± 5.39) with statistic significant P value.

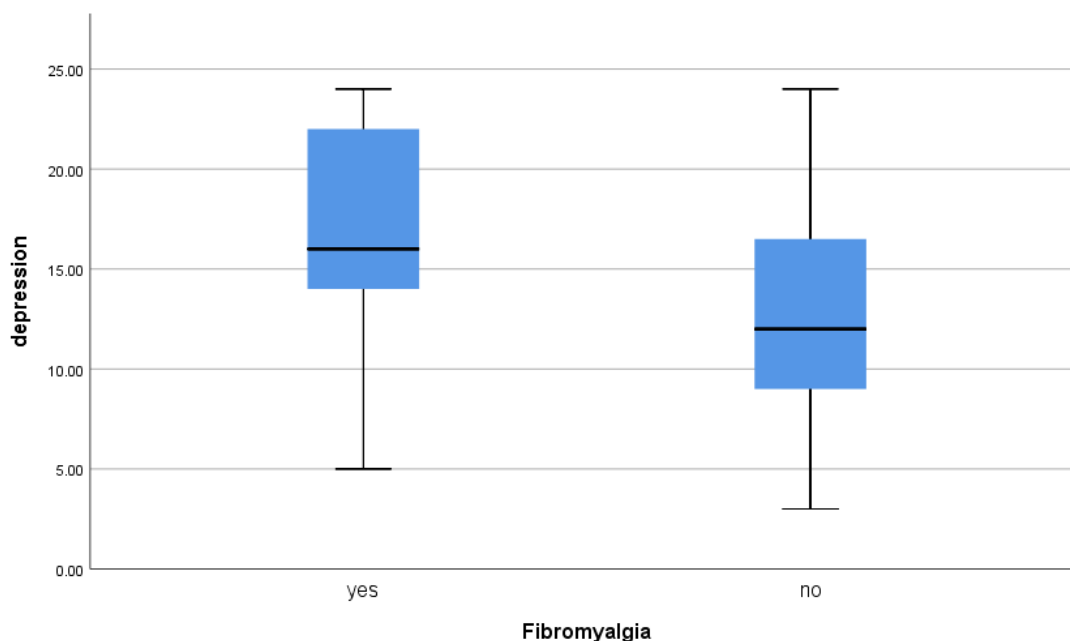**Figure 1**: Comparison between patients with and without fibromyalgia in 2 groups according to depression:

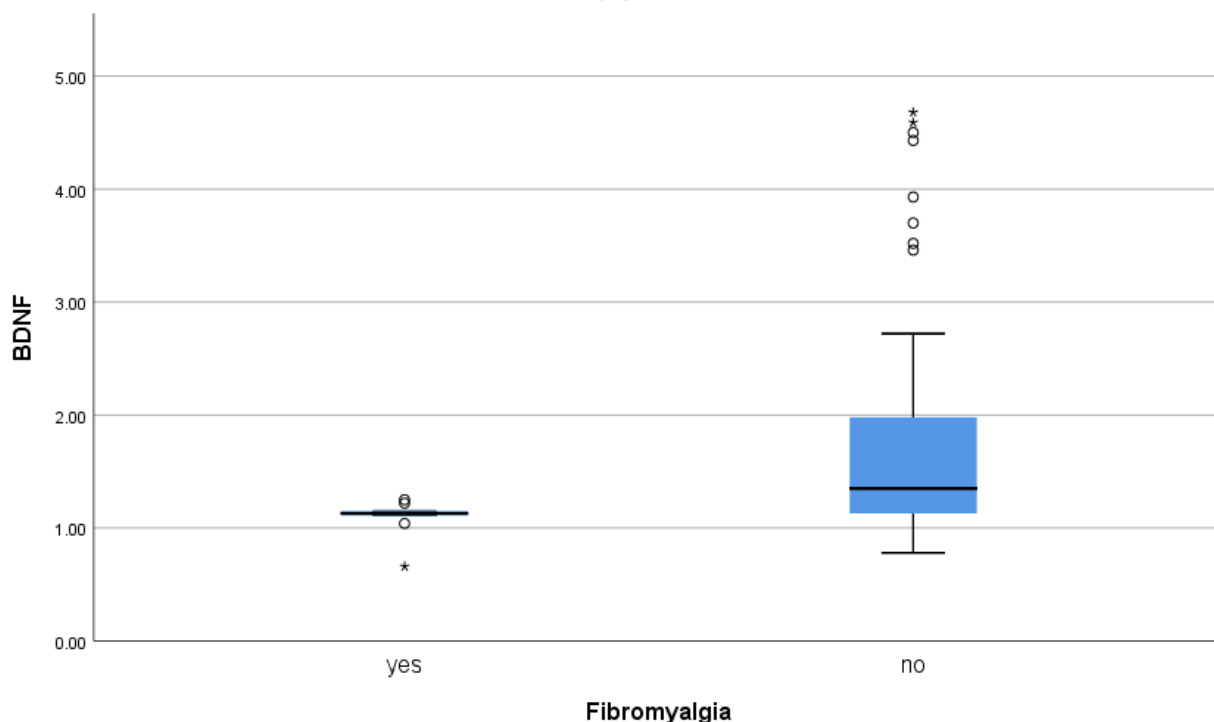**Figure 2:** Comparison between patients with and without fibromyalgia in 2 groups according to BDNF:

