



ADHD

ATTENTION DEFICIT HYPERACTIVITY DISORDER


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J Natl Med Assoc. 2008;100:579-80.

Guanfacine effective for attention-deficit/hyperactivity disorder, but side effects are significant.

Anon.

Guanfacine (Intuniv) is a pharmacologic relative of clonidine (Catapres(registered trademark)). These central alpha-agonists are used as alternatives to stimulants. In this multicenter U.S. study, researchers identified 345 patients between the ages of 6-17 years with ADHD combined subtype (77%), predominantly inattentive subtype or predominantly hyperactive-impulse subtype of average intelligence. The average score at the beginning of the study was 38 of a possible 54 on the ADHD Rating Scale IV, a clinician-administered questionnaire answered by parents. The children were randomly assigned (concealed allocation uncertain) to receive placebo or 2 mg, 3 mg or 4 mg per day of guanfacine for eight weeks. Guanfacine dosages were started at 1 mg per day and increased by 1 mg per day until the assigned dose was reached (though neither the children nor the investigators were aware of the increase). Thirty-eight percent of children dropped out by the end of the study, which limits our confidence in applying the results to other children. The authors state their analysis was by intention to treat, but it was actually an on-protocol analysis. At the end of four weeks of the assigned dose, the scores of children receiving placebo improved by an average of 8.9 points; the scores of the children receiving the active drug improved an average of 16.2-18.9 points. Differences were most pronounced in children aged 6-8 years, and scores were not significantly different in older children. Results were similar in all ADHD subtypes. There was a dose-related increase in children stopping treatment because of side effects: 10% at the low dose, increasing to 23% in the 4-mg group.

Psychiatr Q. 2008;79:133-37.

Both atomoxetine and stimulants improve quality of life in an ADHD population treated in a community clinic.

Bastiaens L.

Objective: To evaluate change in quality of life in a community clinic ADHD population treated with atomoxetine or stimulants. No direct comparisons between atomoxetine and stimulants to improve quality of life in ADHD are available.

Methods: A prospective, nonrandomized comparison between ADHD patients treated with atomoxetine or stimulants in one clinic. Structured diagnostic assessment tools and a specific quality of life measure were used.

Results: 84 patients (atomoxetine n = 39/stimulants n = 45), between the ages of 5 and 18, were treated for approximately 8 months. At end point, there were no significant differences in improvements of quality of life between the two groups. Age, participation in psychotherapy, and parental disability were not correlated with quality of life changes. Patients with lower baseline scores improved most.

Conclusions: Both atomoxetine and stimulants led to a modest increase in quality of life in this community clinic ADHD population.

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Per la ricerca degli articoli pubblicati nella letteratura scientifica nel mese in esame sono state consultate le banche dati Medline, Embase e PsycINFO utilizzando le seguenti parole chiave (o i loro sinonimi): 'Attention deficit disorder', 'Attention deficit hyperactivity disorder', 'Infant', 'Child', 'Adolescent', 'Human'. Sono qui riportate le referenze considerate rilevanti e pertinenti.

Am J Psychiatry. 2008;165:107-15.

Familial risk analyses of attention deficit hyperactivity disorder and substance use disorders.

Biederman J, Petty CR, Wilens TE, et al.

Objective: A robust and bidirectional comorbidity between attention deficit hyperactivity disorder (ADHD) and psychoactive substance use disorder (alcohol or drug abuse or dependence) has been consistently reported in the extant literature.

Method: First-degree relatives from a large group of pediatrically and psychiatrically referred boys with (112 probands, 385 relatives) and without (105 probands, 358 relatives) ADHD were comprehensively assessed by blind raters with structured diagnostic interviews. Familial risk analysis examined the risks in first-degree relatives for ADHD, psychoactive substance use disorder, alcohol dependence, and drug dependence after stratifying probands by the presence and absence of these disorders.

Results: ADHD in the proband was consistently associated with a significant risk for ADHD in relatives. Drug dependence in probands increased the risk for drug dependence in relatives irrespective of ADHD status, whereas alcohol dependence in relatives was predicted only by ADHD probands with comorbid alcohol dependence. In addition, ADHD in the proband predicted drug dependence in relatives, and drug dependence in comparison probands increased the risk for ADHD in relatives. Both alcohol dependence and drug dependence bred true in families without evidence for a common risk between these disorders.

Conclusions: Patterns of familial risk analysis suggest that the association between ADHD and drug dependence is most consistent with the hypothesis of variable expressivity of a common risk between these disorders, whereas the association between ADHD and alcohol dependence is most consistent with the hypothesis of independent transmission of these disorders. Findings also suggest specificity for the transmission of alcohol and drug dependence.

Psychological Assessment. 2008 Jun;20:121-30.

