

THE MTA AT 8 YEARS: PROSPECTIVE FOLLOW-UP OF CHILDREN TREATED FOR COMBINED- TYPE ADHD IN A MULTISITE STUDY

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ABSTRACT

Objectives: To determine any long-term effects, 6 and 8 years after childhood enrollment, of the randomly assigned 14-month treatments in the NIMH Collaborative Multisite Multimodal Treatment Study of Children With Attention-Deficit/Hyperactivity Disorder (MTA; N = 436); to test whether attention-deficit/hyperactivity disorder (ADHD) symptom trajectory through 3 years predicts outcome in subsequent years; and to examine functioning level of the MTA adolescents relative to their non-ADHD peers (local normative comparison group; N = 261).

Method: Mixed-effects regression models with planned contrasts at 6 and 8 years tested a wide range of symptom and impairment variables assessed by parent, teacher, and youth report.

Results: In nearly every analysis, the originally randomized treatment groups did not differ significantly on repeated measures or newly analyzed variables (e.g., grades earned in school, arrests, psychiatric hospitalizations, other clinically relevant outcomes). Medication use decreased by 62% after the 14-month controlled trial, but adjusting for this did not change the results. ADHD symptom trajectory in the first 3 years predicted 55% of the outcomes. The MTA participants fared worse than the local normative comparison group on 91% of the variables tested.

Conclusions: Type or intensity of 14 months of treatment for ADHD in childhood (at age 7.0Y9.9 years) does not predict functioning 6 to 8 years later. Rather, early ADHD symptom trajectory regardless of treatment type is prognostic. This finding implies that children with behavioral and sociodemographic advantage, with the best response to any treatment, will have the best long-term prognosis. As a group, however, despite initial symptom improvement during treatment that is largely maintained after treatment, children with combined-type ADHD exhibit significant impairment in adolescence. Innovative treatment approaches targeting specific areas of adolescent impairment are needed.

J. Am. Acad. Child Adolesc. Psychiatry, 2009;48(5):484-500.

MEDICATION ADHERENCE IN THE MTA: SALIVA METHYLPHENIDATE SAMPLES VERSUS PARENT REPORT AND MEDIATING EFFECT OF CONCOMITANT BEHAVIORAL TREATMENT

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GLENN ELLIOTT, M.D., PH.D., AND JEFFREY H. NEWCORN, M.D.

ABSTRACT

Objective: Although research supports the use of appropriately administered stimulant medication to treat children with ADHD, poor adherence and early termination undermine the efficacy of this treatment in real-world settings. Moreover, adherence measures often rely on parent report of medication use, and their validity and reliability are unknown.

Method: Drawing on data from 254 participants in the NIMH Collaborative Multisite Multimodal Treatment Study of Children With Attention-Deficit/Hyperactivity Disorder, we examine the discrepancy between parents' verbal reports of medication adherence and physiological adherence measures determined via methylphenidate saliva assays collected at four time points during the 14-month treatment period. In addition, we examine the impact of physiologically documented medication adherence on parent- and teacher-reported outcomes through 14 months.

Results: Overall, nearly one fourth (24.5%) of the saliva samples indicated nonadherence. Among subjects, 63 (24.8%) of the 254 participants were nonadherent on 50% or more of their repeated saliva assays. Only 136 (53.5%) of the subjects were adherent at every time point at which saliva assays were taken, indicating that some degree of nonadherence characterized nearly half of all other NIMH Collaborative Multisite Multimodal Treatment Study of Children With Attention-Deficit/Hyperactivity Disorder-treated children. Findings also indicated that nonadherence produced greater deleterious effects in children in the medication-only condition compared with those receiving both medication and behavioral treatment.

Conclusions: Same-day saliva methylphenidate assays suggest that nearly half of the parents are inaccurate informants of their child's ADHD medication adherence and that parents may overestimate actual (physiological) adherence. This finding suggests the need for interventions to improve accuracy of parental report. Clinicians need to focus on adherence enhancement strategies to improve outcomes of children being treated with medication, particularly when benefits are suboptimal.

J. Am. Acad. Child Adolesc. Psychiatry, 2009;48(5):501-510.

BIBLIOGRAFIA NEWSLETTER ADHD MESE DI MAGGIO

Acta Paediatrica. 2009 Apr;98:731-36.