Table 3: Comparison between patients with and without fibromyalgia in 2 groups according to cognitive function, depression:

		Fibromyalgia				P value
		yes		No		
		Count	%	Count	%	
COGNITIVE FUNCTION	**Normal**	3	33.3%	17	33.3%	1
	Abnormal	6	66.7%	34	66.7%	
Depression	**None**	0	0.0%	4	7.8%	
	Mild	1	11.1%	12	23.5%	
	Moderate	2	22.2%	20	39.2%	0.260
	Moderately severe	2	22.2%	8	15.7%	
	Severe	4	44.4%	7	13.7%	

In patients with fibromyalgia, % of patients with cognitive dysfunctions 66.7% and its similar to that in non-fibromyalgic patients. In patients with fibromyalgia, none are depressed, all have it in different degrees while in patient free of fibromyalgia, 4 % are free of depression.

A person's ability to think and act depends on their cognitive abilities, which include navigation, attention, concentration, judgement, memory, learning, and the processing of linguistic, visual, spatial, and executive information (Meade et al. 2018). More research and studies are needed to address the frustrating issue of cognitive impairment. In our patients, 20% of those in group A had fibromyalgia compared to 10% in group B.

Rheumatoid arthritis (RA) is accompanied by a high risk of developing depression, with prevalence rates ranging from 14% to 48%. It's important to note that there seems to be a two-way relationship between depression and RA, with RA patients also exhibiting a higher incidence of depression. On the other hand, people with depression are more likely to acquire RA than the overall population. Ionescu et al. (2022)

The PHQ 9 test shows that 6.7% of our patients in either the active or inactive groups are completely depressed-free, while the rest have varying degrees of depression. The mean depression score was

15.17(6.24) in group A and 10.73(4.18) in group B, with a statistically significant difference (P .05). There were a majority of severe to moderate cases (80%).

Researchers Pezzato et al. 14% of the population experienced depression at some point. High scores on the TJC-68 (p = 0.011), PhGA (p = 0.001), PGA (p = 0.001), VAS (p = 0.001), DAS28 (p = 0.007), SDAI (p = 0.001), CDAI (p = 0.001), and HAQ (p = 0.001) were seen in depressive individuals compared to those who were not depressed. Of the 70 patients with depression, 30 had a history of depression and still met the criteria for depression at the time of the evaluation; only 11 (15.7%) were taking antidepressants. The use of pharmaceuticals, a high score on the HAQ, being male, and a high PGA score were all shown to substantially enhance the likelihood of depression in a multivariate analysis. (Pezzato, et al., 2021).

4. Conclusion

Twelve separate studies were discovered by Dickens et al. comparing depressive symptoms in RA patients with those in healthy controls. Across studies, the magnitude of depression's effect was small to moderate (r =.21, p .0001; diverse). (Dickens et al., 2002).

Imran et al. recruited 102 patients with RA from Fatima Memorial Hospital's Rheumatology Department. Correlation coefficients between depression, the Rheumatoid Arthritis Disease Activity Score (DAS 28), and the Patient Health Questionnaire-Revised were calculated to examine the association between depression and disease activity (severity) of RA (HAQ). Researchers discovered that the degree to which arthritis patients experienced depression was proportional to the severity of their condition. Twenty-three patients (22.5 percent) were classified as having moderate depression, while nineteen patients (18.6 percent) were classified as having severe depression. Imran et al. (2015).

In our patients, mean cognitive function in patient with FM 23.33 ± 3.87 while in others without FM are 22.9 ± 4.51 without statistic significant P value Mean depression level of patient with FM is 16.78 (± 6.38), in others without FM 12.27 (± 5.39) with statistic significant P value.

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