Invariance and convergent and discriminant validity between mothers' and fathers' ratings of oppositional defiant disorder toward adults, ADHD-HI, ADHD-IN, and academic competence factors within Brazilian, Thai, and American children.

Burns GL, de Moura MA, Walsh JA, et al.

Confirmatory factor analysis was used to test the invariance of an oppositional defiant disorder toward adults, attention-deficit/hyperactivity disorder-hyperactivity/impulsivity, attention-deficit/hyperactivity disorder-inattention, and an Academic Competence factor model between mothers' and fathers' ratings within Brazilian (n = 894), Thai (n = 2,075), and American (n = 817) children with the Child and Adolescent Disruptive Behavior Inventory (G. L. Burns, T. Taylor, & J. Rusby, 2001a, 2001b).

The results showed invariance of item loadings, intercepts, and residuals, as well as factor variances, covariances, and means between mothers' and fathers' ratings within each sample. Convergent and discriminant validity was also observed for the between-parent factor correlations, thus providing additional support for the construct validity of the Child and Adolescent Disruptive Behavior Inventory. The confirmatory factor analysis invariance procedure provides a much better way to examine between-source ratings of behavior problems in children than do the simple correlation and raw discrepancy score procedures. (PsycINFO Database Record (c) 2008 APA, all rights reserved) (from the journal abstract).

Rev Neurol. 2008;46:S51-S54.

Soft neurological signs: Are they of any value in the assessment and diagnosis of attention deficit hyperactivity disorder?

Cardo E, Casanovas S, De La Banda G, et al.

Introduction. The association between difficulties on motor skills, visual-hand coordination and excess motor activity was described previously of being established the attention-deficit/hyperactivity disorder (ADHD) as a diagnostic category. These disorders have been grouped under different terminologies, being one of them the soft neurological signs (SNS). Traditionally, the European scientific community has put more attention on the SNS than the American one. However, nowadays there are a lot of neuropsychiatrician and community pediatrician that continue to think that those deficits, together with inattention and hyperactivity, form part of the same disorder.

Development. In this article we have tried to do a neurobiological revision of the movement and the possible relationship between motor problems and cognitive processes from different points of view: neuroanatomical, findings on different clinical examination tests and neuropsychological experimental models.

Conclusion. Most of the revised articles conclude that the SNS prevalence is greater in ADHD children compared with control. Therefore we recommend to include the SNS in the evaluation and diagnosis protocols of these disorders in order to improve the sensitivity and specificity of the diagnosis and to be able to evaluate the real needs of the ADHD patients. (copyright) 2008, Revista de Neurologia.

Int J Psychophysiol. 2008 Jun;68:186-92.

Effects of imipramine hydrochloride on the EEG of children with Attention-Deficit/Hyperactivity Disorder who are non-responsive to stimulants.

Clarke AR, Barry RJ, McCarthy R, et al.

Although stimulant medications are the most commonly-used treatments for Attention-Deficit/Hyperactivity Disorder (AD/HD), as many as 20% of treated children do not respond clinically to stimulants. One non-stimulant medication that has been widely used when the stimulants fail is a tricyclic antidepressant, imipramine hydrochloride. This study investigated the effects of imipramine on the EEG of children with AD/HD who were poor responders to dexamphetamine and ritalin, but who showed clinical improvement on a six month trial of imipramine. An initial premedication EEG was recorded during an eyes-closed resting condition, with data Fourier transformed to provide absolute and relative power estimates for the delta, theta, alpha and beta bands. A second EEG was recorded at the end of the imipramine trial. Compared to controls, the unmedicated AD/HD children had significant global increases in absolute and relative theta, with decreased global absolute and relative alpha, increased posterior relative delta, and decreased posterior absolute beta. No change in the EEG was found as a result of administering the medication. These results suggest that good responders to imipramine have an underlying EEG abnormality different from that in children who respond to the stimulants, and that an initial pre-treatment EEG may be useful in selecting a trial medication. However, as no change in the EEG was found with imipramine, it is unlikely that the EEG will be useful in evaluating responsiveness to this medication. (PsycINFO Database Record (c) 2008 APA, all rights reserved) (from the journal abstract).

Nutr J. 2008;7.

Fatty acid status and behavioural symptoms of attention deficit hyperactivity disorder in adolescents: A case-control study.

Colter AL, Cutler C, Meckling KA.

Background. Most studies of Attention-deficit hyperactivity disorder (ADHD) have focused on either young children or older adults. The current study compared 11 ADHD adolescents with 12 age-matched controls. The purpose was to examine differences in dietary intake, particularly of essential fatty acids, and determine whether this could explain the typical abnormalities in red blood cell fatty acids observed in previous studies of young children. A secondary purpose was to determine if there were relationships between circulating concentrations of essential fatty acids and specific ADHD behaviours as measured by the Conners' Parent Rating Scale (CPRS-L).

