

Adult ADHD: Issues and Answers

CME Newsletter of the Adult ADHD Program,
Department of Psychiatry, NYU School of Medicine

Adults with ADHD Who Drive – Danger on the Highways

In a recent study, participants with attention deficit hyperactivity disorder (ADHD) reported more anger while driving and more aggression while using their vehicle than their non-ADHD peers.¹ Drivers with adult ADHD rate themselves as angrier, riskier, and unsafe and report experiencing more losses of concentration and vehicular control than did the college students with which they were compared, according to the results of the study supported in part by the Centers for Disease Control and Prevention (CDC) and the National Institute on Drug Abuse (NIDA). Participants in the ADHD group included 56 adults (41 males, 15 females) diagnosed with ADHD (median age, 32 years); participants in the non-ADHD community sample included 106 adults (59 males, 47 females; median age, 37 years), while participants in the college student normative group included 432 (217 males, 215 females) introductory psychology students (median age, 19 years).

The instruments used included:

- The Driving Anger Scale (DAS), which measures the tendency to become angry while driving
- The Driving Anger Expression Inventory (DAX), which evaluates how the person expresses anger when driving by asking questions that range from “I try to cut in front of the other driver” to “I tell myself it’s not worth getting all mad about”
- The Driver’s Angry Thoughts Questionnaire (DATQ), which assesses angry thoughts people may have while driving (eg, “I would like to beat the hell out of them”)

While the results of the DAS did not differ significantly between the ADHD and non-ADHD groups ($P=.16$), on the DAX scales the ADHD group was more verbally and physically aggressive ($P=.03$ for both). The DATQ demonstrated more revenge/retaliatory thinking and physically aggressive thinking ($P=.01$ for both). Compared with the psychology student cohort, the ADHD group rated themselves as angry, aggressive ($P=.01$ for both), risky ($P=.02$), and unsafe ($P=.04$) drivers. The ADHD group also lost significantly more concentration and, in

the previous 3 months, had more moving violations and major accidents than the college group ($P=.01$ for all). However, the college students received slightly more tickets and experienced more minor accidents than the ADHD group.

In 1993, Barkley and cohorts proposed that the primary deficit in ADHD involves response inhibition, which consequently results in observable symptoms, including poor emotional self-regulation.² In the present study, ADHD drivers reported experiencing more driving anger than did non-ADHD drivers. They also testified using the vehicle more often to express their anger, with reports of significantly less adaptive and constructive driving anger expression. Hence, these results offer additional support for Barkley’s theory regarding emotional self-regulation and ADHD.

Another study focused systematically on the driver habits of children with ADHD followed into adulthood.³ A battery of driving measures was collected on hyperactive (H; $n=147$; mean age, 21 years) and community control children (CC; $n=71$; mean age, 20 years) followed for more than 13 years. More of the H than CC groups had been ticketed for reckless driving, driving without a license, and hit-and-run crashes, and had their licenses suspended or revoked. Official driving records found that more of the H group had received traffic citations and had a greater frequency of license suspensions. Further, the cost of damage in a first motor vehicle crash was also significantly greater in the H than CC group. Performance on a simulator also revealed slower and more variable reaction times, greater errors of impulsivity (false alarms, poor rule following), more steering variability, and more scrapes and crashes of the simulated vehicle against road boundaries in the H than in the CC group. Such deficits in simulator performance and unsafe driving behavior are consistent with clinic-referred adults with ADHD suggesting ongoing risks for such adverse driving outcomes in children growing up with ADHD.

According to the National Highway Traffic Safety Administration, car accidents are the leading cause of death in teenagers and adults, with motor vehicle crashes accounting for approximately 36% of all deaths for people aged 15 to 20. Additionally 45% of these fatalities occurred in speed-related crashes.

