

## **Social Cognition and Attachment Profiles of Fibromyalgia Syndrome Patients in Comparison with Healthy Subjects**

### **ABSTRACT**

Background: Fibromyalgia syndrome (FMS) is a chronic syndrome primarily characterized by widespread musculoskeletal pain. Although its etiology is not fully understood, complex interactions between biological, genetic and psycho-sociological factors thought to be effective in the onset and maintenance of FMS. Psychological factors could be explained by social cognitive concepts, which include mentalizing other person's intentions, beliefs, behaviors and attachment styles. Objectives: In this study we aimed to examine social cognitive and attachment profiles of FMS patients. Methods: The participants were recruited from Marmara University Pendik Training and Research Hospital.

Sociodemographic data were questioned in both groups while FMS group was also administered Fibromyalgia Impact Questionnaire (FIQ) to determine disease severity. In order to evaluate social cognition profiles of the participants, Reading Mind in the Eyes Test (RMET), Empathy Quotient (EQ) and Experiences in Close Relationships-Revised were applied by the same researcher. Results: 41 women with FMS and 44 healthy women matched for education and age were involved in the study. There was no significant difference in sociodemographic parameters between FMS and control groups. FMS patients did not differ significantly from control subjects in means of RMET and EQ scores. Although no significant difference found between attachment anxiety, FMS patients were found to have more avoidant attachment style than control group. Conclusion: FMS patients may have no social cognition impairments, especially in lack of any psychiatric comorbidities.

Moreover, these patients may suffer from avoidant type of insecure attachment and this attachment style may effect social support seeking behaviour of these patients.

### **What's already known about this topic?**

FMS is diagnosed more frequently in primary care settings and patient-centered approaches are becoming more important in management of FMS. It is a replicated finding in literature that FMS patients suffer from social cognition difficulties and attachment insecurities. These findings contribute to a better understanding of psychological aspects of FMS.

### **What does this article add?**

This article replicates the attachment profiles of FMS patients. In contrast to the relevant literature, findings from this study shows that FMS patients have similar Theory of Mind and empathy abilities with healthy controls.

## INTRODUCTION

Fibromyalgia Syndrome (FMS) is a chronic condition characterized by symptoms like widespread musculoskeletal pains, depression, anxiety, sleep disturbances, fatigue.

Although chronic musculoskeletal pain is frequently considered as main symptom, most patients complain about also headache, abdominal pain, stiffness, social and cognitive dysfunctions and irritability (1).

Various studies show that FMS is a common disorder seen almost all societies. Most studies report a prevalence of %2-4 (2). There are also studies showing that in primary care every twentieth patient show FMS symptoms and this trend of increasing FMS diagnosis and treatment through primary care family medicine clinics is continuing (3). Nevertheless difficulties to assess and objectively measure chronic pain cause delayed diagnosis of FMS and because of such difficulties actual prevalence of this debilitating condition seems to lower as expected (4).

The etiology of FMS is not fully understood but it is conceptualized as a multifactorial condition, as there are many factors like genetic, neuroendocrine disorders, stress and psychiatric disorders contributing to the clinical manifestation. More specifically FMS patients show high levels of depression (%20-80) and anxiety disorders (%13-64), difficulties in expression of emotions and relational problems (5). In this context, there are various

studies showing impairments in social cognitive functions and attachment styles of FMS patients and insights from these studies have contributed to develop attachment-oriented therapy modalities in this patient group.

Social cognition implies experiencing and detecting social stimuli and the capacity to infer or define these stimuli. Different subtypes of social cognition like Theory of Mind, empathy, face recognition, reflective functioning and attachment styles are well defined and researched (6).

Theory of mind (ToM) as a sub-domain of social cognition refers to the ability to infer mental states such as thoughts, beliefs and intentions to oneself or another people. As one of the first tools to evaluate ToM functions, Reading the Mind in the Eyes Test (RMET) became a standard method to test of social sensitivity of participants and employed most frequently as a tool to evaluate affective ToM. In one of the few studies on ToM function in FMS, Di Tella et al found lower performance of FMS patients in RMET compared to healthy controls (7). Similarly in their large FMS and control subjects of 101 participants in each group Ozsoy et al found significantly low RMET scores in FMS patients (8).

As a closely related concept to ToM, empathy refers to ability to take the perspective of the other people and show affective response to emotions of others. Although there are various scales to assess empathy clinically or for research purposes, EQ is considered one of the gold standards in clinical research. There can be found only a few studies on empathic abilities of FMS patients. In one of them Di Tella et al reported that FMS patients show similar empathy levels with healthy controls (7).

Attachment theory implies that the relationship between primary caregiver and the child from early infancy effects the emotion regulation, coping mechanisms and resilience, capacity to adapt social and psychological changes in adulthood. Roughly classified as secure and insecure modes, various studies show that attachment types have significant effects on pain related parameters like pain perception, overall social functioning and depressive symptoms. Unlike the scarcity of studies on social cognitive profiles of FMS patients, attachment research in this patient group is relatively rich. Oliveira et al. reported that attachment styles of FMS patients can predict anxiety levels and physical and mental well-being (9). Govender et al reported more avoidant and less anxious type of attachment in FMS and insecurely attached patients like avoidant type show higher levels of depression, hopelessness and negative thoughts (10). Kratz et al showed that FMS patients who have insecure attachments are more prone to perceive pain as more catastrophizing (11). There are also studies showing FMS patients manifest insecure attachment parameters like low self-confidence, more need for approval and fear of rejection (12).

