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AUTISTIC SYMPTOMS IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

DİKKAT EKSİKLİĞİ HİPERAKTİVİTE BOZUKLUĞU OLAN ÇOCUKLARDA OTİSTİK BELİRTİLER

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Abstract

The aim of this study is to detect the prevalence of autistic symptoms of children with attention deficit hyperactivity disorder (ADHD) using Autism Behavior Checklist (ABC). The sample of this study included 51 children (42 males, 9 females) at 8-18 ages diagnosed with ADHD in psychiatry and child psychiatry clinics of University Research and Education Hospital between 01/03/2016 - 31/05/2016 and 58 controls (48 males, 10 females) without ADHD with similar age, sex, and education features. Results showed higher results for children with ADHD in total ABC scale and all of its 5 subscales than children without ADHD ($p<0.001$). The rate of ADHD diagnosis in first degree relatives of children with ADHD was significantly higher than relatives of the control group ($p<0.001$). Another finding of the study was lower employment rate in the mothers of the ADHD children compared with the mothers of the control children ($p=0.023$). The most important finding of this study was that in the patient group, the score of the ABC scale and the score of each subscale were significantly higher than the control group. This conclusion suggests that children with ADHD may have symptoms that may disrupt social functions such as communication problems. It also points out that children with ADHD should be addressed in this respect too.

Keywords: attention deficit hyperactivity disorder; autistic symptoms; autism behavior checklist; ASD; ADHD

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Öz

Bu çalışmanın amacı, Dikkat Eksikliği Hiperaktivite Bozukluğu (DEHB) olan çocuklarda otistik belirtilerin yaygınlığının Otizm Davranış Kontrol Listesi (ABC) ile araştırılmasıdır. Araştırmanın örneklemini, Üniversitemiz Eğitim ve Araştırma Hastanesi psikiyatri ve çocuk psikiyatri polikliniğine 01/03/2016- 31/05/2016 tarihleri arasında başvuran 8-18 yaş aralığındaki DEHB tanısı almış 42 erkek, 9 kız olmak üzere 51 kişi ve yaş, cinsiyet, eğitim düzeyi bakımından benzer olan, DEHB olmayan 48 erkek, 10 kız olmak üzere 58 kişi oluşturmaktadır. Elde edilen bulgularda DEHB'li bireylerin ABC ölçeğinden almış oldukları toplam ölçek puanı ve alt ölçek puanları DEHB'li olmayan bireylere kıyasla daha yüksek bulunmuştur (p<0.001). DEHB'li bireylerin birinci derece akrabalarında DEHB görülme olasılığı kontrollere kıyasla daha yüksek bulunmuştur (p<0.001). Elde edilen başka bir bulgu ise; çalışmamıza dâhil edilen DEHB'li çocukların annelerinin kontrol grubu annelerine kıyasla daha az çalıştığı tespit edilmiştir (p=0.023). Bu çalışmanın en önemli bulgusu hasta grubunda ABC ölçeğinin toplam puanı ve alt ölçeklerin her birinin puanının kontrol grubuna göre anlamlı olarak yüksek çıkmasıdır. Bu sonuç, DEHB'li çocuklarda iletişim sorunları gibi sosyal işlevleri bozabilecek belirtiler olabileceğini düşündürmektedir. DEHB'li çocukların bu açıdan da ele alınması gerektiğine işaret etmektedir.

Anahtar Kelimeler: *dikkat eksikliği hiperaktivite bozukluğu; otistik belirtiler; otizm davranış kontrol listesi; ASB; DEHB*

1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder that occurs in 3% to 5% of school-age children. It is found in every one of 20 children, or it can be stated theoretically that there is one child with ADHD in every class (Brown, 2000; Kara & Orum, 2018). Studies have shown that children with ADHD are more susceptible to anxiety disorders, mood disorders, and alcohol-substance use disorders (Torgersen et al., 2006; Ozen et al., 2018; Orum et al., 2018). At the same time, it was seen that children with ADHD had less self-esteem than their peers. Children with ADHD have been found to have problems with social relationships because they have low social skills. In addition to the lack of social skills, children with ADHD have been found to have difficulty coping with challenging life events (Babb et al., 2010; Schuck et al., 2018).

Autism Spectrum Disorder (ASD) is a complex neurological deficit at the advanced level (Landa, 2007; Urbano et al., 2019). Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) defines ASD as persistent deficits in social communication and social interaction across multiple contexts, restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013). When children with ASD were compared with normal-growing children, it was seen that children with ASD experienced limitations in social interaction and cognitive development, had delays in language and motor development, had unusual characteristics, and had difficulty playing games appropriately (Landa, 2007).

