

Clinical Correlates of Oppositional Defiant Disorder and Attention-Deficit/Hyperactivity Disorder in Adults

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Abstract

Objective: Oppositional defiant disorder (ODD) is a common comorbidity of attention-deficit/hyperactivity disorder (ADHD) in both children and adolescents. Although there is research demonstrating that ADHD persists into adulthood, less is known about the frequency of its persistence, clinical characteristics, and impairment when associated with comorbid ODD in adults with ADHD. **Method:** Data from a randomized clinical trial of adults with ADHD were analyzed to determine the prevalence and clinical correlates of comorbid ODD. As per the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria, patients who reported having ≥ 4 symptoms “often” or “very often” were classified as meeting the symptom criteria for the disorder. **Results:** Forty percent of this sample met symptom criteria for ODD. Subjects with ODD were more likely to have other comorbid disorders, lower investigator ratings of overall functioning, and lower patient life satisfaction ($P < 0.05$). A regression analysis using these variables predicted 40% of the variance of ODD as a comorbid condition in addition to ADHD. Although the presence or absence of ODD at baseline does not moderate response of ADHD symptoms with treatment, improvement in ODD symptoms was mediated by improvement in ADHD symptoms ($P < 0.0001$). Oppositional defiant disorder treatment was more responsive to dextroamphetamine than paroxetine, despite the contribution of irritability and reactive tantrums, as symptoms of the disorder. **Conclusion:** Oppositional defiant disorder is a valid and impairing disorder requiring evaluation and treatment in adults.

Keywords: oppositional defiant disorder; attention-deficit/hyperactivity disorder; adult; screening

Introduction

Clinicians should be alert to the possibility of oppositional defiant disorder (ODD) in adults with ADHD. When present, ODD contributes substantially to the impairment associated with ADHD. Oppositional defiant disorder does not moderate medication outcome, but features of ODD may or may not respond to medication treatment. It is well established that ADHD persists into adulthood in many patients, with a current prevalence of 4.4%,¹ and it also causes clinically significant functional impairment.^{2,3} It has also been established that ODD⁴ continues to be comorbid with ADHD in the adult population, much as it presents as a common comorbidity in the child population.⁵ More recently, it has become clear that ODD in adults is underrecognized, and rarely treated in its own right. The risk of further comorbidity in adults with ADHD and ODD is greater than in those with ADHD who do not have ODD.^{6,7}

The symptom criteria for ODD in the *Diagnostic and Statistical Manual of Mental Disorders, Forth Edition* (DSM-IV) requires 4 of 8 symptoms to be present. In

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addition, the disorder must be associated with functional impairment, cannot occur only in the context of another disorder that explains the symptoms, and the diagnosis is contingent on absence of another disorder that better explains the symptoms. The DSM-IV does not recognize the possible occurrence of ODD in patients aged > 18 years. The DSM-IV further stipulates that there is no conduct disorder (CD) and that the patient does not meet criteria for antisocial personality disorder. The possibility that ODD exists in adults as a syndrome of chronic, irritable, and negativistic behavior has been demonstrated in previous research,⁸ but there are few studies with a primary objective of investigating ODD in adults with ADHD. If one takes a conservative view that the prevalence of ODD in adults with ADHD is 25%, this still represents a serious, common, and treatable condition that needs to be investigated. One cannot assume that the treatments shown to be effective for ODD in children are going to be effective in adults.⁹

The 4.4% rate of ADHD in the adult population in the National Comorbidity Study Replication demonstrated that ADHD persists into adulthood, and raises questions as to whether the conditions comorbid with childhood ADHD might also persist into adulthood. Oppositional defiant disorder is present in approximately 40% of children with ADHD,⁵ and contributes significantly to morbidity.¹⁰ The hallmark of ODD is defiance, externalizing blame, anger, irritability, and tantrums. These symptoms may be interpreted as a personality disorder by adult psychiatrists, who may be unfamiliar with the presentation of ODD in children. Research on ODD in adults has been a neglected area of investigation, given its prevalence, impairment, and the opportunity for effective psychosocial interventions when properly diagnosed.¹¹