Methods. Eleven ADHD adolescents and twelve age-matched controls were recruited through newspaper ads, posters and a university website. ADHD diagnosis was confirmed by medical practitioners according to DSM-IV criteria. Blood, dietary intake information as well as behavioural assessments were completed.

Results. Results showed that ADHD adolescents consumed more energy and fat than controls but had similar anthropometry. ADHD children consumed equivalent amounts of omega-3 and omega-6 fatty acids to controls, however they had significantly lower levels of docosahexaenoic acid (DHA, 22:6n-3) and total omega-3 fatty acids, higher omega-6 fatty acids and a lower ratio of n-3:n-6 fatty acids than control subjects. In addition, low omega-3 status correlated with higher scores on several Conners' behavioural scales.

Conclusion. These data suggest that adolescents with ADHD continue to display abnormal essential fatty acid profiles that are often observed in younger children and distinctly different from normal controls of similar age. Further these red blood cell fatty acid differences are not explained by differences in intake. This suggests that there are metabolic differences in fatty acid handling between ADHD adolescents and normal controls. The value of omega-3 supplements to improve fatty acid profiles and possibly behaviours associated with ADHD, need to be examined.

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Clin Ther. 2008;30:182-89.

Donepezil use in children and adolescents with tics and attention-deficit/hyperactivity disorder: An 18-week, single-center, dose-escalating, prospective, open-label study.

Cubo E, Fernandez Jaen A, Moreno C, et al.

Background: Striatal cholinergic dysfunction may be important in tics and attention-deficit/hyperactivity disorder (ADHD).

Objective: The purpose of this study was to determine the safety profile of donepezil and whether it improves chronic tics in young patients with comorbid ADHD.

Methods: This 18-week (14 weeks of open treatment followed by a 4-week washout period), single-center, dose-escalating, prospective, open-label trial was conducted in patients aged 7 to 17 years with tics, including chronic motor or vocal tics and Tourette's syndrome, and ADHD. Patients were treated with once-daily oral donepezil doses of 2.5 mg for 2 weeks, 5 mg for the next 6 weeks, and 10 mg for the last 6 weeks, followed by a 4-week washout period. Patients were evaluated using the Children's Global Assessment Scale; the Yale Global Tic Severity Scale (YGTSS); the Revised Conners' Parent Rating Scale; the Symbol and Digit Wisconsin Card Sorting Test; the Stroop black/white, color, and interference tests; the Rey Complex Figure Test; and the Children's Yale-Brown Obsessive Compulsive Scale at 4 visits: baseline, week 8 (5-mg dose), week 14 (10-mg dose), and week 18 (washout).

Results: Seventeen males and 3 females (mean [SD] age, 11.3 [1.9] years [range, 8-14 years]; tic duration, 5.3 [1.9] years; ADHD duration, 6.5 [1.7] years) were included in this study. Tics were significantly reduced at the 10-mg (week-14) donepezil visit compared with the baseline and washout visits based on the total mean (SD) tic score of the YGTSS (18.6 [9.3] vs 12.2 [11.0]; $P = 0.006$). Fifty percent of patients withdrew and 65% experienced adverse events.

Conclusions: These preliminary results suggest that donepezil significantly reduced tics in these children and adolescents with comorbid ADHD who completed the study. No significant improvement in the symptoms of comorbid ADHD was found with the use of donepezil 10 mg. Donepezil 5 and 10 mg were not well tolerated in these children and adolescents.

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Arch Gen Psychiatry. 2008;65:586-94.

Abnormal ventromedial prefrontal cortex function in children with psychopathic traits during reversal learning.

Finger EC, Marsh AA, Mitchell DG, et al.

Context: Children and adults with psychopathic traits and conduct or oppositional defiant disorder demonstrate poor decision making and are impaired in reversal learning. However, the neural basis of this impairment has not previously been investigated. Furthermore, despite high comorbidity of psychopathic traits and attention-deficit/hyperactivity disorder, to our knowledge, no research has attempted to distinguish neural correlates of childhood psychopathic traits and attention-deficit/hyperactivity disorder.

Objective: To determine the neural regions that underlie the reversal learning impairments in children with psychopathic traits plus conduct or oppositional defiant disorder.

Design: Case-control study.

Setting: Government clinical research institute.

Participants: Forty-two adolescents aged 10 to 17 years: 14 with psychopathic traits and oppositional defiant disorder or conduct disorder, 14 with attention-deficit/hyperactivity disorder only, and 14 healthy controls.

Main Outcome Measure: Blood oxygenation level-dependent signal as measured via functional magnetic resonance imaging during a probabilistic reversal task.

