Research Article

Comparison of Fibromyalgia Severity in Mothers of Children with Autism Spektrum Disorders (ASD) and Mothers of Children without Psychiatric Disorders

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Abstract

Objectives: Long-term fibromyalgia syndrome (FM) causes widespread pain, sensitivity, fatigue, trouble sleeping, and cognitive issues. FM has no known cause despite extensive research. In this study, we looked at how bad fibromyalgia was in mothers of children with autism spectrum disorder (ASD).

Methods: Gülhane Training and Research Hospital conducted this study. In the study, 40 children aged 6–10 were diagnosed with ASD in the child psychiatry department. The paediatric and outpatient clinic had 40 healthy controls without psychiatric disorders. The Beck Depression Scale, the Beck Anxiety Scale, the Fibromyalgia Effect Survey, and the Autism-Spectrum Questionnaire (ASQ) were used to test the mothers of the children in the study for depression, anxiety, the severity of their fibromyalgia, and autistic symptoms.

Results: The clinical severity of ASD symptoms has been measured (CARS) using the Childhood Autism Rating Scale. ASD, fibromyalgia, ASQ, and CARS patients score higher than healthy people. There were no statistically important differences between the depression and anxiety scores of the healthy and ASD groups.We examined fibromyalgia severity in 40 age- and gender-matched mothers of children with ASD and 40 mothers of healthy children without psychiatric illness.

Conclusion: Mothers of children with ASD had higher rates of fibromyalgia than mothers of healthy children.

Keywords: Autism spectrum disorder (ASD), Fibromyalgia, Mothers, Psychiatric disorders, Severity

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A chronic condition known as fibromyalgia syndrome (FM) is characterised by widespread body pain, sensitivity, exhaustion, sleep disorder, and cognitive dysfunc-tion.[1] In addition, certain symptoms or syndromes, such as irritable bowel syndrome, chronic headache, depression, anxiety, restless leg syndrome, temporomandibular dys-

function, chronic fatigue syndrome, and irritable bladder syndrome, may also accompany.[2] After osteoarthritis, fibromyalgia is the rheumatic condition that affects the most people. Its prevalence ranges from 2% to 8%, although this number can change depending on the diagnostic criteria. [3] In a study that was carried out in Turkey on women ranging in age from 20 to 64 years, it was discovered that the prevalence was 3.6%.[4] Despite the extensive research that has been done, the cause of FM is still unknown. There was an 8.5 times higher prevalence of it among patients' first-degree relatives than there was among the general population.[5] Studies on twins have shown that heredity is only responsible for half of the risk of developing FM or one of the other central sensitivity disorders.[6] It would appear that psychiatric conditions have a significant impact on fibromyalgia. Patients diagnosed with fibromyalgia are more likely to suffer from psychological disorders compared to patients diagnosed with other rheumatic illnesses.[7] The most common disorders associated with FM are anxiety, somatization, dysthymia, panic disorders, post-traumatic stress disorder, stress overload, and depression.[8]

Autism Spectrum Disorders (ASD) are a group of neurodevelopmental disorders that cause restricted behavioural patterns and make it more difficult to interact with others. [9] ASD causes serious social, academic, and psychological problems for children and adolescents at all stages of development. These issues can make it more difficult to get along with others and your family, and they can also be detrimental to your mental health.[9]

The absence of reciprocity in social interactions is one of the main traits of autism. A theory of mind (ToM), also known as having a Theory of Mind or Mentalization capacity, is the capacity to recognise that individuals other than oneself (others) have minds that differ from one's own, to understand the mental states of oneself or others, such as intentions, beliefs, wishes, and knowledge, and to mentally represent them.[10] A subgroup of people with moderate autistic symptoms is known as the Broad Autism Phenotype (BAP), and it is believed that members of this subgroup also have subthreshold social-communicational symptoms, deficiencies in Theory of Mind, and odd personality traits. It frequently occurs in families of children who have neurodevelopmental issues like ASD and ADHD.[11] This may make parents of children with ASD and ADHD more prone to FM syndrome.