Statement of Need

Attention-deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral disorder of childhood; incidence ranges from 5% to 10% among school-age children. Up to 50% of children with ADHD continue to have ADHD-related problems during their adult years. In addition, many ADHD cases are first diagnosed only after patients have reached adulthood. Adults with ADHD may experience significant functional problems, such as job difficulties, academic underachievement, troublesome relationships with family and peers, and low self-esteem. Diagnosing ADHD in adults can be difficult, and—even when the diagnosis is made—available medications are often not used to treat the disorder, or medication management varies widely across communities and among physicians. Recent findings continue to expand the understanding of ADHD in these patients and the associated comorbidities. Brain research into binding sites and transporters also is enhancing the clinicians' understanding of how medications work to effect change in patients with ADHD.

As subjects with ADHD age and more adults are newly diagnosed, careful consideration should be paid to those activities which can not only endanger the patient their self, but also others around them such as driving an automobile. In addition to the above, it is important to understand recent research advances which seek to answer the question about the most appropriate drug treatment for adults with ADHD. Research has demonstrated that adults with ADHD have a greater likelihood of suffering from impaired concentration, anger, and aggression, as well as, be subject to more moving violations. Treatment of adult ADHD is not just limited to drug therapy, but also may involve non-pharmacologic methods such as psychoeducation, psychotherapy, and self-management skills training. In addition, techniques such as marital or family counseling, career counseling, and coaching may be beneficial for some individuals. Advances in the understanding of how the brain processes information is also of interest to many providers as they attempt to provide the highest quality of care.

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Learning Objectives

After completing this activity, you should be better able to:

1. Identify common associated driving impairments consistent with the adult with ADHD.
2. Summarize several non-drug therapies which may assist in the treatment and management of adult ADHD.
3. Evaluate recent research publications on the treatment of adult ADHD to advance the treatment and management strategies for adult ADHD.

Method of Participation

Read this newsletter, complete the CME Posttest Answer Form and Activity Evaluation Form, and fax or mail the forms to Medical Education Resources, Inc. at the address listed. You will receive a certificate by fax or mail. There is no certificate processing fee.

Intended Audience

This activity was developed for psychiatrists, primary care physicians/internists, neurologists, and psychologists.

Effective Dates

Released: October 2006

Expires: September 30, 2007

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This activity is jointly sponsored by Medical Education Resources, Inc. and MedLearning Inc. The activity is supported by an unrestricted educational grant from Shire.

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Dr Adler receives grant/research support from Abbott Laboratories, Bristol-Myers Squibb Company, Cortex Pharmaceuticals, Inc., Eli Lilly and Company, Johnson & Johnson, McNeil Consumer and Specialty Pharmaceuticals, Merck & Co., Inc., Novartis Pharmaceuticals, Pfizer Inc, and Shire US Inc. He is a consultant for Abbott Laboratories, Bristol-Myers Squibb Company, Cephalon Inc., Cortex Pharmaceuticals, Inc., Eli Lilly and Company, Johnson & Johnson, McNeil Consumer and Specialty Pharmaceuticals, Merck & Co., Inc., Novartis Pharmaceuticals, Pfizer Inc, and Shire US Inc. Dr Adler has participated in speakers' bureaus for Eli Lilly and Company, Johnson & Johnson, McNeil Consumer and Specialty Pharmaceuticals, Novartis Pharmaceuticals, Pfizer Inc, and Shire US Inc.

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Citations

1. Richards TL, Deffenbacher JL, Rosen LA, Barkley RA, Rodricks T. Driving anger and driving behavior in adults with ADHD. *J Atten Disord*. 2006;10:54-64.
2. Barkley RA, Guevremont DC, Anastopoulos AD, DuPaul T, Shelton TL. Driving-related risks and outcomes of attention deficit hyperactivity disorder in adolescents and young adults: a 3- to 5-year follow-up survey. *Pediatrics*. 1993;92:212-218.
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Combining non-drug therapy with medications in adult ADHD