Effects of zinc supplementation on parent and teacher behaviour rating scores in low socioeconomic level Turkish primary school children.

Uçkardeş Y, Ozmert EN, Unal F, Yurdakök K.

Objective: To determine the effect of zinc supplementation on behaviour in low-income school aged children. Design: Double-blind randomized, placebo controlled trial.

Setting: Low-income district primary school in Turkey.

Participants: Third grade students in the school. Among 252 students, 226 participated and 218 completed the study.

Intervention: Children in each class were randomized either to the study group to receive 15 mg/day elemental zinc syrup or to placebo group to receive the syrup without zinc for 10 weeks. Main Outcome

Measures: The change in Conner's Rating Scales for Teachers and Parents scores after supplementation.

Results: The mean Conner's Rating Scale for Parents scores on attention deficit, hyperactivity, oppositional behaviour and conduct disorder decreased significantly in the study and placebo groups after supplementation ($p < 0.01$). The prevalence of children with clinically significant parent ratings on attention deficit ($p = 0.01$) and hyperactivity ($p = 0.004$) decreased in the study group while prevalence of oppositional behaviour ($p = 0.007$) decreased in the placebo group. In children of mothers with low education all mean Parents' scores decreased significantly ($p < 0.01$) in the study group while only hyperactivity scores decreased in the placebo group ($p < 0.01$). In this subgroup the prevalence of children with clinically significant scores for attention deficit, hyperactivity and oppositional behaviour decreased only in the study group ($p < 0.05$). There was no change in mean Teachers' scores.

Conclusion: In our study zinc supplementation decreased the prevalence of children with clinically significant scores for attention deficit and hyperactivity. The affect on behaviour was more evident in the children of low educated mothers.

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Pediatrics. 2009 May;123:e770-e776.

Controlled clinical trial of zolpidem for the treatment of insomnia associated with attention-deficit/hyperactivity disorder in children 6 to 17 years of age.

Blumer JL, Findling RL, Shih WJ, et al.

OBJECTIVE: The goal was to evaluate the hypnotic efficacy of zolpidem at 0.25 mg/kg per day (maximum of 10 mg/day), compared with placebo, in children 6 through 17 years of age who were experiencing insomnia associated with attention-deficit/hyperactivity disorder.

METHODS: An 8-week, North American, multicenter, double-blind, placebo-controlled, parallel-group study was conducted. Patients underwent stratification according to age (6-11 years [N = 111] or 12-17 years [N = 90]) and were assigned randomly to receive treatment with the study drug or placebo (in a 2:1 ratio). The primary efficacy variable was latency to persistent sleep between weeks 3 and 6. Secondary efficacy variables also were assessed, and behavioral and cognitive components of attention-deficit/hyperactivity disorder were monitored. Safety was assessed on the basis of reports of adverse events, abnormal laboratory data, vital signs, and physical examination findings. The potential for next-day residual effects also was assessed.

RESULTS: The baseline-adjusted mean change in latency to persistent sleep at week 4 did not differ significantly between the zolpidem and placebo groups (-20.28 vs -21.27 minutes). However, differences favoring zolpidem were observed for the older age group in Clinical Global Impression scores at weeks 4 and 8. No next-day residual effects of treatment were associated with zolpidem, and no rebound phenomena occurred after treatment discontinuation. Central nervous system and psychiatric disorders were the most-frequent treatment-emergent adverse events (>5%) that were observed more frequently with zolpidem than with placebo; these included dizziness, headache, and hallucinations. Ten (7.4%) patients discontinued zolpidem treatment because of adverse events.

CONCLUSION: Zolpidem at a dose of 0.25 mg/kg per day to a maximum of 10 mg failed to reduce the latency to persistent sleep on polysomnographic recordings after 4 weeks of treatment in children and adolescents 6 through 17 years of age who had attention-deficit/hyperactivity disorder-associated insomnia.

Am Fam Physician. 2009 Apr;79:640, 642.

Multimodal treatment of attention-deficit/hyperactivity disorder in children .

Felt BT, Lumeng J, Christner J.

J Voice. 2009 Mar;23:190-94.

Vocal characteristics in children with attention deficit hyperactivity disorder.