Forty percent of children with ADHD will also have ODD, making ODD the most common comorbid condition of childhood ADHD.¹² A recent study of impairment in adults with ADHD reported systematic assessment of ODD using the Kiddie-Schedule for Affective Disorder and Schizophrenia (K-SADS) modified for adult use, and found a current prevalence of 24% and a lifetime prevalence of 38%.^{13,14} Previous studies have also noted ODD as a common comorbidity contributing significantly to increased morbidity.¹⁵ The most systematic study of the prevalence of ODD in adults with ADHD has been done by Barkley, who found a highly significant association between the disorders in childhood and adulthood.⁶

Gadow et al¹⁶ conducted the first extensive, community-based study of ODD in adults. They reviewed 490 clinical subjects and 900 community controls and compared those

who had ODD only or ADHD only with those with ODD and ADHD, and those who had neither condition. Data were collected using both a self-report and a collateral report on a validated DSM-IV rating scale that looks at a wide variety of clinical conditions, as well as questionnaire looking at social, educational, occupational, and treatment variables. Findings showed that the 3 symptom groups exhibited more severe co-occurring symptoms of other psychiatric disorders than the group that had neither condition. Moreover, there were also clear differences in co-occurring psychiatric symptoms and demographic characteristics between the ODD-only and ADHD-only groups. For example, patients in the ODD-only symptom group reported more severe ratings of aggression and other antisocial behaviors, such as substance use, than the ADHD-only group. The overall pattern of group differences was generally similar in both community and clinic samples. Gadow et al¹⁷ also found ADHD with ODD in adults increases the risk of functional impairment and precedes and increases the risk for having other psychiatric diagnoses, such as CD and mood and anxiety disorders.

The objective of this article is to describe the association between ODD symptom severity and demographic, clinical characteristics, and functional impairment in a sample of patients with ADHD. The article also aims to identify predictors of ODD symptoms. In addition, this is the first study to report whether the presence of ODD at baseline moderates ADHD treatment response and whether improvement in ADHD is associated with improvement of ODD symptoms in adults, as well as the differential response of ODD to paroxetine versus dextroamphetamine.

Methods

Participants

Full details of the patient sample and methodology have been previously reported in detail elsewhere, but will be briefly summarized for the purpose of the analysis presented here.¹⁷ The study population consisted of 81 adults (18–66 years). The study excluded patients with significant psychiatric or neurological disorders that required treatment in their own right, or therefore represented an ethical contraindication to participation in the study. Patients had to have an overall intelligence quotient (IQ) of > 80 and be able to comply with the demands of the protocol.

Informed consent was provided by all participants prior to the initiation of procedures at the screening visit. The study protocol was approved by the ethics review committee/institutional review board at each of the 5 participating sites (University of British Columbia, Yale University, University

of Toronto, McGill University, and Duke University), and the study was carried out in accordance with the principles of the Declaration of Helsinki.

Measures

Adult Self-Report Inventory-4 and Adult Inventory

The Adult Self-Report Inventory-4 (ASRI-4) is a 136-item, DSM-IV–referenced rating scale.⁴ The Adult Inventory (AI) is a complementary scale completed by a collateral informant. Symptom categories (scales) include the major DSM-IV diagnoses as well as relevant developmental disorders in adulthood, such as ADHD, ODD, and CD. Both the ASRI and the AI can be scored either dimensionally (the sum of all items for each disorder) or categorically (whether the patient meets DSM-IV criteria defined as the threshold number of items checked as often or very often). The ASRI-4 documents behavioral symptoms of specific disorders but does not identify impairment or other DSM-IV exclusion criteria, so it cannot be considered diagnostic on its own in the absence of a full clinical evaluation. Diagnosis by symptom count that meets the DSM-IV criteria of 4 of 8 ODD symptoms rated in the clinical range (“often” or “very often”) can be considered as a proxy for clinical diagnosis in identifying oppositional symptomatology. Research shows that clinically diagnosed adults score in the moderate-to-high range for corresponding ASRI-4 symptom categories. The psychometric properties of the ASRI-4 ODD scale have been satisfactory in 6 independent studies of adults ($\alpha = 0.77\text{--}0.89$; $M = 0.84$). The psychometric properties of the AI and ASRI are similar. The adult symptom inventory items are taken directly from the DSM-IV, with slight changes in wording to make them appropriate for self-report or other report, and to simplify technical language. As a result, the number of items is always identical to that in the DSM-IV, with 9 items of inattention, 9 items of hyperactive/impulsive symptoms, 8 items of ODD, and 15 items of CD. The scoring algorithm rates an item as “positive” for items in CD, such as setting fires or physical aggression, where “sometimes” would be considered a highly salient event.