Using medication to treat the symptoms of adult attention deficit hyperactivity disorder (ADHD) can be beneficial in controlling some of the detrimental effects of the condition. However, as with smoking and drinking cessation, nonpharmacological therapy may advance the patient into a higher level of treatment success. A study by Safren et al examined the efficacy, patient acceptability, and feasibility of a novel, cognitive-behavioral therapy (CBT) for adults with ADHD who are stable on medications but still show clinically significant symptoms.¹ In this study, 31 adults with ADHD were randomized to CBT plus continued psychopharmacology or continued psychopharmacology alone. Assessments included ADHD severity and associated anxiety and depression rated by an independent evaluator (IE) and by self-report. At the outcome assessment, those who were randomized to CBT had lower IE-rated ADHD symptoms ($P < .01$) and global severity ($P < .002$), as well as self-reported ADHD symptoms ($P < .0001$) than those randomized to continued psychopharmacology alone. Those in the CBT group also had lower IE-rated and self-reported anxiety ($P < .04$), lower IE-rated depression ($P < .01$), and a trend toward lower self-reported depression ($P = .06$). Cognitive-behavioral therapy continued to show superiority over continued psychopharmacology alone when statistically controlling levels of depression in analyses of core ADHD symptoms. Significantly more treatment responders among patients who received CBT (56%) were observed compared with those who did not (13%; $P < .02$).

Neurofeedback (NFB), which is based on theories that recognize the organic basis of ADHD, utilizes biofeedback to guide individuals to regulate their brain activity.² Neurofeedback provides immediate feedback to the individual about his or her brain wave activity in the form of a video game, whose action is influenced by the individual's meeting of predetermined thresholds of brain activity. Electrodes are attached to the scalp. Then, an electroencephalograph and computer receive and process electrical activity of the brain. Data are displayed to the client in a format resembling that of a video game. Clients who meet preset training parameters control the game action. Each time the brain waves find their way to the preset state, the client is quickly rewarded with positive feedback. Most often, clients are trained to reduce slow wave activity and increase fast wave activity. As clients learn to regulate their mental activity in this manner, symptoms of ADHD diminish.

A study by Rossiter involved 31 patients with ADHD who chose stimulant drug treatment (MED) and 31 patients who chose an NFB treatment program (EEG).³ Stimulants for MED patients were

titrated using the Test of Variables of Attention (TOVA). Electroencephalograph (EEG, effect size [ES] = 1.01-1.71) and MED (ES = 0.80-1.80) groups showed statistically and clinically significant improvement on TOVA measures of attention, impulse control, processing speed, and variability in attention. The EEG group demonstrated statistically and clinically significant improvement on behavioral measures (Brown Attention Deficit Disorder Scales, ES = 1.59). TOVA gain scores for the EEG and MED groups were not significantly different, ultimately demonstrating that the NFB program produced patient outcomes equivalent to those obtained with stimulant drugs. Other types of nonpharmacological therapies are presented in **Table 1**. More research is needed to prove that medications and non-drug therapies can work better than either modality alone.

Citations

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³Rossiter T. The effectiveness of neurofeedback and stimulant drugs in treating AD/HD: part II. Replication. *Appl Psychophysiol Biofeedback.* 2004;29:233-243.

⁴Murphy K. Psychosocial treatments for ADHD in teens and adults: a practice-friendly review. *J Clin Psychol.* 2005;61:607-619.

Natalie, age 39, is an advertising consultant. Her key problems suggest adult ADHD and conclude:

- Chronic tardiness – persistently late for appointments and in paying household bills
- Work difficulties – project procrastination, underperformance, disorganization, unnecessary crises, multiple job changes
- Losing/misplacing/forgetting items – had to return home from airport after realizing she forgot her passport; lost her wallet 3 times this year
- Socially isolated – difficulty in making plans to see friends
- Restlessness – difficulty remaining seated for more than 30 minutes at work, trouble waiting and becoming irritated, interrupting others when they are busy, talking out of turn, and inability to relax in the evening

Adult ADHD Self Report Symptom (ASRS) v1.1 Checklist was positive for significant symptoms in 8 of 9 inattentive and 6 of 9 hyperactive-impulsive symptoms. Natalie's mother reports teachers as far back as kindergarten observed easy distraction, fidgetiness, trouble completing tasks, and some academic deficit. Patient had been treated for symptoms of depression and generalized anxiety disorder (GAD). However, ADHD had not been diagnosed and signature symptoms continued.

Mental status examination was notable for full range of affect, with preponderance of depressed and anxious mood. Chronic early insomnia was present, but without other vegetative symptoms of depression. Psychotic symptoms and thought disorder were not present. No suicidal or homicidal ideation was noted and she appeared alert and fully oriented.