Although there are various studies on social cognitive parameters and attachment styles of FMS patients, studies investigating these parameters together in FMS patients are scarce. It may be suggested that investigating social cognition with a dimension of attachment may contribute to efforts of developing more sophisticated psychosocial interventions in FMS patients.

## **MATERIAL AND METHOD**

Participants are recruited from Marmara University Research and Training Hospital - Physical Medicine and Rehabilitation Outpatient Clinic. FMS subjects between 18-65 ages who agreed to participate to the current study, are evaluated and diagnosed by a specialist PMR. Exclusion criteria consisted of any chronic pain syndrome except FMS, pregnancy or postpartum period, any chronic medical condition, any diagnosis of psychiatric or neurological disorder. Control Subjects are recruited from Marmara University Research and Training Hospital - Family Medicine Outpatient Clinic, who are consulted for routine medical controls without any medical or psychiatric disorders and matched with the patient group in age, sex and years of education. All evaluations including data collection and implementation of tasks are conducted through live interviews by the same researcher. All the participants gave their written informed consent to participate in the study. The current study was approved by the Ethics Committee of Marmara University, Date/Protocol: 01.03.2019/ 09.2019.302.

### **Clinical and Psychometric Measures**

#### **1-The Fibromyalgia Impact Questionnaire**

Developed by Burckhardt et al, FIQ is one of the most used instrument to assess clinical severity of FMS patients (13). FIQ consists of 10 questions and each question can be scored between 0-10. A total score higher than 70 is considered as severe form of FMS. Turkish validity and reliability study of FIQ was conducted by Sarmer et al and the reported that Turkish version is valid and reliable to conduct clinical studies with FIQ (14).

## **2-The Reading the Mind in the Eyes Test**

RMET is originally developed by Baron-Cohen et al. to study ToM abilities in various psychiatric disorders (15). Although original test battery consists of 36 pictures, Turkish version of RMET includes 32 pictures, 19 male and 13 female pictures of eye region, and there are four mental states assigned for each picture, one of which is the correct answer, as suggested by reliability and validity study (16).

**3-Empathy Quotient:** EQ is a 60-item self-report scale developed by Baron-Cohen et al. (17). It has 4 point Likert type design and responses are coded on a scale ranging from “strongly agree” to “strongly disagree.” Kose et al reported that the Turkish version of the scale is valid and reliable to employ in Turkish population (18).

**4-Experiences in Close Relationships-Revised:** ECR-R is a self-report scale and consists of 36 items. It assesses attachment in two dimensions; attachment anxiety and avoidance, both dimensions have 18 items. Developed by Brennan et al, ECR-R has 7 point Likert type design and participants can have scores between 18-126 points of each dimensions (19). It is reported also valid and reliable in Turkish, as the reliability and validity of Turkish version of scale used widely to assess attachment in various study designs (20).

## **Statistical Analysis**

IBM SPSS Statistics Version 26 and Graphpad Prism 8 were used to analyze data. Distribution analysis was evaluated by Kolmogorov-Smirnov and Shapiro Wilks test. Independent samples t-test was used to analyze numerical variables with normal distribution and Mann Whitney U test used with abnormally distributed variables. Categorical variables were analyzed with Chi-Square and Fisher's Exact test. For correlation analysis Pearson's correlation and Spearman's correlation tests were used. Cut-off for significance were considered when P-values were below 0.05.

## **RESULTS**

All participants in FMS and control group consisted of female participants. As shown in Table 1 two study groups did not differ in means of sociodemographic parameters.

None of the FMS patients had a history of hospitalisation by reason of FMS. Mean onset of age in FMS group was 36,66 ( $\pm 9,61$ ), mean duration of illness was 9,44 ( $\pm 8,23$ ) years and total duration of treatment was 2,42 ( $\pm 4,09$ ). Mean FEA score of FMS patients was found as 66,79 ( $\pm 13,67$ ).

As shown in Table 2 study groups did not differ significantly in means of RMET and EQ scores ( $p = 0,330$ ). Although FMS patients had similar scores with healthy controls in ECR-R anxiety dimension ( $p = 0,921$ ), former group obtained significantly higher scores on ECR-R Avoidance dimension,  $56,85 (\pm 27,00)$  versus  $45,09 (\pm 15,50)$  with a  $p$  value of ( $p = 0,018$ ). Moreover categorical distribution of different attachment styles are shown in Table 4.

### **Correlation Analysis**

As shown in Table 3 FIQ scores of FMS patients negatively correlated with RMET ( $r = - 0,323$ ;  $p = 0,039$ ). Except from this correlation, FIQ seemed to not significantly correlate with other social cognition and attachment parameters except of female faces in RMET. Correlation of task scores between each other are shown in Table 3.