Hamdan AL, Deeb R, Sibai A, et al.

The aim of this study was to evaluate vocal changes in patients with attention deficit hyperactivity disorder (ADHD). Nineteen children diagnosed to have ADHD according to the Diagnostic and Statistical Manual of Mental Disorders criteria and 19 controls were enrolled in this study. They underwent vocal perceptual evaluation and acoustic analysis. Hoarseness, breathiness, strain, and loudness were graded on a scale of 0-3. The following acoustic parameters were recorded: Fundamental frequency, Shimmer, Relative average perturbation, Noise-to-Harmony ratio, Voice Turbulence Index, and Habitual pitch. Children with ADHD were perceived to have significantly more hoarseness, breathiness, and straining in their voice. They were also louder compared to controls. There were no significant changes in the acoustic parameters except for the Fundamental frequency, which was lower in the ADHD group. The vocal behavior in children with ADHD is different than controls. Early diagnosis of such behavior in this group of children is important. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Int J Psychophysiol. 2009 May;72:145-53.

Response inhibition and interference control in children with AD/HD: A visual ERP investigation.

Johnstone SJ, Barry RJ, Markovska V, et al.

Children with Attention-deficit Hyperactivity Disorder (AD/HD) show deficits in executive inhibitory functions such as behavioral inhibition and interference control, but investigations of both of these domains in the same groups of children is scarce, especially with concurrent consideration of ERP indices of inhibitory processes. Twenty children with AD/HD and 20 matched controls aged between 8 and 14 years performed visual Go's Nogo (30% Nogo) and Flanker tasks while EEG was recorded. Results indicated that children with AD/HD traded off speed for accuracy in the Go's Nogo task, resulting in similar levels of response inhibition accuracy; in the Flanker task response speed and errors were at control levels, while misses were increased and showed an enhanced interference effect. In the Go's Nogo task, the AD/HD group showed reduced Go/ Nogo P2, a reduced central N2 Nogo>Go effect, and a more anterior Go/Nogo P3 compared to controls. For the Flanker task, the AD/HD group showed delayed N1 and P2, dramatically reduced N2 to Incongruent stimuli, enhanced N2 to Neutral stimuli, as well as increased P3 to Incongruent stimuli, compared to controls. These results indicate that Go's Nogo behavioral inhibition and Flanker interference control were not equally impaired in children with AD/HD, and that factors such as effort, arousal and motivation require further investigation.

(PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Infant Behavior & Development. 2009 Apr;32:173-82.

Parenting of 7-month-old infants at familial risk for ADHD during infant's free play, with restrictions on interaction.

Landau R, Amiel-Laviad R, Berger A, et al.

Patterns of interaction of 34 mothers and fathers with their 7-month-old boys at familial risk for ADHD and 25 comparison families were studied during infant play with blocks. The parents were instructed to refrain from intervening as much as possible. Infants in the risk group did not differ from those in the comparison group in frequency of needing help or involving parents in play. Nonetheless, they received adequate responsiveness from their mothers less often than infants in the comparison group. Mothers in the risk group were also more likely not to respond to these needs at all. Mothers in the comparison group were more physically intrusive. No group difference was found for maternal rebuilding of the infant's play. No group differences were found for any of father's behaviors. However, fathers in both groups rebuilt their infant's play more frequently than mothers, infants looked at them more often, and a larger number of infants involved the father in their play. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Hong Kong Journal of Psychiatry. 2009 Mar;19:18-25.

The ability of Hong Kong children with attention-deficit hyperactivity disorder to recognise facial emotion.

Lee YK, Hung SF, Lam WC, et al.

Objectives: To evaluate the facial emotion recognition ability in local children with attention-deficit hyperactivity disorder (ADHD) and the effect of inattention and impulsivity on such ability. Participants and

Methods: Eight-seven Chinese children (45 controls and 42 with ADHD) of primary 1 to 3 were recruited. They were matched for age, sex, intelligence, and family income. The subjects were shown facial emotion pictures developed by Matsumoto and Ekman (1998) together with emotional story vignettes. Conners' Continuous Performance Test II was used to evaluate the attention/impulsivity level of the subjects.