Measures of Functioning

Patients’ self-report of functioning was measured using the Sheehan Disability Scale (SDS), a simple analog scale that looks at social functional, home responsibility, and work.¹⁴ It has been widely used in a study of various conditions. The Longitudinal Interval Functional Evaluation (LIFE) is a structured clinician interview used to obtain information about work, school performance, relationships, family

relationships, leisure, and overall satisfaction, each of which is rated from 1 (very good) to 5 (severely impaired). The LIFE has good psychometric properties, high validity, and has been used in many disorders to obtain detailed information on objective level of functional impairment.¹⁸

Procedure

The data for this study were collected during the course of a randomized, double-blind, placebo-controlled, parallel-group study in outpatient adults with ADHD.¹⁷ All subjects enrolled in the trial were diagnosed with ADHD and received problem-focused therapy and either placebo, paroxetine, dextroamphetamine, or both medications combined. A comprehensive evaluation using all outcomes was performed at 10, 15, and 20 weeks, or at the last treatment visit. To account for missing endpoint data due to early termination or loss to follow-up over the course of the study, an intention-to-treat framework (ITT) was adopted, in which the last available data observation was carried forward to the study endpoint at 20 weeks.

Analyses

Descriptive statistics were used to describe the basic demographics of the sample. Pearson correlations were used to quantify the strength and direction of correlations, and *t*-tests were used to assess group differences on dimensional variables. In order to examine the demographic, clinical, and functional correlates that were predictive of ODD, those variables found to be significantly associated with ODD symptomatology on correlation analyses were entered into a multiple regression analysis. Moderator analysis of ODD diagnosis on change in ADHD was analyzed by assessing whether there was a statistically significant interaction between presence or absence of ODD symptoms and change in ADHD using repeated measures analysis of variance (ANOVA) with ODD as a between-subjects factor. Mediator analysis of impact of ADHD response on ODD symptoms was analyzed by splitting high versus low ADHD response based on the median (and mean) change score of 11, using a repeated measures ANOVA model, with ODD dimensional score as the repeated measure, and low versus high ADHD as a between-subjects factor. All data analyses were performed with SPSS version 13 software (SPSS, Inc., Chicago, IL).

Results

ODD and Demographics

The symptom criteria for ODD on the ASRI follows the DSM-IV convention of considering a patient as meeting symptom criteria for the disorder if 4 of 8 items are rated

“often” or “very often.” Alternatively, data can be analyzed dimensionally by the degree to which they are 1 to 2 SDs from the norm. In this sample, where 40% of ADHD patients met DSM-IV symptom criteria for ODD, only 22% met the much more rigorous criteria of being over the 95th percentile for the population.^{8,13} The DSM-IV criteria of 4 of 8 items rated as “often” or “very often” in this population captured adults who showed clinically significant impairment on other measures. There is no research to determine the relevance of the 4/8 symptom cut-off for adults, which has been adapted simply by convention from that used in children.

Patients with ODD were older ($M = 38.7$ years) than patients without ODD ($M = 33.4$ years; $t [72] = 2.25$; $P < 0.05$). There was a trend toward ODD being more common in males (48%) than females (27%) ($\chi^2 [1, N = 75] = 3.08$; $P = 0.08$). There was no difference in the likelihood that patients with ODD or without ODD would be married, in a relationship, be a particular ethnicity, or be employed.