Table 1. Psychosocial Treatments for Adult and Adolescent ADHD⁴

Psychoeducation

- To convey information about ADHD and how it specifically affects patients
- To help the patient devise individualized treatments targeting their highest-priority goals

Individual psychotherapy

- To set treatment goals, and deal with immediate conflicts or crises
- To assist with problem solving around school, work, or family situations
- To help with life transitions such as a job or career change
- To deal with the coexisting problems that often accompany ADHD, such as anxiety, depression, substance abuse, low self-esteem, disorganization, or relationship difficulties

Compensatory behavioral/self-management skills training

- To provide skills to reverse disorganization, forgetfulness, tardiness, losing things, and difficulty in planning
- To teach skills to the patient so that daily living is more structured

Marital/family counseling

- To educate spouses and family members about ADHD
- To lessen the burden of those closest to the patient as s/he controls ADHD

Career counseling

- To ensure that the patient is correctly matched to his or her job/career

Group counseling

- To provide support from others with ADHD
- To relate to others in terms of symptoms, medication issues, anger control, decision making, stress reduction, etc.

Coaching

- As therapy is about insight; coaching is about action and getting things done
- To help clients identify goals, devise strategies to meet their goals, evaluate the effectiveness of the strategies, and make adjustments as necessary
- To provide honest feedback, reminders, time management and organizational strategies, and a friendly "kick in the pants" when necessary

Based on the number of presenting and historic inattentive and hyperactive-impulsive symptoms, initial assessment was positive for ADHD combined. Although dysthymia and GAD were comorbid, the ADHD symptoms antedated onset of mood disorder symptoms and, thus, did not seem to be the root cause of ADHD symptomatology.

As Natalie was hesitant to take a psychostimulant and wished to focus on her dysthymic as well as her ADHD symptoms, initial treatment was with bupropion XL 300 mg/day. On medication, her dysthymia significantly improved, whereas ADHD symptoms abated to only a lesser degree. As a result, treatment was initiated using mixed amphetamine salts (MAS) XR 20 mg/day – along with MAS immediate-release 5 mg to treat early evening ADHD symptoms – and buspirone 60 mg/day for GAD. Her morning dose of MAS XR was increased to 30 mg after one week, while maintaining the doses of both the immediate-release MAS and buspirone. On this regimen, substantial improvement was noted in both ADHD and

dysthymic symptoms. Significant symptomatic improvement continued for a period of 6 months. At this point, Natalie took a job with increased managerial responsibilities, yet her supervisor lacked the structure needed for Natalie to do well at this new job. Initiation of cognitive behavioral therapy (CBT) was quite helpful in managing residual dysphoria and attentional symptoms. However, full resolution of symptoms did not occur until there was a shift in her supervisor, who provided a clearer vision of the patient's responsibilities.

Take home points:

- Comorbid dysthymia and GAD were identified previously, but ADHD was overlooked
- Need exists for combination therapy when ADHD and comorbid conditions present
- Cognitive behavior therapy helped the patient cope during pharmacotherapy
- Recognize that symptoms are partially context-based. Further improvement with change in supervisors allowed the patient to more rationally plan and have a defined role

New studies expand drug options in adult ADHD

The results of 2 new studies expand the treatment options for adult ADHD patients.

Atomoxetine – QD or BID?

Atomoxetine hydrochloride is a Food and Drug Administration (FDA)-approved treatment for adult ADHD but, until now, no study clarified whether dosing once (QD) or twice daily (BID) was more advantageous. A randomized, double-blind, multicenter study by Adler and colleagues compared safety and tolerability of atomoxetine 80 mg QD versus atomoxetine 40 mg BID in 218 adults with ADHD.¹ Assessments included treatment-emergent adverse events (TEAEs), and scores on the Arizona Sexual Experiences Scale. The primary efficacy measure for this study was the mean change from baseline to endpoint using the Conners' ADHD Rating Scale-Investigator Rated: Screening Version (CAARS-Inv ADHD).