Results: The difference in performance in facial emotion recognition between the 2 groups was not statistically significant. There was also no significant correlation between the accuracy of facial emotion recognition and the inattention/impulsivity level. Intelligence level correlated significantly with the facial emotion recognition ability.

Conclusions: The ability to recognise facial emotion is affected by multiple factors. A single diagnostic label is unlikely to be fully predictive. Further research on the influence of co-morbidities and presence of different ADHD subtypes should be considered.

(PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Neuropsychology. 2009 May;23:367-80.

Delay and reward choice in ADHD: An experimental test of the role of delay aversion.

Marco R, Miranda A, Schlotz W, et al.

Children with attention deficit/hyperactivity disorder (ADHD) choose smaller sooner (SS) over larger later (LL) rewards more than controls. Here we assess the contributions of impulsive drive for immediate rewards (IDIR) and delay aversion (DAv) to this pattern. We also explore the characteristics of, and the degree of familiarity in, ADHD SS responders. We had 360 ADHD probands; 349 siblings and 112 controls (aged between 6 to 17 years) chose between SS (1 point after 2 s) and LL reward (2 points after 30 s) outcomes on the Maudsley Index of Delay Aversion (Kuntsi, Oosterlaan, & Stevenson, 2001): Under one condition SS choice led to less overall trial delay under another it did not. ADHD participants chose SS more than controls under both conditions. This effect was larger when SS choice reduced trial delay. ADHD SS responders were younger, had lower IQ, more conduct disorder and had siblings who were more likely to be SS responders themselves. The results support a dual component model in which both IDIR and DAv contribute to SS choice in ADHD. SS choice may be a marker of an ADHD motivational subtype.

(PsycINFO Database Record (c) 2009 APA, all rights reserved). (from the journal abstract)

MMW Fortschr Med. 2009 Feb;151:16.

[Therapy of ADHD. British institute recommends: drugs only in severe cases].

Matthis M.

Am Fam Physician. 2009 Apr;79:640, 642.

Multimodal treatment of attention-deficit/hyperactivity disorder in children .

Felt BT, Lumeng J, Christner J.

Pediatrics. 2009 May;123:e770-e776.

Controlled clinical trial of zolpidem for the treatment of insomnia associated with attention-deficit/hyperactivity disorder in children 6 to 17 years of age.

Blumer JL, Findling RL, Shih WJ, et al.

OBJECTIVE: The goal was to evaluate the hypnotic efficacy of zolpidem at 0.25 mg/kg per day (maximum of 10 mg/day), compared with placebo, in children 6 through 17 years of age who were experiencing insomnia associated with attention-deficit/hyperactivity disorder.

METHODS: An 8-week, North American, multicenter, double-blind, placebo-controlled, parallel-group study was conducted. Patients underwent stratification according to age (6-11 years [N = 111] or 12-17 years [N = 90]) and were assigned randomly to receive treatment with the study drug or placebo (in a 2:1 ratio). The primary efficacy variable was latency to persistent sleep between weeks 3 and 6. Secondary efficacy variables also were assessed, and behavioral and cognitive components of attention-deficit/hyperactivity disorder were monitored. Safety was assessed on the basis of reports of adverse events, abnormal

laboratory data, vital signs, and physical examination findings. The potential for next-day residual effects also was assessed.

RESULTS: The baseline-adjusted mean change in latency to persistent sleep at week 4 did not differ significantly between the zolpidem and placebo groups (-20.28 vs -21.27 minutes). However, differences favoring zolpidem were observed for the older age group in Clinical Global Impression scores at weeks 4 and 8. No next-day residual effects of treatment were associated with zolpidem, and no rebound phenomena occurred after treatment discontinuation. Central nervous system and psychiatric disorders were the most-frequent treatment-emergent adverse events (>5%) that were observed more frequently with zolpidem than with placebo; these included dizziness, headache, and hallucinations. Ten (7.4%) patients discontinued zolpidem treatment because of adverse events.

CONCLUSION: Zolpidem at a dose of 0.25 mg/kg per day to a maximum of 10 mg failed to reduce the latency to persistent sleep on polysomnographic recordings after 4 weeks of treatment in children and adolescents 6 through 17 years of age who had attention-deficit/hyperactivity disorder-associated insomnia.

J Pediatr Psychol. 2009 Apr;34:328-37.