ADHD and ASD are two disorders under the heading of neurodevelopmental disorders in DSM-5 (American Psychiatric Association, 2013). Despite the fact that the ASD and ADHD differ in the core indications, there are many areas where the two disorders overlap. Studies conducted in recent years have reported an increased frequency of autistic symptoms in children with ADHD (Gradzinski et al., 2011; Kotte et al., 2013). ADHD symptoms were seen in 30-50% of children with ASD. Approximately two of three children with ADHD have ASD symptoms (Davis & Kollins, 2012). Attention deficit, lack of social skills, impulsivity, restlessness, and hyperactivity have been shown to be overlapping features for these two disorders (Wing et al., 2011; Miller et al. 2018). In addition, ADHD comorbid diagnoses were found to be higher in children with ASD (Yoshida & Uchiyama, 2004).

The demonstration of similarities between ASD and ADHD will facilitate the investigation of the etiology of both disorders. In terms of classification systems, these two disorders coexist under the heading of neurodevelopmental disorders in DSM-5. Showing similarities between these two disorders will also be helpful in terms of classification. The display of autistic symptoms in children with ADHD may change the treatment approaches of these children and may increase their approach to improving social skills. In this study, the prevalence of autistic symptoms in children with ADHD was investigated using the Autism Behavior Checklist (ABC).

2. Material and Methods

2.1. Study Design and Participants

Design of this study was a case-control study. The universe of this study was patients with ADHD who admitted to psychiatry and child and adolescent psychiatry departments of our hospital (between 01/03/2016-31/05/2016). The sample of the study consisted of a group of patients (42 males, 9 females) who were admitted to our hospital psychiatry and child psychiatry outpatient clinic between 8-18 years of age. Subjects (48 males, 10 females) who were similar in terms of gender, age, education level within the same dates were selected as the control group. The patient group consisted of people diagnosed with ADHD according to DSM-5 (Amerikan Psikiyatri Birliği, 2014). However, a new scale was not applied to ADHD for the patient group and ADHD severity was not differentiated. The healthy control group was selected from relatives of hospital staff. Parents filled the Conners Parent Rating Scale (CPRS) (Dereboy et., 2007) and ADHD patients in the control group were excluded from the study. To evaluate the rate of ADHD diagnosis in first degree relatives of children with ADHD and control, we have used the Turkish version of the Adult ADHD Self-Report Scale (ASRS-v1.1). The meaningful expression of the test in one of the parents is considered as positive ADHD kinship.

These numbers are based on the power analysis of the study done by Kotte et al. (Kotte et al., 2013). This study was approved by the ethics committee of Adiyaman University Training and Research Hospital (Protocol number: 2016/1-13).

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2.2. Assessment

2.2.1. Sociodemographic Form

A form containing sociodemographic and clinical information was filled in by the researcher. Age, gender, education level, marital status, job, number of hospitalizations, additional psychiatric diagnosis, history of forensic prosecution, attempt to quit substance, alcohol-substance type were used as variables in the questionnaire.

2.2.2. Autism Behavior Checklist (ABC)

The Autism Behavior Checklist is one of the most commonly used measurement tools for autism screening and evaluation in recent times and has been briefly named as ABC. Turkish validity and reliability of ABC were performed by Irmak et al. (Tekinsay-Sütçü et al., 2007). ABC consists of five subscales that include 57 items. 9 items measure sensory subscale, 12 items measure establish relationship subscale, 12 items measure body and object use subscale, 13 items measure language skills, 11 items measure social and self-efficacy subscale. The highest score that can be taken from this scale is 159, the lowest score is 0. One of the most important advantages of this scale is that it is possible to obtain information from both teachers and parents (Krug et al., 1993).

2.2.3. Conners Parent Rating Scale (CPRS)

The Turkish adaptation study of the scale was done by Dereboy et al. (2007). The scale consists of a total of 48 items; There are 5 items under the attention deficit factor (ADF), 4 under the hyperactive factor (HF), 5 for the oppositional defiant disorder (ODD), and 11 for the conduct disorder (CD). The questions on the scale are answered by the parents on the 4-point Likert scale. "Never", "rarely", "often" and "always" options respectively; It is scored as "0", "1", "2" and "3". In this study, it was accepted that the subjects who took 5 points for ADF subscale, 6 for HF subscale, 7 for ODD subscale and 18 points for CD subscale in parallel with the proposed cut-off points were included in the problem area. In the present study, the analyzes were conducted on the total score of the scale.

2.2.4. Adult ADHD Self-Report Scale (ASRS-v1.1)

The Turkish adaptation study of the scale was done by Dogan et al. (2009). The scale consists of a total of 18 items and two sub-dimensions.