There is a connection between FM syndrome and high levels of stress, anxiety, and depression. Children who have autism spectrum disorder are more likely to exhibit autistic traits and to have a more varied autism phenotype. Because of this, parents whose children have ASD may be at a higher risk of developing FM syndrome themselves. Because of the increased stress burden that ASD imposes on the family and BAP, which is likely to be present in the families of children with ASD, we believe that the severity of fibromyalgia will be higher in the families of the ASD group compared to the families of healthy controls. This belief is based on the fact that the severity of fibromyalgia will be higher in the families of the ASD group.

To the best of our knowledge, this is the first study evaluating fibromyalgia severity in families of ASD and healthy children.

Methods

Samples

The research was carried out at the Gulhane Training and Research Hospital. The study involved a sample of 40 children, ranging in age from 6 to 10 years, who were hospitalised in the child psychiatry department and diagnosed with Autism Spectrum Disorder (ASD) for the first time. Additionally, 40 healthy controls who were admitted to the paediatrics polyclinic and exhibited no psychiatric issues were also included in the research. The study's control group comprised of paediatric patients aged 6 to 10 years who were in good health and had been referred to the hospital for a standard medical assessment. These patients were sourced from the same academic institution's paediatrics polyclinic. Exclusion criteria for the study involved patients who presented with significant psychiatric comorbidities such as temporary impairment, bipolar disorder, and schizophrenia, as well as those who had experienced active infection within the previous month, metabolic disorders, autoimmune diseases, and endocrinological and neurological disorders. The cohort designated as the control group was comprised of individuals who volunteered for the study and were deemed to be in a state of good health. Identical exclusion criteria were applied to both the healthy children and the case group. The findings revealed that a significant proportion of children diagnosed with Autism Spectrum Disorder (ASD) were accompanied by their mothers during the application process. Therefore, the research was planned to solely involve mothers. The research comprised a sample of 40 women who have children diagnosed with Autism Spectrum Disorder (ASD) and another 40 mothers who have children without any known health conditions. Mothers who were diagnosed with an additional chronic illness were not included in the study. The study involved voluntary participants and their families, and the procedures were conducted in accordance with the guidelines set forth by the local ethics committee and approved by the Gulhane Training and Research Hos-

pital. Upon being informed about the study, written consent was obtained from the parents of the children.

Diagnosis and Symptom Assessment

The researchers administered a questionnaire to the participants, which included inquiries regarding sociodemographic and clinical information. The K-SADS-PL, which stands for Schedule for Affective Disorders and Schizophrenia for School-Age Children, Current, and Lifetime Version, was administered to both the child in question and their parent, as reported in reference.[12] The K-SADS-PL-DSM-5 was employed by a psychiatrist to assess psychiatric disorders in healthy controls subsequent to a physical examination conducted by a paediatrician. The K-SADS-PL-DSM-5 is a tool utilised to screen for mood disorders and schizophrenia in school-aged children, both currently and over their lifetime.

The study utilised the Beck Depression Scale,[13] Beck Anxiety Scale,[14] Fibromyalgia Effect Survey,[15] and Autism-Spectrum Questionnaire[16] to evaluate depression symptoms, anxiety symptoms, fibromyalgia severity, and autistic symptoms in the mothers of the study's participating children.

The clinical severity of Autism Spectrum Disorder (ASD) symptoms has been assessed through the application of the Childhood Autism Rating Scale (CARS). According to a study conducted by,[17] the Turkish population considers CARS to be a trustworthy and reliable source. The assessment tool comprises 14 distinct domains that evaluate behaviours associated with autism, and 15 metrics that provide a comprehensive interpretation of autism. The rating system for each scale ranges from 1 to 4. The severity of degeneration increases proportionally with higher numerical values. The range of total points spans from 15 to 60, and scores that are less than 30 signify that the individual does not lie within the autistic spectrum. The range of scores from 30 to 36.5 is indicative of mild to moderate autism, while scores ranging from 37 to 60 are indicative of severe autism. The psychometric properties of CARS have been thoroughly documented.