Self-Report Versus Other Report of ODD

A total of 30 (40%) of 75 patients with completed scales met criteria for ODD by either self-report (15 patients), other report (24 patients), or both (9 patients). The self and collateral informant ODD ratings were significantly correlated ($R [73] = 0.29$; $P < 0.01$). Kappa for inter-rater reliability between informants was modest ($\kappa = 0.28$; $P < 0.01$). Thus, only one-third of patients were concordant by both informants.

ODD and Hyperactive/Impulsive Versus Inattentive Symptoms

Patients with ODD showed a statistically significant greater likelihood of having 6 of 9 symptoms of hyperactive/impulsive behavior ($\chi^2 [1, N = 75] = 7.17$; $P < 0.01$), but no statistically significant association with meeting the criteria of 6 of 9 items of inattention rated as “often” or “very often.”

ODD and Risk for Comorbid Conditions

Self-reported oppositional symptom severity was correlated with self-reported symptom severity of a variety of other conditions, including eating disorder symptoms ($R [77] = 0.38$; $P < 0.01$), bipolar symptoms ($R [78] = 0.36$; $P < 0.01$), anxiety symptoms ($R [78] = 0.44$; $P < 0.001$), and depressive symptoms ($R [77] = 0.34$; $P < 0.01$).

The proportion of patients with or without substance use or dependence (ie, alcohol abuse, marijuana use, or use of other illegal drugs) with or without ODD was almost identical ($\chi^2 [1, N = 75] = 0.001$; $P = 0.98$). There were no

differences between ADHD with and without ODD on severity of any substance use ($t [72] = 0.69$; $P = 0.49$), and when we looked at the sample as a whole, oppositional symptoms were not correlated with substance use ($R [78] = 0.07$; $P = 0.54$). To determine if the presence of substance abuse was better explained by CD than ODD, we tested whether patients with ADHD and > 1 SD for CD had increased risk for substance use symptoms. Elevated CD symptoms differentiated substance use severity ($t [78] = 2.14$; $P < 0.05$). Using a much tighter criteria for severity of CD (ie, defining those patients with ADHD who were > 2 SD outside the population norm for CD or greater than the 96th percentile) produced a similar result ($t [78] = 2.57$; $P < 0.05$). The correlation of substance use symptoms and ADHD symptoms for the sample as a whole was also significant ($R [78] = 0.27$; $P < 0.05$). A regression entering ADHD, CD, and ODD simultaneously ($R^2 = 0.34$; $P < 0.05$) found that only CD was a significant predictor of substance use severity ($P < 0.01$).

ODD and Risk for Functional Impairment

Patients with ADHD and ODD had significantly lower ratings on the Global Assessment of Functioning ($M = 51.0$) versus those without ODD ($M = 54.3$, $t [71] = 2.02$; $P < 0.05$). Patients’ self-report of ODD symptom severity measured dimensionally was significantly correlated with ratings of impairment in social life on the SDS ($R [77] = 0.41$; $P < 0.001$), but not with self-ratings of impairment in work or home. If the patient fully met the categorical symptom criteria defined as 4 of 8 symptoms rated as “often” or “very often,” then there was significantly greater impairment in both social ($t [70] = 2.69$; $P < 0.01$) and family life/home responsibilities ($t [70] = 3.21$; $P < 0.01$). Improvement in ODD was also correlated with improvement in the patient’s rating of their social life, using last observation carried forward (LOCF) up to 20 weeks ($R [65] = 0.34$; $P < 0.01$).

Patients who met full symptom criteria for ODD were seen by clinicians as having significantly greater impairment on the LIFE. They had lower scores on overall global social adjustment scores ($t [70] = 2.43$; $P < 0.05$) and more difficulty with friendships ($t [70] = 2.73$; $P < 0.01$). Oppositional defiant disorder symptom severity was also found to be significantly correlated with clinician ratings of severity of impairment in friendships ($R [77] = 0.38$; $P < 0.01$). Patients who reported greater difficulty with ODD symptoms were rated by the clinician as having a lower level of satisfaction with their lives ($R [77] = 0.35$; $P < 0.01$) and poor global adjustment ($R [77] = 0.22$; $P = 0.05$).