ADHD subtypes and comorbid anxiety, depression, and oppositional-defiant disorder: Differences in sleep problems.

Mayes SD, Calhoun SL, Bixler EO, et al.

Objective: Sleep problems were analyzed in children with ADHD (Attention-deficit hyperactivity disorder).

Methods: Scales were completed by parents of 135 control children and 681 children with ADHD combined type (ADHD-C) or inattentive type (ADHD-I) with or without comorbid oppositional defiant disorder (ODD), anxiety, or depression.

Results: Children with ADHD-I alone had the fewest sleep problems and did not differ from controls. Children with ADHD-C had more sleep problems than controls and children with ADHD-I. Comorbid anxiety/depression increased sleep problems, whereas ODD did not. Daytime sleepiness was greatest in ADHD-I and was associated with sleeping more (not less) than normal. Medicated children had greater difficulty falling asleep than unmedicated children.

Conclusions: Differences in sleep problems were found as a function of ADHD subtype, comorbidity, and medication.

(PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Pediatrics. 2009 May;123:e857-e864.

Short sleep duration and behavioral symptoms of attention-deficit/hyperactivity disorder in healthy 7- to 8-year-old children.

Paavonen EJ, Raikkonen K, Lahti J, et al.

OBJECTIVE: It has been hypothesized that sleep deprivation may manifest in children as behavioral symptoms rather than as tiredness, but only a few studies have investigated this hypothesis. The objective of our study was to evaluate whether short sleep is associated with behavioral symptoms of attention-deficit/hyperactivity disorder in 7- to 8-year-old children.

METHODS: We performed a cross-sectional study of children born in 1998 in Helsinki, Finland. The participants included 280 (146 girls, 134 boys) children with a mean age of 8.1 years (SD: 0.3; range: 7.4-8.8). Sleep quality was measured by using actigraphs. The Sleep Disturbance Scale for Children and the Attention-Deficit/Hyperactivity Disorder Rating Scale IV were administered to parents.

RESULTS: Children whose average sleep duration as measured by actigraphs was short (<10th percentile, ie, <7.7 hours) and had a higher hyperactivity/impulsivity score (9.7 vs 7.8 or 7.5) and a higher attention-deficit/hyperactivity disorder total score (17.3 vs 14.5 or 13.1) but a similar inattention score (7.6 vs 6.7 or 5.6) compared with children sleeping 7.7 to 9.4 hours or >9.4 hours. In multivariate statistical models, short sleep duration remained a statistically significant predictor of hyperactivity/impulsivity, and sleeping difficulties were associated with hyperactivity/impulsivity, inattention, and the total score. There were no significant interactions between short sleep and sleeping difficulties.

CONCLUSIONS: Children's short sleep duration and sleeping difficulties increase the risk for behavioral symptoms of attention-deficit/hyperactivity disorder.

Sleep: Journal of Sleep and Sleep Disorders Research. 2009 Apr;32:530-35.

Children show individual night-to-night variability of periodic limb movements in sleep.

Picchiatti MA, Picchiatti DL, England SJ, et al.

Study Objective: Several studies have documented the occurrence of significant night-to-night variability of periodic limb movements in sleep (PLMS) in adults. The aim of this study was to investigate the night-to-night variability of PLMS in children.

Design and Measurements: Two to 4 nights of polysomnography were performed as part of a multisite, placebo-controlled study investigating the effects of carbidopa/levodopa on attention-deficit/hyperactivity disorder in children who were not taking other medications that impacted the central nervous system. Baseline polysomnograms from all children and endpoint polysomnograms from children who were randomly assigned to a placebo group were scored using International Restless Legs Syndrome Study Group criteria for PLMS. PLMS indexes from 101 sleep studies of 36 children, aged 7 to 12 years, were compared. Interventions: N/A.