The overall incidence for any single TEAE was low, with no significant treatment group differences in patients experiencing more than 1 commonly observed TEAEs (dry mouth, insomnia, nausea, and erectile dysfunction). Frequency of nausea was significantly lower in the 40 mg BID group (16.4%) than in the 80 mg QD group (32.4%; $P = .007$). Categorical analyses showed that 14% of females and 28% of males experienced emergence of clinical sexual dysfunction during the course of the study, with no differences by treatment group for either males or females. Similarly, when analyzed within each gender, no differences were observed based on treatment group. Results are consistent with previous studies.

Although both QD and BID treatments were efficacious, the reduction in scores was greater for BID treatment. CAARS-Inv

ADHD scores were significantly reduced in both the atomoxetine 40-mg BID group (mean baseline and endpoint values of 37.2 and 20.2; $P < .001$) and 80-mg QD group (mean baseline and endpoint values of 38.4 and 25.1; $P < .001$; **Figure 1**). However, the reduction was significantly greater in the atomoxetine 40-mg BID treatment group than in the 80-mg QD treatment group (mean reduction of 17 vs 13 points; $P < .001$). Ultimately, the data indicate both dosing strategies are safe and efficacious in the treatment of adult ADHD.

MAS XR – How high is safe?

Stimulants have been studied extensively in children with ADHD and have a well-established safety and efficacy profile. A prospective, multicenter, randomized, double-blind, placebo-controlled, parallel-group, dose-escalation study was conducted by Weisler and associates in 255 adults with ADHD to assess the efficacy, safety, and duration of action of mixed amphetamine salts extended-release (MAS XR 20 mg, 40 mg, or 60 mg/day for 4 weeks).² The main outcome measures were the ADHD Rating Scale and Conners' Adult ADHD Rating Scale Short Version Self-Report (CAARS-S-S).

Mixed amphetamine salts XR treatment resulted in statistically and clinically significant ADHD symptom reductions at endpoint: mean ADHD Rating Scale scores were 18.5 for the 20-mg group ($P = .001$), 18.4 for the 40-mg group ($P < .001$), and 18.5 for the 60-mg group ($P < .001$). Adults with severe symptoms (ADHD Rating Scale score >32 at baseline) had significantly greater symptom reduction with the highest MAS XR dose (60 mg/day). Statistically significant ($P < .05$) improvements in CAARS-S-S ADHD index scores occurred at 4- and 12-hours postdose for all MAS XR groups, indicating a 12-hour duration of effect. Symptoms improved within the first treatment week. Most adverse events reported were mild or moderate in intensity and usually resolved after the first week of therapy. The most commonly reported adverse events were dry mouth (27% of all subjects enrolled), anorexia/decreased appetite (26%), insomnia (24%), and headache (24%).

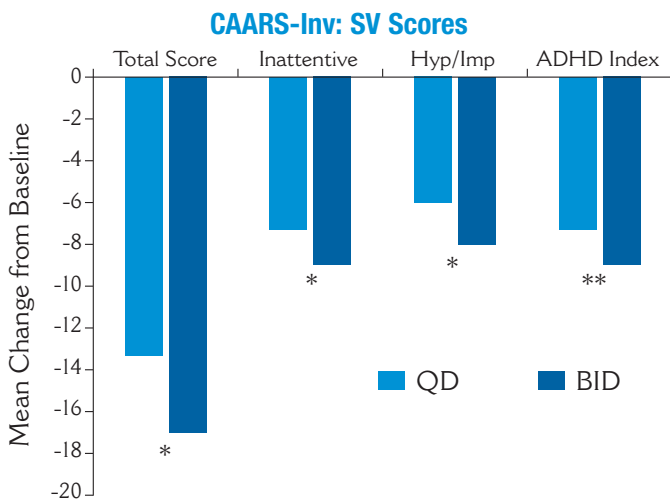
All doses of MAS XR adequately controlled ADHD symptoms for up to 12 hours and were well tolerated and there was no evidence of a dose-response relationship for safety assessments. Because treatment response appears to depend on baseline symptom severity, MAS XR should be dosed to optimal efficacy based on an objective symptom rating scale. Additional research is needed to document whether these short-term benefits are sustained during long-term treatment.