### **Discussion**

In this current study we aimed to examine social cognitive and attachment profiles of FMS patients. Our findings showed that although as a group FMS patients have similar ToM abilities in means of RMET performances and empathic abilities in comparison to healthy subjects, they do differ in means of attachment profiles, as FMS patients had significantly higher scores in attachment avoidance.

In the literature there are various studies consistently showing insecure attachment styles of FMS patients. It is shown that insecure attachment can be defined as a

predisposing factor for chronic pain as well as a mediator between chronic pain and perception of pain like catastrophizing, difficulties in coping with pain, depression and anxiety (21). In this current study no difference found between FMS patients and healthy controls in means of secure/ insecure attachment dichotomy. However only 15 of 41 FMS patients showed a secure attachment style when the ECR-R scores assessed categorically. Relatedly our healthy control group also showed high numbers of subjects with insecure attachment with a ratio of 13 secure to 31 insecurely attached subjects. It is known that secure attachment is highly related to social support seeking behavior (21) and this finding may explain development of anxiety and depression through low perceived social support in insecurely attached FMS patients (11).

Our finding may be discussed in comparison with Govender et al.'s study, as they also found that FMS patients show more avoidant type and less anxious type of insecure attachment compared to general population (10). However there are several studies showing increased rates of both types of insecure attachment in FMS patients (12). Our finding of dissociation of avoidant and insecure types in FMS patients may be caused from also high attachment anxiety scores in control subjects and the type of measure to assess attachment, as there are various discussions on how to measure attachment in categorical or continuous dimensions. As one of the main findings from the current study, we want to emphasize the role of attachment insecurities in FMS patients in the light of relatively recently developed attachment based psychotherapies, as studies showing that the relevant psychotherapeutic interventions in patients with insecure attachment can help to establish more secure attachment relationships (22). Such interventions can also be adapted to FMS

patients with insecure attachment and may help to diminish difficulties in pain perception, perception of illness and seeking social support (23).

Findings from the current study showed that although as a group FMS patients have similar ToM abilities in means of RMET performances with healthy controls, severe patients with FIQ scores higher than 70 perform significantly worse in RMET-Females subcategory compared to FMS patients with FIQ scores lower than 70. The similar results of both groups must be discussed in the light of other studies using RMET in Turkish population. Compared to these studies, participants of both FMS and health control groups in the current study performed below average in RMET. In this regard, we can postulate that although FMS patients showed poor performance in RMET, it may be effected mostly from socio-demographic statuses, specifically education levels of the patients (16).

More detailed analysis of RMET scores in the current study revealed that FMS patients with high FIQ scores show poorer ToM abilities in female faces of RMET compared to patients with low FIQ scores. This finding may be discussed in line with better ToM abilities of healthy women compared to men, a well-known phenomenon. Although number of subjects in this comparison were limited to conclude any firm relationship, we may speculate that ToM abilities of FMS patients incline to deteriorate with increased severity of FMS symptoms.

Empathy and ToM are two concepts regarded as closely related social brain functions and share common neural networks and brain structures. Similar to ToM findings in current study, there has been found no significant difference empathic abilities of FMS patients and

healthy subjects. This finding is in line with findings from the only study up today on empathic abilities of FMS patients, as Di Tella et al also found that FMS patients did not differ from healthy subjects in means of empathic abilities (7). As two closely related concept, we believe that our finding of similar ToM and empathy performances of FMS patients and healthy controls deserves special attention and may indicate that overall social cognitive function is preserved in FMS patients without history of psychiatric disorders.

One of the strengths of current study is that all tasks and clinical interviews were conducted by the same clinician to minimize risk of bias. Moreover, to our knowledge this is the first study to investigate social brain parameters like ToM and empathy with attachment, two highly related concepts in highly homogeneous samples of patients and healthy controls free of psychiatric disorders.

One of the main limitations of current study is the sociodemographic parameters of participants. Our patient and control group consisted of only female subjects, the level of education was relatively low and the patients were recruited from Physical Medicine and Rehabilitation outpatient clinic in a university hospital and these three factors may limit the generalization of our findings in primary care settings. In addition, lack of any objective measures to assess depression and anxiety levels of FMS patients may cause inclusion of participants with depression or anxiety, although diagnosis of such conditions was tried to be excluded with clinical interview.

## **Conclusion**

Management of chronic diseases constitutes one of the main all-day practices in primary care. Although they are defined as mostly benign conditions, chronic pain syndromes are regarded as difficult to treat and manage. FMS, as one of these chronic pain syndromes, is diagnosed more frequently in primary care settings and has a substantial impact on daily activities and functionality of affected individuals. Studies show that FMS have more negative impacts on economic load on individuals and health care than rheumatological disorders like ankylosing spondylitis (24). Like other chronic health conditions, patient-centred approaches are becoming more important in management of FMS. This approach requires to focus more specifically on psychosocial functioning of patients and adapt treatment modalities in these dimensions. Social cognition and attachment are two important social brain parameters, which are subjects of various psychosocial interventions. We believe that profiling of such parameters more specifically in FMS can offer more efficient diagnostic and treatment tools to clinician and may improve therapeutic relationship between patient and health care workers.

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