Results: For all 36 children as a group, PLMS index on Night 1 was predictive of PLMS index on Night 2 (odds ratio 7.0, 95% confidence interval 1.4-38.4), suggesting that overall diagnostic classification (PLMS index above or below 5/h) was accurate. In addition, for the 15 children with 5 or more PLMS per hour on either night, there was no significant group difference on Night 1 versus Night 2 for mean PLMS index (10.6 vs 8.5/h, $P = 0.92$) or chance of having 5 or more PLMS per hour, indicating no first-night effect. When looking at individual data, however, 9 of these 15 children (60%) had PLMS indexes over and under the 5 per hour cutoff on these 2 nights. Of these 15, 10 had clinical diagnoses of restless legs syndrome and 5 of periodic limb movement disorder (PLMD). The PLMS indexes of all children who were medication free for a third and fourth night ($n = 7$) or just a third night ($n = 2$) and had not shown a PLMS index of 5 or greater on either of the first 2 nights remained under this threshold.

Conclusions: In this sample of children, considerable individual night-to-night variability of PLMS indexes was observed. This finding has important clinical relevance for the diagnosis of restless legs syndrome and PLMD and may have an impact on future studies that correlate individual PLMS severity with frequently associated symptoms, such as negative affect, fatigue, and inattention. Our data, however, also suggest that individual PLMS variability is random and not likely to skew the group-level analysis of treatment outcome studies.

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Neuropsychology. 2009 May;23:381-91.

Attention problems, inhibitory control, and intelligence index overlapping genetic factors: A study in 9-, 12-, and 18-year-old twins.

Polderman TJC, de Geus EJC, Hoekstra RA, et al.

It is assumed that attention problems (AP) are related to impaired executive functioning. We investigated the association between AP and inhibitory control and tested to what extent the association was due to genetic factors shared with IQ. Data were available from 3 independent samples of 9-, 12-, and 18-year-old twins and their siblings (1,209 participants). AP were assessed with checklists completed by multiple informants. Inhibitory control was measured with the Stroop Color Word Task (Stroop, 1935), and IQ with the Wechsler Intelligence Scale for Children (Wechsler et al., 2002) or Wechsler Adult Intelligence Scale (Wechsler, 1997). AP and inhibitory control were only correlated in the 12-year-old cohort ($r = .18$), but appeared non-significant after controlling for IQ. Significant correlations existed between AP and IQ in 9- and 12-year olds ($r = .26$ and $.34$). Inhibitory control and IQ were correlated in all cohorts ($r = .16$, $.24$ and $.35$, respectively). Genetic factors that influenced IQ also influenced inhibitory control. We conclude that the association between AP and inhibitory control as reported in the literature may largely derive from genetic factors that are shared with IQ.

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Ugeskr Laeger. 2009 Apr;171:1500-04.

[Danish standardization of the attention deficit hyperactivity disorder rating scale].

Poulsen L, Jorgensen SL, Dalsgaard S, et al.

INTRODUCTION: Attention deficit hyperactivity disorder (ADHD) is characterized by inattention, hyperactivity and impulsivity. The diagnostic classification is based on developmental anamnesis, objective examination, neuropsychological tests, observation of the child, and evaluation of the symptoms from rating scales.

MATERIAL AND METHODS: The internationally known ADHD rating scale (ADHD-RS) has been translated into Danish and representative norm data from teachers and parents were collected. A total of 1,718 ADHD-RS questionnaires were distributed to 859 anonymous school children, aged 6-17 years, and a total of 1,477 ADHD-RS questionnaires were returned. Analyses were made on 781 children, 420 boys and 361 girls.

RESULTS: The average participation rate was 99.5% for teachers and 72.4% for parents. The factor structure was supported and internal consistency was high. The normative scores were calculated for both girls and boys in three age-groups, for parent answers and teacher answers separately.

CONCLUSION: There were significant variations in ratings of ADHD and behavioural symptoms as a function of gender and age. It is crucial, during an evaluation of a child, to compare his or her scores to gender- and age-stratified normative data. Standardized normative ADHD-RS data from school children is now available and can be implemented in a national quality database within child and adolescent mental health services. The questionnaire can support the diagnostic classification, measure symptom-load and evaluate outcome of treatment of ADHD.

Am Fam Physician. 2009 Apr;79:657-65.

Current strategies in the diagnosis and treatment of childhood attention-deficit/hyperactivity disorder.

Rader R, McCauley L, Callen EC.