Citations

¹Adler L, Dietrich A, Reimherr FW, et al. Safety and tolerability of once versus twice daily atomoxetine in adults with ADHD. *Ann Clin Psychiatry*. 2006;18:107-113.

²Weisler RH, Biederman J, Spencer TJ, et al. Mixed amphetamine salts extended-release in the treatment of adult ADHD: a randomized, controlled trial. *CNS Spectr*. 2006;11:625-639.

Figure 1. Comparison of the efficacy of QD and BID atomoxetine for treating ADHD in adults.¹



Measured by the CAARS-Inv:SV Total score and the Inattentive, Hyperactive/Impulsive, and ADHD Index subscales. Mean change from baseline data are shown. * = $P < .001$; ** = $P < .01$ for QD versus BID comparisons.

Adapted with permission from Adler L, et al. Safety and Tolerability of Once Versus Twice Daily Atomoxetine in Adults with ADHD. *Ann Clin Psych* 2006;18(2):107-13.

Journal reviews

Right brain trumps left brain in adult ADHD

A new study shows that the left hemisphere of the brain takes a back seat to the more controlling right hemisphere when processing words and emotions.¹ Non-ADHD individuals are left-brain thinkers, that is, logical and systematic, while many ADHD people tend to be right-brain dominant. That is, they see the whole picture and often think in terms of combinations outside left-brain parameters. For left-brain people, "2 plus 2" is 4; for right-brain people it might just as easily be 22. The present experiment investigated left/right brain dynamics in unmedicated right-handed adults with ADHD ($n = 19$) and in controls ($n = 19$), using a dichotic listening task to assess hemispheric differences in word and emotion recognition. Analysis of variance indicated that compared with controls, ADHD subjects showed reduced left hemisphere specialization, were better at processing emotions, and worse at processing words. These differences were eliminated during focused attention. During presumed right hemisphere processing of linguistic stimuli, ADHD subjects demonstrated reduced left hemisphere interference that would otherwise sort out and arrange the upcoming stimulation. The investigators concluded that ADHD subjects demonstrated greater right hemisphere and reduced left hemisphere contribution during this task relative to controls and concluded that these hemispheric differences were due to management or use of available cognitive resources rather than inherent capacity. Thus, the potential exists for a better balance of brain function through therapy.

Hypersomnia can cloud ADHD diagnosis

Hypersomnia, a type of narcolepsy, can be comorbid with adult ADHD. As one study shows, the clinician should be aware of symptom overlap, comorbidity of hypersomnias or other sleep disorders with ADHD, and possible diagnostic confusion between the 2 conditions.² That study included 67 patients with narcolepsy, 7 with idiopathic hypersomnia (IH), and 61 with ADHD. All patients completed the Epworth Sleepiness Scale and the ADHD Rating Scale. The investigators discovered that 19% of the hypersomnia patients fulfilled the self-reported criteria for ADHD in adulthood, compared with 77% of the ADHD patients. A score ≥ 12 on the Epworth Sleepiness Scale – typically used to indicate excessive daytime sleepiness – was found in 38% of the ADHD patients compared 96% of the hypersomnia patients. In ADHD patients, inattention scores correlated with the excessive daytime sleepiness score. Methylphenidate can be used to treat both ADHD and narcolepsy, although in adult ADHD, dosing is continued until bedtime and dosages may be higher. However, education and psychological treatment of the 2 conditions can differ. Patients with both hypersomnia and ADHD may be educated about the disorders and treated with stimulants, coaching and psychotherapy.

Where do adults with ADHD go for treatment?