Statistical Analysis

The statistical package programme utilised for the analysis of the data was IBM SPSS Statistics Standard Concurrent User V 26 (IBM Corp., Armonk, New York, USA). The study provided descriptive statistics in the form of various measures including the number of units (n), percentage (%), mean±standard deviation (sd), median (M), minimum (min), maximum (max), and interquartile range (IQR) values. The Shapiro-Wilk normality test was utilised to assess the normal distribution of the numerical variables. The Levene test was utilised to assess the homogeneity of variances. In the case of numerical variables, group comparisons were conducted using the independent samples t-test if the data exhibited normal distribution, and the Mann-Whitney U test if the data did not demonstrate normal distribution. The Chi-square statistical method was utilised to conduct comparisons between groups with categorical variables. The Spearman correlation coefficient was utilised to assess the correlations among the scale scores. After controlling for BAS and BDS, a partial correlation analysis was conducted to assess the association between OSA and FS scores. A one-way covariance analysis was conducted to compare FS scores between individuals with ADHD and a healthy control group. The analysis was adjusted for OSA, BDS, and BAS. A significance level of $p<0.05$ was deemed statistically significant.

Results

There were 80 individuals in the study, 40 in the healthy group, and 40 in the ASD group, as shown in Table 1. 13 (32.5%) females made up the healthy group, whereas 6 (15.0%) did so in the ASD group. The gender distributions of the groups did not differ statistically from one another. The children ranged in age from 67 to 132 months, and there was no statistically significant difference in age between the groups. The mothers' ages in the groups did not differ significantly. In the healthy group, 23 mothers (57.5%) and in the ASD group, 21 mothers (52.5%) had high school diplomas. The mothers' educational backgrounds did not statistically differ across the groups. In the healthy group, there were 6 (15.0%) moms who participated in sports; in the group with ASD, there were 12 (30.0%). Twelve moms (30.0%) in the healthy group and nine (22.5%) of the ASD group were smokers. Smoking and participation in sports by mothers did not differ significantly across the groups. Table 1 shows that patients with ASD' Fibromyalgia, ASQ, and Cars scores are statistically greater than those of the healthy population. There were no statistically significant differences between the healthy and ASD groups' beck depression and anxiety scores.

The findings presented in Table 2 indicate that there exists a statistically significant positive correlation between the fibromyalgia score and the ASQ and Cars scores, while a weak positive correlation is observed between the fibromyalgia score and the Beck Anxiety score for the entire group. The study findings indicate a weak correlation between ASQ scores and Beck anxiety scores, whereas a moderate correlation was observed between ASQ and Cars scores. There exists a positive correlation of weak strength between Beck depression and Beck anxiety. The study found a statistically insignificant positive correlation between the fibromyalgia

Table 1. Comparisons between groups

| | Groups | | Test Statistics | |
	Healthy n=40	ASD n=40	Test Value	p
Gender n (%)				
Male	27 (67.5)	34 (85.0)	3.382[&]	0.114
Female	13 (32.5)	6 (15.0)		
Age (month)				
M (min-max)	84.0 (67-120)	92.5 (72-132)	1.444[‡]	0.149
Mother's age (year) Mean±SD	34.8±4.7	35.5±4.7	0.687[†]	0.494
Mother's education level, n (%)				
Secondary	7 (17.5)	4 (10.0)	1.883[&]	0.404
High School	23 (57.5)	21 (52.5)		
University	10 (25.0)	15 (37.5)		
Mother does Sport, n (%)				
Yes	6 (15.0)	12 (30.0)	2.581[&]	0.180
No	34 (85.0)	28 (70.0)		
Smoking, n (%)				
Yes	12 (30.0)	9 (22.5)	0.581[&]	0.612
No	28 (70.0)	31 (77.5)		
Fibromyalgia Score, M (IQR)	29.5 (16.0)	42.0 (15.0)	**4.922[‡]**	**<0.001**
ASQ Score, M (IQR)	18.0 (5.0)	23.0 (7.0)	**4.428[‡]**	**<0.001**
Beck Depression Score, M (IQR)	13.0 (6.0)	12.0 (6.0)	1.010[‡]	0.312
Beck Anxiety Score, M (IQR)	13.0 (6.0)	13.0 (8.0)	0.208[‡]	0.836
CARS	19.0 (5.0)	40.0 (18.0)	**7.715[‡]**	**<0.001**

SD: standard deviation; M: median; IQR: interquartile range; [‡]Mann–Whitney U test; [&]chi-square test; [†]Independent samples t-test.

