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Is Aggression Uniform in Boys with ADHD?

Saldırganlık Tüm DEHB'li Erkek Çocuklarında Aynı Biçimde Midir?

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Abstract

The aim of this study is to evaluate the differences in aggression patterns in subtypes of ADHD. A total of 326 boys with ADHD and aggressive behaviors were included. Mean age of the patients was 9.95 ± 2.03 years. Aggressive behaviors were found to be significantly higher in ADHD+CD group, when compared to ADHD type and ADHD+ODD in all evaluation scales used. ADHD+ODD is more related with verbal aggressiveness, but ADHD+CD is generally related with more severe aggressive behaviors. ODD may predict the progression to more severe aggression and a diagnosis of CD in patients with ADHD.

Keywords: ADHD, aggression, conduct disorder (cd), oppositional defiant disorder (odd)

Öz

Bu çalışmanın amacı, DEHB alt tiplerinde saldırganlık biçimindeki farklılıkların değerlendirilmesidir. DEHB olan ve saldırgan davranışları olan toplam 326 erkek öğrenci çalışmanın örneklemini oluşturmaktadır. Çocukların yaş ortalaması 9.95 ± 2.03 şeklindedir. Saldırgan davranışların DEHB + DVB grubunda, kullanılan tüm değerlendirme ölçeklerinde DEHB ve DEHB + KOKGB tanı grupları ile karşılaştırıldığında anlamlı düzeyde daha yüksek olduğu saptanmıştır. DEHB + KOKGB, sözel saldırganlık ile daha fazla ilişkilidir, ancak DEHB + DVB genellikle daha şiddetli saldırgan davranışlarla ilişkilidir. KOKGB+ DEHB'li hastalarda görülen saldırgan davranışlar ciddi olarak ele alınmalıdır çünkü DVB tanısını yordamada önemli bir noktadır.

Anahtar Kelimeler: DEHB, davranım bozukluğu (dvb) karşıt olma karşı gelme bozukluğu (kokgb), saldırganlık

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1. Introduction

Attention deficit hyperactivity disorder (ADHD) is one of the most common psychiatric disorders of childhood, characterized by problems in attention, hyperactivity, and impulsivity. This well studied neurodevelopmental disease (Wolraich 1999, Rowland, Lesesne et al. 2002) has a worldwide prevalence of 5.9-7.1% in children and adolescents (Willcutt 2012), and recognized as an important public health issue all over the globe. Without proper diagnose and treatment, this disease causes a deteriorated academic and social life, and interferes with the normal development of children (Daley and Birchwood 2010, Stavrinos, Biasini et al. 2011).

Another important health concern in children is aggression, which can be defined in a wide spectrum of severity that ranges from bullying to violence and delinquency (Fingerhut, Ingram et al. 1998, Tremblay, Nagin et al. 2004). Although aggression is not necessarily reflect the presence of a psychiatric disorder and may be present in mentally healthy children (Polzer, Bangs et al. 2007), a substantial amount of medical and psychiatric conditions have to be excluded by detailed examinations to diagnose an isolated form of aggression (Turgay 2004). Even after an isolated diagnose of aggression, patients should be monitored closely for progression to a psychiatric disorder, because previous studies reported that aggression in childhood may be an early precursor of different problems such as depression, suicidal behaviors, violence, and substance abuse (Rivara, Shepherd et al. 1995, Nagin and Tremblay 1999).

Aggression is an important compound of some psychiatric disorders, particularly ADHD. Current data suggests that ADHD is one of the most prevalent psychiatric conditions in children referred for aggression (Polzer, Bangs et al. 2007). Reciprocally, children with ADHD exhibit high rates of aggression and antisocial behaviors (Hinshaw, Henker et al. 1989, Waschbusch, Willoughby et al. 1998). Aggression both has a deteriorating effect on the presentation and clinical course of ADHD, and it is also a deterministic factor for choosing the type of treatment (Connor, Chartier et al. 2010). Moreover, the primary outcome of ADHD treatment is generally reducing the aggression of children (King, Waschbusch et al. 2009). At this point, another important aspect of this clinical condition is the comorbidities of ADHD, because different types of aggression emerge in different subtypes of comorbidities in ADHD.