Symptoms of childhood attention-deficit/hyperactivity disorder affect cognitive, academic, behavioral, emotional, social, and developmental functioning. Attention-deficit/hyperactivity disorder is the most commonly diagnosed neurodevelopmental disorder in children and adolescents. An estimated 2 to 16 percent of school-aged children have been diagnosed with the disorder. The prevalence of attention-deficit/hyperactivity disorder in the primary care setting is similar to that in the general community, depending on the diagnostic criteria and population studied. The causality of attention-deficit/hyperactivity disorder is relatively unknown. Most recent studies focus on the role of dopamine; norepinephrine; and, most recently, serotonin neurotransmitters. The disorder is classified into three general subtypes: predominantly hyperactive-impulsive, predominantly inattentive, and combined. Screening tools and rating scales have been devised to assist with the diagnosis. Appropriate treatment can dramatically improve the function and quality of life of the patient and family. Pharmacologic treatment includes stimulants, such as methylphenidate and mixed amphetamine salts, or nonstimulants, such as atomoxetine. Behavioral approaches, particularly those that reward desirable behavior, are also effective. A combination of pharmacologic and behavioral therapies is recommended.

Journal of Child & Adolescent Substance Abuse. 2009 Apr;18:172-92.

Drug use and psychosocial functioning of a community-derived sample of adolescents with childhood ADHD.

Realmuto GM, Winters KC, August GJ, et al.

We describe the late adolescent psychosocial outcomes from a relatively large, community-identified sample of children with ADHD who have been assessed longitudinally from childhood through late adolescence. A range of outcomes were compared between ADHD (n = 119) and normal control (n = 93) groups, as well as ADHD subgroups that varied as a function of the course of externalizing predominantly ODD problems (persisters, desisters, escalators, and resisters). ADHD youths that did not show externalizing problems during childhood (ADHD resisters) were associated with drug use outcomes generally comparable to the normal non-affected controls. All other ADHD groups with externalizing problems (ADHD persisters, ADHD escalators, and ADHD desisters) consistently revealed worse drug use outcomes compared to controls/ADHD resisters. However, ADHD youths with or without externalizing problems showed worse outcomes compared to the control group on the non-drug, psychosocial functioning variables. The study highlights that ADHD with coexisting disruptiveness, whether the disruptiveness persists or remits before adolescence, is associated with an increased risk for drug involvement and that ADHD, regardless of the comorbid pattern, confers a poorer level of psychosocial functioning.

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Pediatrics. 2009 May;123:1273-79.

Positive association between attention-deficit/ hyperactivity disorder medication use and academic achievement during elementary school.

Scheffler RM, Brown TT, Fulton BD, et al.

OBJECTIVE: Approximately 4.4 million (7.8%) children in the United States have been diagnosed with attention-deficit/hyperactivity disorder, and 56% of affected children take prescription medications to treat the disorder. Attention-deficit/hyperactivity disorder is strongly linked with low academic achievement, but the association between medication use and academic achievement in school settings is largely unknown. Our objective was to determine if reported medication use for attention-deficit/hyperactivity disorder is positively associated with academic achievement during elementary school.

METHOD: To estimate the association between reported medication use and standardized mathematics and reading achievement scores for a US sample of 594 children with attention-deficit/hyperactivity disorder, we used 5 survey waves between kindergarten and fifth grade from the nationally representative Early Childhood Longitudinal Study--Kindergarten Class of 1998-1999 to estimate a first-differenced regression model, which controlled for time-invariant confounding variables.

RESULTS: Medicated children had a mean mathematics score that was 2.9 points higher than the mean score of unmedicated peers with attention-deficit/hyperactivity disorder. Children who were medicated for a longer duration (at >2 waves) had a mean reading score that was 5.4 points higher than the mean score of unmedicated peers with attention-deficit/hyperactivity disorder. The medication-reading association was lower for children who had an individualized education program than for those without such educational accommodation.

CONCLUSIONS: The finding of a positive association between medication use and standardized mathematics and reading test scores is important, given the high prevalence of attention-deficit/hyperactivity disorder and its association with low academic achievement. The 2.9-point mathematics and 5.4-point reading score differences are comparable with score gains of 0.19 and 0.29 school years, respectively, but these gains are insufficient to eliminate the test-score gap between children with attention-deficit/hyperactivity disorder and those without the disorder. Long-term trials are needed to better understand the relationship between medication use and academic achievement

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