A recent analysis of a large patient database showed that, unlike children with ADHD who are treated by primary care physicians (PCPs), adults with ADHD are primarily cared for by psychiatrists who treat them for comorbid psychiatric disorders, usually depression.³ Retrospective analyses were conducted of the National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS) over a combined 8-year period (1996-2003). This database revealed an estimated total 10.5 million ambulatory-ADHD visits, accounting for 3.5% of 301 million adult mental-health disorder visits. Adult ambulatory ADHD visits increased from a stable rate of 2% of adult mental-health disorder visits throughout 1996-1999, to 3.7% in 2000-2001, and to 6% of adult mental-health disorder visits in 2002-2003. This recent increase may be a result of a greater recognition of ADHD in children or adolescents who have maintained treatment into adulthood, adults resuming treatments that were previously effective in childhood, and/or the growing recognition of ADHD in adults with no prior diagnosis. Attention deficit hyperactivity disorder visits were most often to psychiatrists, by Caucasian men, aged 18 to 40 years. Significantly fewer ADHD visits without, versus with, psychiatric comorbidity received various treatments – behavioral (46% vs 83%), antidepressant (18% vs 66%), or combined behavioral and ADHD-specific (stimulant or atomoxetine) pharmacotherapy (36% vs 57%) respectively. However, more ADHD visits without than with psychiatric comorbidity received ADHD-specific pharmacotherapy alone (76% vs 68%) or no treatment (14% vs 6.5%). This study underscores the necessity of diagnosing and treating ADHD in an increasing adult population who may present with other psychiatric conditions.

How does adult ADHD foster overeating?

Some recent studies have reported strong associations between obesity and ADHD in adults; however, to date, scant work has focused on possible behavioral mechanisms that could explain this link. A study by Davis and colleagues analyzed a sample of healthy adult women to test the predictions that ADHD symptoms foretell aspects of overeating, including binge eating and emotionally induced eating, which in turn are positively correlated with body mass index.⁴ They proposed that the relationship between ADHD and overeating could be fostered by: 1) a diminished ability of those with ADHD to assess the future adverse health consequences of overconsumption and increased body weight; 2) a diminished tendency to wait for healthy food choices when fast food options are immediately available; and/or 3) the possibility of using comfort foods instead of pharmacologic agents, such as recreational drugs or alcohol, as a form of self-medication. Even more factors may be at play. For example, those with ADHD may be relatively inattentive to internal signals of hunger and satiety. Clinical reports indicate that many women with ADHD tend to forget about eating when they are engaged in an interesting activity and more likely to eat when they are less stimulated, at which point they may be ravenously hungry.⁵ Eating behaviors appropriate for weight control also require considerable planning, organization, and self-regulation—strategies that may be challenging for individuals with low inhibitory control.

Citations

¹ Hale TS, Zaidel E, McGough JJ, Phillips JM, McCracken JT. Atypical brain laterality in adults with ADHD during dichotic listening for emotional intonation and words. *Neuropsychologia*. 2006;44:896-904.

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³Sankaranarayanan J, Puumala SE, Kratochvil CJ. Diagnosis and treatment of adult attention-deficit/hyperactivity disorder at US ambulatory care visits from 1996 to 2003. *Curr Med Res Opin*. 2006;22:1475-1491.

⁴Davis C, Levitan RD, Smith M, Tweed S, Curtis C. Associations among overeating, overweight, and attention deficit/hyperactivity disorder: a structural equation modelling approach. *Eat Behav*. 2006;7:266-274.

⁵Fleming J, Levy L. Eating disorders in women with AD/HD. In Quinn PO, Nadeau KG, eds., *Gender Issues and AD/HD: Research, Diagnosis, and Treatment*. Silver Spring, Md: Advantage Books; 2002:411-426.

Posttest

Please select only one answer for each question. Circle the letter corresponding to the correct answer on the answer form on the next page.