Table 2. Correlations between scores in the whole group, healthy group, and ADHD group

| | Whole Group | | | | Healthy Group | | | | ASD Group | | | |
	OSAS	BDS	BAS	CARS	OSAS	BDS	BAS	CARS	OSAS	BDS	BAS	CARS
FS												
rho	**0.698**	-0.123	**0.344**	**0.625**	**0.539**	-0.128	0.291	0.092	**0.761**	-0.029	**0.495**	**0.662**
p	**<0.001**	0.277	**0.002**	**<0.001**	**<0.001**	0.431	0.069	0.572	**<0.001**	0.858	**0.001**	**<0.001**
ASQ												
rho	-	-0.109	**0.244**	**0.574**	-	-0.035	0.171	0.034	-	-0.049	**0.414**	**0.670**
p	-	0.337	**0.029**	**<0.001**	-	0.828	0.291	0.835	-	0.763	**0.008**	**<0.001**
BDS												
rho	-	-	**0.380**	-0.045	-	-	0.270	0.166	-	-	**0.457**	0.050
p	-	-	**0.001**	0.691	-	-	0.092	0.306	-	-	**0.003**	0.759
CARS												
rho	-	-	0.098	-	-	-	0.091	-	-	-	**0.372**	-
p	-	-	0.388	-	-	-	0.575	-	-	-	**0.018**	-

FS: Fibromyalgia Score; ASQ: ASQ Score; BDS: Beck Depression Score; BAS: Beck Anxiety Score.

score and the ASQ score in the healthy group.

The study found a significant positive correlation between the fibromyalgia score and the ASQ and Cars scores, as well as a moderate positive correlation with the Beck Anxiety

score, within the ASD group. The results indicate that there exists a moderate positive correlation between ASQ scores and the Beck anxiety score, as well as a good positive correlation between ASQ scores and Cars score. A moderate

positive correlation has been observed between Beck depression and Beck anxiety. A weak positive correlation with low statistical significance has been observed between the scores obtained from the Cars assessment and the Beck anxiety inventory. The remaining correlation coefficients presented in Table 2 do not exhibit statistical significance

Discussion

Fibromyalgia (FM) is a medical condition characterised by persistent and diffuse musculoskeletal pain that affects multiple areas of the body.[18] Fibromyalgia (FM) symptoms encompass a diverse array of grievances, such as hyperalgesia and allodynia, physical and mental exhaustion, compromised or insufficient sleep, cephalalgia, irritable bowel syndrome, psychiatric ailments, cognitive dysfunction, and additional functional complaints.[19] The precise origin of this syndrome remains uncertain, however, intricate interplays among biological, genetic, psychological, and sociocultural elements, including medical afflictions, neuroendocrine maladies, stress, and psychiatric conditions, seem to hold significance. Elevated levels of stress and psychiatric symptoms have been found to exert adverse effects on the perception of disease severity, functional capacity, pain threshold, and tolerance, as reported in reference.[19]

A significant incidence of depression ranging from 20% to 80% and anxiety disorders ranging from 13% to 64% have been extensively documented among psychological factors.[20] The investigation of emotional functioning in FM syndrome has only been initiated by researchers in recent times, with a particular focus on alexithymia. This is a multifaceted personality trait that impacts an individual's ability to regulate their own emotions.[21] Alexithymia is a condition that is marked by challenges in recognising and articulating personal emotions, difficulty in distinguishing between emotions and physical sensations associated with emotional arousal, restricted imaginative processes, and a cognitive style that is reliant on external stimuli. This has been documented in previous research. The findings of most of these studies suggest that individuals diagnosed with FM exhibit heightened levels of alexithymia, which is indicative of deficient emotional self-awareness. As far as current literature is concerned, only a single study has investigated the capacity to recognise the emotional states of individuals with FM syndrome.[22] The study's findings indicate that individuals diagnosed with FM exhibited inferior performance on the facial recognition task in comparison to the healthy control group. Additionally, a higher percentage of misidentified emotional expressions were observed in the FM group. Furthermore, the study found that recognition performance was inversely correlated with pain intensity, alexithymia, depression, and anxiety.

However, there was no discernible impact on performance from psychiatric comorbidity or medication.