The most prevalent comorbid conditions in ADHD (Combined Type) are oppositional defiant disorder (ODD) and conduct disorder (CD). Current data suggests that presence of a diagnosis of ADHD increases the odds of ODD/CD roughly 10 times in general population (Angold, Costello et al. 1999), and also presence of comorbid ODD/CD increases the aggressive behaviors (Waschbusch 2002) in ADHD. Another interesting feature of comorbidity and aggression in ADHD is the discrimination in the type of aggressive behaviors if different comorbidities. According to previous studies, physical aggressive behaviors are more prominent in patients with ADHD+CD, and verbal aggression is more commonly seen in patients with ADHD+ODD (Harty, Miller et al. 2009). This finding suggests that in clinical evaluations, aggressive behaviors should be taken into consideration while keeping the clinical subtypes of the disorder in mind. But unfortunately most of the clinical studies, even including the most comprehensive ones such as MTA study (Jensen 2001), evaluated the ADHD patients with both ODD and CD (ODD/CD). Despite the fact that ADHD is one of the most studied disorders of childhood, the aggression in different subtypes of comorbidities still remains unclear. In this study, we evaluated the differences of aggressive behaviors in patients with ADHD, ADHD+ODD and ADHD+CD separately for a better understanding of clinical view that may provide an insight to more tailored treatments in children with ADHD. This study will make an important contribution to its field of interest. Because, the number of studies conducted in children with ADHD under psychological counseling and education is limited. Secondly, this study will help to define the difference of aggressive behaviors in children with ADHD and comorbid ODD, CD.

2. Material And Method

Participants

This study included a total of 326 boys with a mean age of 9.95 ± 2.03 years. ADHD, ADHD+ODD, and ADHD+CD groups included 81 (24.8%), 61 (18.7%), and 184 (56.4%) patients, respectively. Groups were similar for age distribution ($p=0.658$). The median number of the siblings of the patients was 1 (0-4), and median number of the household was 4 (2-9). There was no statistically significant difference between groups regarding number of siblings ($p=0.827$) and households ($p=0.162$).

Procedures

The study population selected from elementary school children with aggressive behaviors and referred to Disruptive Behaviors Clinic of Ege University Faculty of Medicine, Department of Child and Adolescent Psychiatry in 2011. For

a diagnosis of ADHD, a two-step procedure was utilized. In the first step, children were evaluated by a senior Child and Adolescent Psychiatry Resident using Schedule for Affective Disorders and Schizophrenia for School Aged Children: Present and Lifetime version (K-SADS-PL), Wechsler Intelligence Scale for Children-Revised (WISC-R), Children's Aggression Scale-Parent and Teacher Versions (CAS-P, CAS-T), Teacher Report Form (TRF), and Turgay DSM-IV Disruptive Behavior Disorders Rating Scale (T-DSM-IV-S) parent and teacher forms. Children who had IQ scores lower than 70 in WISC-R, and children who had scores less than one standard deviation below the relevant age norms on the Attention Deficiency and Hyperactivity Disorder subscales of T-DSM-IV-S were excluded from the study. In the second step of the analyses, a Child and Adolescent Psychiatry Professor experienced in ADHD and blinded to diagnostic assessments in the first step of the study evaluated the children. In the final evaluation of these children, all the scales used were considered together for a "best estimate" of ADHD subtype diagnosis. The ethical committee of Ege University Faculty of Medicine approved this study, and informed consents were obtained from the parents.

Measures

K-SADS-PL

The K-SADS-PL is a highly reliable semi-structured interview for the assessment of a wide range of psychiatric disorders which was translated and adapted into Turkish by Gokler (Gokler, Unal et al. 2004). K-SADS-PL consists of three parts: unstructured initial interview, diagnosis-oriented screening interview, children's global assessment scale. K-SADS-PL helps to determine the past and the present psychopathologies of children and adolescents.

T-DSM-IV-S

This scale was first developed by Turgay (Turgay 1994), and Turkish translation and adaptation was done by Ercan, Amado, Somer, & Cikoglu (Ercan, Amado et al. 2001). The T-DSM-IV-S is based on DSM-IV diagnostic criteria and assesses hyperactivity-impulsivity (9 items), inattention (9 items), opposition-defiance (8 items), and conduct disorder (15 items). Symptoms are scored by assigning a severity estimate for each symptom on a 4-point Likert scale (0 = not at all; 1 = just a little; 2 = quite a bit; and 3 = very much). The subscale scores on the T-DSM-IV-S were calculated by summing the scores on the items of each subscale.