2.3. Statistical Analysis

Windows SPSS 21.0 program (Statistical Package for the Social Sciences Inc.) was used for statistical analysis. Mean, standard deviation, percent, and median were used as descriptive statistics. It was investigated by the Kolmogorov Smirnov test that the variables exhibited normal distribution (p> 0.05). Independent sample t-test was used to compare the parameters distributed normally. Mann-Whitney U test was used to compare the variables which not exhibit a normal distribution. In comparing categorical variables, the chi-square test was used. The statistical significance level was accepted as p<0.05 for all values. However, since the ABC test had 5 subscales and the scale total score and 5 subscale scores were analyzed separately, Bonferroni correction was performed.

3. Results

The identifier properties of the individuals are shown in table 1. There were no significant differences in terms of age, gender, marital status, and working status (p>0.05). The patient group consisted of 42 males (82.4%) and 9 (17.6) females. The control group consisted of 48 males

Table 1. Sociodemographic Data

	Patient		Control		p value
	n	%	n	%	
Gender					
Male	42	82.4	48	82.8	0.956
Female	9	17.6	10	17.2	
Working Status					
Yes	26	74.3	16	64.0	0.391
No	9	25.7	9	36.0	
Working Status of Mother					
Yes	10	19.6	23	39.7	0.023
No	41	80.4	35	60.3	
Working Status of Father					
Yes	47	92.2	55	94.8	0.570
No	4	7.8	3	5.2	
Economic Status					
Bad	8	15.7	9	15.5	0.517
Intermediate	29	56.9	28	48.3	
Good	12	23.5	20	34.5	
Very Good	2	3.9	1	1.7	
Family Interest					
Authoritarian	11	21.6	11	19.0	0.383
Democratic	13	25.5	20	34.5	
Irrelevant	0	0.0	3	5.2	
Extremely Relevant	11	21.6	11	19.0	
Protective	16	31.4	13	22.4	
Family Structure					
Parents Together	49	96.1	51	87.6	0.477
Father Dead	1	2.0	1	1.7	
Parents Separate	0	0.0	1	1.7	
Divorced	1	2.0	5	8.6	
Family History					
First Degree Kinship	12	23.5	0.0	0.0	<0.001
No Kinship	39	76.5	58	100.0	

	Mean ± SD	Mean ± SD	p value
Age	10.59±2.47	10.88±2.85	0.572
Education (Years)	4.62±2.55	4.98±2.88	0.500
Education of Mother	8.08±4.54	8.75±4.34	0.426
Education of Father	9.98±4.50	10.63±4.33	0.440

*p<0.05, Note: SD: Standard deviation

(82.8) and 10 (17.2) females. There was no significant difference between the genders (p=0.956). The age of the groups was found to be similar (p=0.572). There was no significant difference between the education levels of the groups (p=0.500). There was no significant difference between the educational levels of the parents of the groups (p=0.426 and p=0.440). In the control group, the mothers were observed to work at a higher rate compared to the patient group (p=0.023). There was no significant difference in the working status of these two groups of fathers (p=0.570). There was no significant difference in economic status between the two groups (p=0.517). Fisher's exact test was performed for comparison of both groups, and no significant difference was observed between the groups in terms of family interest (p=0.383). There was no significant difference in family structure between the groups (p=0.477). Individuals with ADHD had a higher likelihood of having ADHD in first-degree relatives (p<0.001).

Findings related to the total scale score and subscale scores of the patient and control groups on the ABC scale were shown in table 2 and the total score of the ABC scale in the ADHD group was higher than the control group (p<0.001).

Table 2. Comparison of the Patient and Control Groups in Terms of ABC Scale and Subscale Scores

		Mean	SD	Median	Minimum Point	Maximum Point	p value
ABC Scale Total Score	Patient	53.67	29.21	53.00	6.00	136.00	<0.001
	Control	11.67	10.53	9.50	0.00	53.00	
Sensory	Patient	8.00	5.75	8.00	0.00	26.00	<0.001
	Control	1.00	1.81	0.00	0.00	8.00	
Building Relationship	Patient	14.75	9.56	15.00	0.00	38.00	<0.001
	Control	3.74	4.30	3,00	0.00	22.00	
Body and Object Use	Patient	11.53	6.80	7.00	0.00	29.00	<0.001
	Control	1.98	3.05	0.00	0.00	13.00	
Language Skills	Patient	8.98	6.80	7.00	0.00	29.00	<0.001
	Control	1.03	1.59	1.00	0.00	10.00	
Social and Self-Care	Patient	10.41	4.76	10.00	2.00	20.00	<0.001
	Control	3.91	3.25	3.00	0.00	13.00	

4. Discussion

In this study, autistic symptom severity in ADHD subjects was compared with the control group. The age, gender, educational level of the child and education level of the parents were examined and it was seen that these variables were similar for both groups. Therefore, it can be said that the groups are comparable and therefore the differences between the groups reflect the effects of the disease.