Theory of mind (ToM), also known as having a Theory of Mind or Mentalization capacity, is the ability to comprehend that people (others) other than oneself have a mind that is distinct from one's own, as well as to comprehend and mentally represent one's own or others' intentions, beliefs, wishes, and knowledge.[10] The symptoms of children with autism spectrum disorders were initially explained in terms of psychopathology using theory of mind disorders. The term "Broad Autism Phenotype" (BAP) refers to a subgroup of people who are thought to exhibit subthreshold social skills communication symptoms, deficits in theory of mind, and unusual personality traits in addition to mild autism symptoms. It is frequently observed in families of kids with neurodevelopmental disorders like ASD and ADHD.[11]

This study aimed to investigate the severity of fibromyalgia among a sample of 40 mothers of children with Autism Spectrum Disorder (ASD) who were age and gender-matched with 40 mothers of healthy children without psychiatric illness. This research represents the initial investigation in the existing body of literature to explore the correlation between these variables. The statistical analysis revealed that the severity of fibromyalgia was higher in mothers of children with ASD in comparison to mothers of healthy children. The severity of fibromyalgia may be influenced by factors such as the age and educational attainment of the mother, as well as her engagement in physical activity and smoking habits. The study did not reveal any statistically significant differences between mothers of children with ADHD and mothers of healthy children with respect to the age of the mothers, their educational level, their engagement in sports, and their smoking habits.

In order to comprehend the underlying factors contributing to this outcome, an assessment was conducted on the depressive, anxious, and autistic traits exhibited by both cohorts. The emergence of fibromyalgia is believed to be significantly influenced by psychiatric disorders. According to research, patients with fibromyalgia exhibit a greater incidence of psychiatric disorders compared to those with other rheumatic diseases.[23] The severity of fibromyalgia has been found to be linked to depression and anxiety disorders.[24] The results of our study indicate that there was no statistically significant difference observed between the two groups with respect to their depression and anxiety scores.

Patients with FM have trouble controlling their own emotions, recognising other people's emotions, and imagining how other people are feeling.[21] Broad Autism Phenotype (BAP) is a term for a group of people who are thought to have mild autism symptoms and subthreshold social skills-

communication symptoms, Theory of Mind deficits, and unusual personality traits. It is often seen in families where someone has a neurodevelopmental disorder like ASD or ADHD.[11] People in the families of these children have trouble recognising and naming their emotions, and they also have much higher levels of alexithymia.[25]

Our study involved a comparison of the symptoms of autism in mothers with children diagnosed with ASD versus those of mothers with typically developing children. The study revealed a statistically significant increase in autistic symptoms among mothers of children diagnosed with ASD in comparison to mothers of neurotypical children. It is hypothesised that the severity of fibromyalgia is more pronounced in mothers of children with autism compared to mothers of neurotypical children. The Childhood Autism Rating Scale (CARS) was employed to evaluate the level of autism severity among the subjects who participated in our investigation. There was a statistically significant positive correlation between the fibromyalgia score and the OSA and Cars scores in the ASD group. There exists a significant positive correlation between the OSA and Cars scores. The results suggest that there is a positive correlation between the severity of autism in children with ASD and the severity of fibromyalgia symptoms in their mothers.

The stress burden experienced by families with children diagnosed with Autism Spectrum Disorder (ASD) is comparatively higher than that of families with typically developing children, as indicated by previous research.[26] Individuals who experience a greater degree of stress exhibit elevated scores for fibromyalgia severity, as per previous research.[27] It is posited that the augmented severity of fibromyalgia in mothers of children with Autism Spectrum Disorder (ASD) in comparison to mothers of neurotypical children may be attributed to an excessive burden of stress.

There were a few problems with this study. To begin, this investigation is what's known as a cross-sectional study. The second issue is the limited size of the sample. As a result, the current study is the first study to evaluate the severity of fibromyalgia in families who have children with ASD as well as children who are not affected by the disorder. More research with larger sample sizes is required in order to get a clearer picture of what caused the problem.

Disclosures

Ethics Committee Approval: This study complies with the Declaration of Helsinki. The study was approved by the Gülhane Training and Research Hospital Ethics Committee (No: 2022-320). All participants were informed about the research protocol and signed a written consent and declared their voluntary participation.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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