CAS-P and CAS-T

These scales were both developed by Halperin et al. (Halperin, McKay et al. 2002, Halperin, McKay et al. 2003). Both the 33-item CAS-P and 23-item CAS-T require informants to indicate the frequency (i.e., never, once per month or less, once per week or less, 2–3 times per week, or most days) with which the child has engaged in various aggressive behaviors during the past year. Each test has five separate subscales: verbal aggression, aggression against objects and animals, provoked physical aggression and initiated physical aggression. CAS-P adapted into Turkish by Ercan et al. (2016) and CAS-T adapted into Turkish by Ulu (2018).

TRF

The TRF was first developed by Achenbach and Edelbrock (Achenbach and Edelbrock 1983) and adapted into Turkish by Erol, Arslan, & Akçakın (Erol, Aslan et al. 1995) for children 4–18 years of age and provides reliable and valid measures of the children's school adaptation and problematic behaviors.

Statistical Analyses

Numerical data were presented as mean \pm standard deviation. Inter-group comparisons between more than two independent groups were done by using one-way analysis of variances (ANOVA) test, controlling for the homogeneity of variances in Levene's test. When the variances are not homogenous, Welch ANOVA was used. If a statistically significant difference is determined in between-group comparisons, Tukey's test was used for post-hoc pairwise comparisons. If Welch ANOVA was used for multiple group comparisons, then Tamhane T2 test was used for post-hoc pairwise comparisons. A p value lower than 0.05 was considered as statistical significance. PASW v18 software was used for statistical analyses.

3. Results

Aggressive behaviors at home and school were evaluated by ODD and CD subscales of Turgay DSM-IV Based Child and Adolescent Behavior Disorders Screening and Rating Scale (T-DSM-IV-S) Parent and Teacher Forms. According to these evaluations all subscales showed significant differences between study groups, and ADHD+CD group had the

highest scores when compared to ADHD type and ADHD+ODD. The school evaluations showed similar results with the highest scores in ADHD+CD group, but aggression against objects did not revealed statistically significant differences between study groups. The evaluations of aggression at home and school were presented in Table 1.

Table 1. ODD and CD subscales of Turgay DSM-IV Based Child and Adolescent Behavior Disorders Screening and Rating Scale Parent and Teacher Forms.

	ADHD Mean±SD	ADHD+ODD Mean±SD	ADHD+CD Mean±SD	p	Pairwise Comparisons
Home					
Verbal aggression	9.41±9.64	11.45±8.98	14.21±10.47	0.003	3>1
Aggression against objects	1.55±1.95	2.12±1.91	3.15±2.66	<0.001	3>1,2
Provoked aggression	3.42±3.32	4.94±3.96	6.47±4.9	<0.001	3>1
Initiated aggression	1.91±3.04	2.53±3.35	3.92±3.99	0.002	3>1
Parent evaluation of total aggression	16.31±15.23	21.02±16.11	27.75±19.16	<0.001	3>1
School					
Verbal aggression	4.29±5.72	4.74±4.45	7.6±5.99	0.003	3>1,2
Aggression against objects	1.3±3.28	1.04±1.63	2.12±2.84	0.058	
Provoked aggression	2.41±3.21	2.72±2.93	3.98±3.41	0.010	3>1
Initiated aggression	1.51±2.47	1.77±2.12	3.16±3.01	<0.001	3>1,2
Teacher evaluation of total aggression	9.51±13.23	10.28±10.52	16.9±13.99	0.001	3>1,2

1: ADHD-Combined; 2:ADHD+ODD; 3: ADHD+CD

Children Aggression Scale Parent and Teacher Forms also evaluated aggressive behaviors of children. In all domains of both forms of this scale, statistically significant differences between groups were observed between diagnostic subgroups. The pairwise comparisons of the scales revealed that, ADHD+CD group had the highest scores in the analyses (Table 2).