ODD and ADHD Moderator/ Mediator Effects

Change in ODD and ADHD symptoms by self-report for the population taken as a whole using an ITT model were correlated with each other ($r [68] = 0.64; P < 0.01$). Presence or absence of ODD symptoms at baseline did not interact with change in ADHD symptoms over time ($F [1, 63] = 0.02; P = 0.90$). When the sample as a whole was split by the median change in ADHD (11, using the 18 items on a 3-point Likert scale), change in ODD symptoms was mediated by high versus low ADHD response ($F [1, 66] = 24.29; P < 0.0001$). Patients who showed a robust response in ADHD symptoms thus also showed greater improvement in ODD symptoms. The methods and concept of moderator/mediator analyses were taken from Kraemer.¹⁹

The symptom criteria for ODD on the ASRI follows the DSM-IV convention of considering a patient as meeting symptom criteria for the disorder if 4 of 8 items are rated “often” or “very often.” Alternatively, data can be analyzed by dimensional criteria according to whether the patient’s symptom severity was 1.5 SDs above the normative mean at the 95th percentile. In this sample, 40% of ADHD patients met the DSM-IV symptom criteria for ODD by symptom count, and 22% met the more rigorous criteria of being over the 95th percentile. Thirty (40%) of 75 patients with completed ASRI-4 and AI-4 scales met criteria for ODD by either self-report (15 patients), other report (24 patients), or both (9 patients). The self and collateral informant ODD ratings were significantly correlated ($R [73] = 0.29; P < 0.01$). Mean ASRI-4 ODD symptom severity did not differ between males ($M = 8.58; SD = 4.19$) and females ($M = 7.68; SD = 5.26; t [78] = 0.83; P = 0.41$). There was no difference in ODD symptoms between single patients ($M = 7.80; SD = 3.56$) and patients living with a partner ($M = 8.81; SD = 5.32; t [72] = 0.92; P = 0.36$). Increasing patient age was found to be significantly correlated with ODD symptom severity in this group of adult patients ($R [78] = 0.26; P < 0.05$).

A measure of the extent of comorbidity in this sample was given by the total number ASRI-4 DSM-IV diagnostic cutoff values met by each subject. The mean number of comorbid conditions in this sample was 9.99 ($SD = 6.37$). Greater ODD symptom severity was moderately correlated with an increased number of comorbid conditions ($R [76] = 0.48; P < 0.001$).

Functional impairment in this study was measured by both patient self-report (SDS) and a detailed clinician interview (Global Social Adjustment scale of the LIFE). On both

measures, there was clinically significant functional impairment that was positively correlated with ODD symptoms (SDS: $M = 19.64; SD = 6.33; R [73] = 0.31; P < 0.01$); LIFE Global Social Adjustment ($M = 3.17; SD = 1.02; R [75] = 0.22; P = 0.05$).

A multiple regression analysis was conducted with ODD symptom severity as the dependent variable and demographic (age), clinical (number of comorbid conditions), and functioning (LIFE: Global Social Adjustment and SDS) variables, which were shown to have an association with ODD symptom severity in the above bivariate analyses. The model was significant ($F [4, 75] = 7.11; P < 0.001$), with an adjusted R^2 of 0.26. Number of comorbid conditions was the only significant predictor in the model (Table 1).

Changes in ODD and ADHD symptoms by self-report were significantly correlated with each other ($r [68] = 0.64; P < 0.01$). Patients who showed a robust response in ADHD symptoms also showed greater improvement in ODD symptoms. However, there was no significant difference in change in ADHD symptoms between patients meeting ASRI-4 ODD cutoff criteria at baseline ($N = 15; M = 13.26; SD = 8.76$) and those patients with subclinical ODD at baseline ($N = 53; M = 9.18; SD = 11.07; t (66) = 1.50; P = 0.14$).

Given that ODD includes both mood-related symptoms (irritability, easily annoyed, angry) as well as symptoms of defiance, we examined whether ODD would show any differential response to dextroamphetamine versus paroxetine. There was greater overall change in ODD with dextroamphetamine ($M = 4.18$) than paroxetine ($M = 1.92$). When this was analyzed using the factorial design (dextroamphetamine alone, dextroamphetamine and paroxetine, paroxetine alone, or placebo), there was a significant main effect of dextroamphetamine, but not paroxetine.