- Which test evaluates how the person expresses anger when driving?
 - The Driving Anger Scale
 - The Driving Anger Expression Inventory
 - The Driver's Angry Thoughts Questionnaire
 - The Driving Self-Control Inventory
- When the driving habits of adults with ADHD were compared with those of college students, the latter group had more:
 - Moving violations
 - Major accidents
 - Minor accidents
 - All of the above
- In a study by Safren and colleagues, which of the following better controlled core ADHD symptoms?
 - Psychopharmacology
 - Cognitive-behavioral therapy
 - Psychopharmacology plus cognitive-behavioral therapy
 - Psychopharmacology plus neurobiofeedback
- What was the result of a study by Rossiter that involved neurobiofeedback versus pharmacotherapy in ADHD patients?
 - Neurobiofeedback controlled core symptoms better
 - Psychopharmacology controlled core symptoms better
 - The combination worked better than either modality alone
 - They were equally effective
- Which psychosocial ADHD treatment provides a friendly "kick in the pants" when necessary?
 - Marital counseling
 - Coaching
 - Skills management training
 - Psychoeducation
- In a study whereby the effectiveness of atomoxetine QD versus BID was assessed, which dosing schedule more significantly reduced scores on the Conners' ADHD Rating Scale-Investigator Rated: Screening Version?
 - QD
 - BID
 - The results were the same for both schedules
 - None of the above
- In a study by Weisler and associates that assessed different doses of mixed amphetamine salts extended-release, the most commonly reported adverse event was:
 - Dry mouth
 - Anorexia/decreased appetite
 - Insomnia
 - Headache
- Adults with ADHD:
 - Are right-brain dominant
 - Are left-brain dominant
 - See 2 + 2 as 4
 - See 2 + 2 as 8
- According to an analysis of a large ambulatory patient database, most patients with symptoms of ADHD:
 - Are male
 - Are black
 - Are over 50 years of age
 - See a primary care physician
- The relationship between ADHD and overeating could be fostered by:
 - A diminished ability to understand the health consequences of overeating and increased weight
 - An increased tendency to choose fast food over health food
 - Using comfort foods instead of pharmacologic agents as a form of self-medication
 - All of the above

Adult ADHD: Issues and Answers

Successful completion of the posttest examination (at least 70% correct) and activity evaluation is required to earn a maximum of .75 AMA PRA Category 1 Credits™. Statements of Credit will be awarded upon successful completion of the posttest and evaluation.

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Posttest Answer Form (Circle the correct answer to each question)	
1. A B C D	6. A B C D
2. A B C D	7. A B C D
3. A B C D	8. A B C D
4. A B C D	9. A B C D
5. A B C D	10. A B C D

To receive credit, you must answer 7 of the 10 posttest questions correctly, complete all forms, and submit them by September 30, 2007.

Registration for Credit (please print)

First Name: _____

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Specialty: _____

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ZIP: _____

State/License #: _____

Phone: _____ Fax: _____

E-mail: _____

I certify that I have completed this CME activity. The actual amount of time I spent on this activity was ____ minutes.

Signature _____ Date _____

Activity Evaluation Form

Please circle the appropriate rating in answer to the questions that follow:

- How would you rate the content of this CME activity?
 Poor 1 2 3 4 5 Outstanding
 - How relevant was the content of this activity to your practice?
 Not relevant at all 1 2 3 4 5 Very relevant
 - To what degree were you able to meet each of the learning objectives of the activity? Please respond to each learning objective listed below:
 - Identify common associated driving impairments consistent with the adult with ADHD
 Poor 1 2 3 4 5 Outstanding
 - Summarize several non-drug therapies which may assist in the treatment and management of adult ADHD
 Poor 1 2 3 4 5 Outstanding
 - Evaluate recent research publications on the treatment of adult ADHD to advance the treatment and management strategies for adult ADHD
 Poor 1 2 3 4 5 Outstanding
 - Based on your knowledge and experiences, the level of the activity was:
 Basic Appropriate Complex
 - How would you rate the activity overall?
 Poor 1 2 3 4 5 Outstanding
 - Do you believe this activity was fair, balanced, and free of commercial bias?
 - Yes No
 - If No, please state the reason:

 - How much did this activity enforce your current clinical opinions?
 Not at all 1 2 3 4 5 A lot
 - How much new information did you find in this activity?
 None 1 2 3 4 5 A lot
 - As a result of this activity, will you alter your practice?
 Yes No
 - If Yes, please describe any change(s) you plan to make:

 - How committed are you to making these changes?
 Not at all committed 1 2 3 4 5 Very committed
 - If No, why not? _____
7. Additional comments about this activity?

- Do you feel future activities on this subject matter are necessary and/or important to your practice?
 Yes No
 - Please list any other topics that would be of interest to you for future educational activities.

Adult ADHD: Issues and Answers

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