	ADHD Mean±SD	ADHD+ODD Mean±SD	ADHD+CD Mean±SD	p	Pairwise Comparisons
Parent					
Provoked physical aggression	3.42±3.32	4.88±3.94	6.49±4.91	<0.001	3>1
Initiated physical aggression	1.91±3.04	2.52±3.32	3.94±3.99	0.002	3>1,2
Aggression against family members	9.05±8.34	10.92±8.99	13.32±9.73	0.006	3>1
Aggression against non family members	5.2±6.39	6.71±5.99	9.88±8.45	0.002	3>1,2
Aggression toward peers	7.8±7.76	10±8.85	12.48±9.27	0.013	3>1
Aggression toward adults	5.53±5.93	6.4±5.61	8.84±8.22	0.004	3>1
Teacher					
Provoked physical aggression	2.41±3.21	2.72±2.93	3.98±3.42	0.012	3>1
Initiated physical aggression	1.51±2.47	1.77±2.12	3.11±2.98	<0.001	3>1,2
Aggression toward peers	5.42±5.83	7.09±6.01	9.73±6.39	0.001	3>1,2
Aggression toward adults	1.65±3.84	0.98±2.47	2.68±4.44	0.021	3>1

1: ADHD-Combined; 2:ADHD+ODD; 3: ADHD+CD

Child Behavior Check-List assessments are summarized in Table 3. Similar to other scales, pairwise comparisons revealed that the highest scores in each domain were observed in ADHD+CD group. The only subdomain without statistical significance between groups was the thought problems in teacher form, and the remaining domains were all statistically significantly higher in ADHD with comorbid CD.

Table 3. Delinquent behavior, aggression and rule breaking behavior subscales of Child Behavior Check-List and Adaptive Functioning Scale of Teacher Report Form

	ADHD Mean±SD	ADHD+ODD Mean±SD	ADHD+CD Mean±SD	p	Pairwise Comparisons
Parent					
Social problem	60.16±9.33	58.96±8.33	63.58±10.36	0.003	3>1
Thought problems	60.87±7.64	59.27±7.44	63.8±9.58	0.002	3>1
Attention problems	63.64±9.46	64.35±6.93	69.13±9.63	<0.001	3>1,2
Rule-breaking behaviors	56.37±7.5	58.17±8.69	62.27±9.5	<0.001	3>1,2
Aggressive behaviors	58.57±9.5	60.12±9.13	64.64±11.17	<0.001	3>1,2
Total	60.55±10.17	61.71±8.42	65.98±9.84	<0.001	3>1,2
Externalizing	55.37±11.54	58.85±9.94	63.03±11.45	<0.001	3>1
Teacher					
Social problem	59.59±7.29	59.58±7.94	63.84±9.14	<0.001	3>1,2
Thought problems	58.56±7.97	57.89±7.79	60.41±9.01	0.099	
Attention problems	58.68±6.19	58.68±5.6	62.67±7.21	<0.001	3>1,2
Rule-breaking behaviors	55.15±5.85	56.26±7.2	60.57±8.45	<0.001	3>1,2
Aggressive behaviors	58.75±8.41	60.96±9.47	66.5±10.87	<0.001	3>1,2
Total	59.36±8.03	59.74±7.84	64.91±8.8	<0.001	3>1,2
Externalizing	57.34±8.52	59.47±8.94	64.9±9.68	<0.001	3>1,2
TRF					
Appropriate behaviors	46.95±7.07	46.58±6.61	43.62±6.32	<0.001	1>3
Happiness	47.90±6.90	45.72±5.30	44.99±5.83	0.003	1>2,3
Total adaptive functioning	46.47±6.77	45.68±5.85	43.42±5.73	0.001	1>3

4. Discussion

Aggression is an important behavioral pattern, which is a frequent component of ADHD, but this clinical condition has not been well defined in different comorbid conditions. Presence or absence of aggression is not a criterion for ADHD diagnosis, but its presence seriously impacts clinical presentation and natural course of ADHD (Broidy, Nagin et al. 2003). It is also one of the most important reasons for the treatment referral and an important variable in determining the treatment type of ADHD (Connor, Chartier et al. 2010). Overblown anger and hostile behavior in the face of easily triggered irritations are prominent symptoms of oppositional defiant disorder (ODD). They are also quite common among those with conduct disorder (CD) (Blader, 2018). It is very well known that ADHD is highly comorbid with ODD and CD, which are also the other most important disorders related to aggression in childhood. Despite this commonly known information, there is scarcity of data about the differences between pure ADHD, ADHD+ODD and ADHD+CD in terms of aggression type and severity. In this study, we investigated the type and severity of aggression in a relatively large and very well defined sample of ADHD, ADHD+ODD and ADHD+CD. For the best of our knowledge, this is the first study that evaluates the type and severity of the aggression in ADHD, ADHD+ODD and ADHD+CD obtaining data from both parents and teachers using three different instruments from each informant.