Discussion

This study confirmed earlier preliminary research demonstrating that the prevalence of ADHD in adult samples with ADHD is comparable with that found in child samples. Some of the longitudinal studies of ADHD have specifically examined the persistence of not only ADHD from childhood to adulthood, but also the persistence of ODD, which has previously been defined as a disorder present in childhood. The long-term follow-up studies demonstrate that a small minority of patients with ADHD and ODD go on to CD, but more commonly ODD persists into adolescence as a disorder in its own right.²⁰ In the Milwaukee long-term follow-up, Barkley and Murphy⁶ were able to show clear persistence of ODD from childhood into adulthood, with a 50% rate of remission, and a strong

Table 1. Unstandardized and Standardized Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	P Value
	Beta	Standard Error	Beta		
Constant	1.886	2.072		0.910	0.366
Age	0.064	0.044	0.157	1.439	0.155
LIFE: Global Social Adjustment	0.104	0.501	0.024	0.207	0.837
Number comorbid conditions	0.322	0.079	0.483	4.093	0.000
SDS	0.020	0.083	0.029	0.236	0.814

Abbreviations: LIFE, Longitudinal Interval Functional Evaluation; SDS, Sheehan Disability Scale.

statistical risk for ODD when compared with clinical⁸ or community samples, indicating a specific association between the 2 disorders.^{8,15} Barkley⁸ found that in the sample with persistent ADHD into adulthood, 47.3% also had persistent ODD. More recently, Garcia et al¹³ performed a cross-sectional evaluation of ODD in adults using an adaptation of the K-SADS (a semi-structured diagnostic interview) for adults, finding a prevalence of 27%. The range from approximately one-fourth of adults with ADHD to half of adults with ADHD demonstrating continued persistence of ODD is consistent with what we found using categorical versus dimensional scoring procedures for the ASRI-4.

Clinical correlates of comorbid ODD and ADHD are similar in adult and child samples, with greater risk for males, higher levels of hyperactive versus inattentive symptoms, and greater risk for eating and externalizing disorders. Our analyses of substance abuse is also consistent with the previous literature in that after controlling for CD, ADHD was no longer a predictor of substance abuse in this older age group. In all of the studies that have looked at the relationship between symptom dimensions and comorbid presentations, it has been well demonstrated that symptoms of ODD are more highly correlated with hyperactive impulsive symptoms and the combined versus the inattentive type.²¹

Our findings are also very similar to the literature on ADHD in adults in that the high male/female ratio seen in childhood abates with age, so that the ratio of men to women becomes approximately equal. This study was able to demonstrate that when ADHD patients with ODD are compared with those without ODD, they are more likely to have other comorbid disorders, and to be more functionally impaired. An unexpected finding was the observation that ODD was correlated with patients being older, rather than younger. Our assumption was that because this was part of a childhood condition, it would be more prevalent in younger age groups. A possible explanation of this finding is that the mean age of this sample population was well into their thirties. It may be that those patients who were able to gain insight

and develop the skills to manage their irritability or defiance had done so by this point, and it was only the patients with more severe symptoms who demonstrated continuity of the full syndrome. One of the 8 symptoms of ODD is “blaming others for one’s own mistakes.” Therefore, lack of insight into one’s own contribution to problems is itself a defining attribute of the disorder, which may abate with age.