The most important finding of this study was that the total score and subscales of the ABC scale in our patient group were significantly higher than the control group. Similar results have been seen in the studies conducted in the literature. Kotte and his colleagues (2013) used the Child Behavior Checklist and developed autistic trait identifiers by using the items of social problems, thought, and inwardness. According to the authors, only 18.7% of the children with ADHD and 0.87% of the children in the control group met these determinants and the difference was statistically significant (Kotte et al., 2013). In the study of Guzelhan et al. (2001), Autistic Disorder Symptoms Screening List (ADSSL) was used in the individuals with ADHD and seen that destructive behaviour and lack of attention were high, while there was no evidence of verbal communication. In our study, verbal skills subscales such as relationship building and language skill differed in the comparison of experimental and control groups. There was a significant difference between patient and the control group in terms of language skills and building relationship (Table 2). Güzelhan and his colleagues did not use the subscale related to verbal skills but evaluated it with one question and the sample size wes small. These can be the reasons for not finding a difference (Güzelhan et al., 2001). In a study conducted by Clark et al. (1999), the Autistic Criteria Checklist was used and 49 people, 47 males and 2 girls, participated in the study. As a result, 85.7% of children with ADHD were not aware of others' feelings, 81.6% had difficulty in establishing relationships with children from the same age group, and most of them showed social deficiencies such as those with ASD. In our study, it was seen that ADHD patients showed social insufficiency compared to controls. Parke et al. (2018) Stated that impaired social cognition in children with ADHD. Geurts and colleagues (2004) tested a total of 136 subjects, including 54 ADHD, 41 high-functioning autism, and 41 healthy subjects in terms of five main areas: blocking executive function, visual work memory, planning, cognitive flexibility, and verbal fluency. In children with ADHD, he found inadequacy in blocking and verbal fluency. In patients with high functioning autism, difficulties have been observed in other areas besides entrepreneurship and working memory. We have demonstrated an impairment in the subscale of body and object use in our results. Goulardins et al., (2017) stated that a separate body of literature attests to ways that motor problems can severely impact children's daily lives, as motor problems may occur in 30-50% of children with ADHD. As a result; nearly one of third of children with ADHD were found to match the indications used in the diagnosis of ASD.

The risk of having ADHD in first degree relatives of individuals with ADHD in the study was found to be

higher than in the control group. When we look at the studies related to this, it is seen that the findings obtained parallel to the findings of our study (Miller et al., 2018). In the study of Biederman et al. (1990), they showed that children with ADHD have 2- to 8-fold higher risk of ADHD in their siblings using the Diagnostic Interview for Children and Adolescents. Aydin et al. (2006) found that the parents of ADHD children and adolescents had higher ADHD symptoms than the control group. Guclu and Erkiran (2004) found the prevalence of adult ADHD as 6.8% in the families of children with ADHD. Castellanos and Tannock (2002) reported that in close relatives of ADHD individuals, the risk of having ADHD varied between 10% and 35%, and the risk of being seen in siblings was about three times higher than in the normal population.

Mothers of children with ADHD who were included in the study were found to work less than control group mothers. This finding may indicate a two-way relationship between ADHD and the economic situation of the family. Considering the genetic transition of ADHD, it can be expected that the high incidence of ADHD is high in mothers because of the high level of ADHD symptoms and therefore difficulty in education and working life. On the other hand, it can be argued that because the economic situation of the family is relatively weak because the mothers do not work, and because the children are exposed to adverse environmental effects such as malnutrition, attention deficit symptoms are high. The economic situation perceived by their families was found to be similar. However, this does not mean that there is no real difference as it is subjective data. Because of the cross-sectional nature of our work, it is not possible to answer these questions about the relationship between the economic situation and ADHD. Long-term follow-up studies are needed to prove these hypotheses.

As a result; the most important finding of this study was that in the patient group, the score of the ABC scale and the score of each subscale were significantly higher than the control group. This conclusion suggests that children with ADHD may have symptoms that may disrupt social functions such as communication problems. It also points out that children with ADHD should be addressed in this respect too.

5. Limitations

The major limitation of this study is its cross-sectional design. A prospective design starting from early periods of substance use with regular follow-up scale evaluations would yield more convincing results about the nature of addiction. People with both attention deficit and hyperactivity were included in this study. Attention deficit and hyperactivity can be handled separately and the same study can be done. In the patient group, possible ASD diagnoses within the ADHD group were not investigated and not excluded from the study. Due to the frequency of ADHD-ASD association, ASD scores were high in some of the ADHD patients included in the study group. We did not investigate the diagnosis of ASD in these patients. This is another limitation of our study. In future studies, the diagnosis of ASD should be ruled out with a semi-structured interview when the autistic symptoms are screened in ADHD individuals. It is suggested that the same study should be performed with a larger sample group and with people with and without ADHD who live in different regions. Another limitation of our study is that the intelligence levels of the groups have not been measured. The inequality between the number of female and male subjects is another limitation of the study.

Competing interests

The authors declare that they have no competing interest.

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