The results of this study suggest that ADHD+CD cases are more aggressive than pure ADHD group in all domains of aggression according to both teachers and parents that were assessed by the all 4 separate aggression instruments used in the study. ADHD+ODD group appeared in the same place with the pure ADHD group while classifying for severe forms of aggression like “initiating aggression” and “aggression to others” assessed by CAS parent and teacher scales, delinquent behavior, aggression and rule breaking behavior subscales of CBCL and TRF and CD subscale of T-DSM-IV-S parent and teacher forms. But they didn’t differ from ADHD and ADHD+CD groups and placed in the intermediate position in terms of verbal aggression, provoked aggression and aggression against objects and animals assessed by CAS parent and teacher, ODD subscale of T-DSM-IV-S parent and teacher forms. Total aggression scores, which were calculated by the sum of the all domains of CAS parent and teacher scales, were higher in ADHD+CD group than the other two groups. Reanalysis of the data controlling for differences in Verbal IQ and age did not affect findings on any dependent measures. These findings are in line with the previous studies suggested that ADHD+CD group more related with overt aggression than pure ADHD and ADHD+ODD groups (Harty, Miller et al. 2009). Also in line with the

literature, ADHD+ODD group express aggression verbally and in more reactive way that puts them in the mid position between ADHD and ADHD+CD groups (Harty, Miller et al. 2009).

General psychiatric problems as assessed by total problem subscale of CBCL and TRF are higher in ADHD+CD group than the other two groups both for parents and teachers. Additionally mania subscale of CBCL, which is calculated by the sum of anxiety-depression, attention deficit, and the aggressive behaviors, are also higher in ADHD+CD group than the other two groups. This also supports our suggestion of ADHD+CD is more severe disorder than the other groups, since the mania subscale of CBCL is proposed to be an indicator of intensity in childhood psychiatric disorders recently (Biederman, Petty et al. 2012). In terms of ADHD severity, ADHD+CD group exhibited more severe hyperactivity symptoms than ADHD group but not significantly higher than ADHD+ODD group. This finding also support our conclusion about the aggression type that reveals ADHD+ODD group acts like ADHD+CD group in terms of less severe aggression and psychopathology, but they acts like ADHD group and differ from the ADHD+CD group in terms of overt-proactive aggression and total psychiatric problems.

In line with the literature the head to head correlations of all subscales are relatively poor between the parent and teacher aggression ratings. But, fortunately they were almost similar in classifying diagnostic groups for the subscales of aggression. Although it has been hypothesized that teacher ratings of aggression are problematic in some ways (Halperin, McKay et al. 2003), obtaining data from different sources are important particularly in an area of aggression that may cause significant problems.

Limitations

The cross-sectional nature of the data is the most important limitation of this study. Longitudinal studies are needed to better assess aggression in cases of ADHD and comorbidities. In addition, this study was not able to evaluate whether aggression is relational or social. However the sample is an important one to study; non-clinical samples with different educational backgrounds should be studied in the future.

Implications

Aggression among children and adolescents is a great concern for both researchers and professionals who work with youth. Aggressive behavior is considered a problem both in homes and in schools, and numerous programs have been developed for both parents and educators in an effort to reduce and prevent aggression in children and adolescents (Boxer & Dubow, 2002; Eargle, Guerra, & Tolan, 1994; Murray, Kelder, Parcel, Frankowski, & Orpinas, 1999; Barnes, Leite & Smith, 2017). Moreover, effective preventive strategies against aggressiveness in schools can only be achieved by defining the groups most under risk, by the means of psychiatric disorders such as ADHD and comorbidities. Aggressive behavior appear to be different across ADHD, ADHD+ODD and ADHD+CD groups. Treatments and interventions need to be different across these groups as well.

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