Medication treatment seems to benefit both ODD and ADHD symptoms in comorbid patients. There is research on the relationship between outcome of ADHD and ODD in children. A moderator is a variable that is present prior to treatment that affects patient outcome, while a mediator is a variable that occurs during treatment and impacts patient outcome.^{12,13} When looking at the relationship between ODD and ADHD in children, the presence or absence of ODD at baseline does not preclude positive outcomes of ADHD symptoms (ie, ODD is not a moderator of ADHD symptom response). However, when ADHD symptoms improve during treatment, ODD also often improves.²⁰ Improvement in ADHD is thus a mediator of ODD outcome. This study is the first to therefore replicate the child literature in demonstrating that ODD is not a moderator of ADHD outcome, but when ADHD improves, it is correlated with improvement in ODD at outcome. This is also the first study to demonstrate that despite the mood dimension of ODD, it is more responsive to stimulant than antidepressant treatment. Persistent ODD symptoms in adults with ADHD contributes to higher morbidity when compared with ADHD alone. Patients with ODD symptoms and ADHD had significantly greater impairment in functioning as measured both by self-report and clinician assessment. Our findings are consistent with previous studies of the clinical correlates of ODD symptoms in adults, and with the literature on children. This study suggests that in patients in whom ADHD persists into adulthood, ODD symptoms may also be persistent, and that ODD carries many of the same risk factors for the adult patient as it does for children. This raises the question as to whether ODD in adults may also

be treatable, much as it is amenable to behavioral and other interventions in children.

As demonstrated in the literature on children, improvement in ADHD symptoms has an impact in mitigating ODD.²² This further implies that treatment of ADHD in adults may assist in mitigating some of the impact of ODD symptoms on friendships and life satisfaction, and opens the door to further research on treatments that specifically target the comorbid presentation.

Limitations

There is a sample bias because the subjects were self-referred. Patients with severe ODD may be expected to externalize their problems, and thus avoid seeking help for themselves. It is unknown whether adults with ODD can reliably self-report their own symptoms. Adults with ODD may under-report difficulty with work or responsibility at home, but reliably report social difficulties because this may be more easily conceptualized as someone else's problem. The study may therefore underestimate both the prevalence of ODD and its impact on functional impairment as compared with an unselected community sample or a clinic sample with full clinical assessment.

There is no research to date to determine the relevance of the 4 of 8 symptoms cut-off for adults, which has been adapted simply by convention from that used in children. The same is true for the use of pediatric criteria for the DSM-IV definition of ADHD in adults. This is an issue that will hopefully be addressed by the DSM-V committee, given that they are looking at ensuring that the diagnostic criteria for childhood-onset developmental disorders, such as ADHD, are phrased in a way appropriate to those who continue to carry symptoms or impairment into adulthood. One of the limitations of the study is that the data were derived from self-report and other report of symptoms, without the benefit of clinician diagnoses. Therefore, the high rate of comorbidity needs to be understood as indicating that these patients also rated themselves as having a wide range of other symptoms, which would not likely meet diagnostic criteria for the disorder in a systematic evaluation. Nonetheless, it should be noted that recent studies of ADHD have demonstrated that 9 of 10 patients have comorbidities,¹ with almost half of adults with ADHD having a mood or anxiety disorder. The data are therefore consistent with our understanding of ADHD in adults as a highly comorbid condition, and a condition in which patients may be comorbid with a large number of other disorders, although this has not been studied.

The study is limited by any analyses that look at individual treatment groups in which the group sizes are small, which limits power. The data to date are sufficient to indicate that a study of ODD in adults that is adequately powered would reveal meaningful information about the presentations and persistence of ODD in adults, and its response to treatment.

Conclusion

Oppositional defiant disorder may be a common comorbid condition in adults with ADHD that negatively impacts social and family relations, social adjustment, and life satisfaction. Individuals with ODD symptoms may respond to treatment for ADHD, but the presence of ODD does not predict response to ADHD treatment. Clinicians treating adults with ADHD need to be aware of ODD, and consider providing adult patients with ODD and ADHD with the same kind of psychoeducation and psychological interventions that are effective in younger age groups.^{9,11} The clinical implication of this study is that screening and diagnosis of ODD in adults with ADHD may facilitate its treatment and prevent misdiagnosis as a personality disorder.

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Conflict of Interest Statment

Margaret D. Weiss, MD, PhD discloses conflicts of interest with Abbott, Eli Lilly, Janssen, Novartis, Perdue, and Shire. Lily Hechtman, MD discloses conflicts of interest with Eli Lilly, Perdue, Janssen, and Shire. Michael Wasdell, MA, Kenneth D. Gadow, PhD, Brian Greenfield, MD, and Chris Gibbins, PhD disclose no conflicts of interest.

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