Results: Children with psychopathic traits showed abnormal responses within the ventromedial prefrontal cortex (Brodmann area 10) during punished reversal errors compared with children with attention-deficit/hyperactivity disorder and healthy children ($P < .05$ corrected for multiple comparisons).

Conclusions: To our knowledge, this study provides the first evidence of abnormal ventromedial prefrontal cortex responsiveness in children with psychopathic traits and demonstrates this dysfunction was not attributable to comorbid attention-deficit/hyperactivity disorder. These findings suggest that reversal learning impairments in patients with developmental psychopathic traits relate to abnormal processing of reinforcement information.

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Clin Neurophysiol. 2008;119:1281-91.

Long-term deficits of preterm birth: Evidence for arousal and attentional disturbances.

Hall RW, Huitt TW, Thapa R, et al.

Objective: Quantitative measures of pre-attentional, attentional and frontal lobe processes were compared to evaluate quantitative measures of these deficits in Ex-Preterm vs. Ex-Term adolescents.

Methods: We compared 43 Ex-Preterm with 26 Ex-Term adolescents using the P50 auditory potential, the Psychomotor Vigilance Task (PVT), a reaction time (RT) test, and Near Infrared Spectroscopy (NIRS).

Results: The mean amplitude ((plus or minus)SE) of the P50 amplitude was similar in the Ex-Preterm (1.8 (plus or minus) 1.4 (mu)V) vs. Ex-Term adolescents (1.8 (plus or minus) 0.6 (mu)V, $df = 68$, $F = 0.05$, $p = 0.8$), but the Ex-Preterm group showed a trimodal distribution in amplitude (High, 3.3 (plus or minus) 0.4 (mu)V, $df = 42.25$, $F = 19.2$, $p < 0.01$; Medium, 1.7 (plus or minus) 0.1 (mu)V, $df = 39$, $F = 0.41$, $p = 0.53$; Low, 0.7 (plus or minus) 0.1 (mu)V, $df = 40$, $F = 49.5$, $p < 0.01$) suggested by statistically significant variance between populations (Kolmogorov-Kuiper test, $df = 42.25$, $F = 5.4$, $p < 0.01$). Mean RT was longer in Ex-Preterm (250 (plus or minus) 8 ms) vs. Ex-Term subjects (200 (plus or minus) 5 ms, $df = 68$, $F = 18.8$, $p < 0.001$). PVT lapses were increased in Ex-Preterm subjects, and varied inversely with P50 amplitude (Overall Mean 17 (plus or minus) 5 lapses, $df = 67$, $F = 5.34$, $p < 0.05$; Low P50 amplitude, 25 (plus or minus) 10, $df = 40$, $F = 8.8$, $p < 0.01$; Medium, 21 (plus or minus) 11, $df = 38$, $F = 5.37$, $p < 0.05$; High, 6 (plus or minus) 2, $df = 39$, $F = 6.78$, $p < 0.01$) vs. Ex-Term subjects (2 (plus or minus) 0.4 lapses, $p < 0.01$). NIRS levels did not differ statistically, but tended to correlate with P50 amplitude in the Ex-Preterm group.

Conclusions: These findings suggest differential pre-attentional, attentional and frontal lobe dysfunction in Ex-Preterm adolescents.

Significance: These measures could provide a means to objectively assess differential dysregulation of arousal and attention in Ex-Preterm adolescents, allowing optimization of therapeutic designs.

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Dev Med Child Neurol. 2008;50:462-66.

Response switching process in children with attention-deficit-hyperactivity disorder on the novel continuous performance test.

Inoue Y, Inagaki M, Gunji A, et al.

We examined the effects of previous trials on subsequent trials on performance in the continuous performance test (CPT) in children with attention-deficit-hyperactivity disorder (ADHD). Thirty-five non-medicated children with ADHD (31 males, four females; mean age 9y 10mo [SD 2y 4mo]) and 33 comparison children (20 males, 13 females; mean age 10y [SD 2y 7mo]) were tested using a novel CPT, in which stimuli were presented with 50% target probability. Reaction time, reaction time variability, omission, and commission error rate were analyzed for two different types of trials in which different responses (switched trials) or the same responses (repeated trials) were required for two consecutive trials. Compared with the comparison group, children with ADHD showed a greater increase in commission error rate from repeated to switched trials, i.e. increased switch cost for commission error rate. On the other hand, omission error rate was not influenced by the previous trial in both ADHD and comparison groups. These results suggest that children with ADHD have trouble in response switching when an inhibitory process is involved. (copyright) 2008 Blackwell Publishing Ltd.

Indian J Pediatr. 2008;75:223-28.

Impact of parent and teacher concordance on diagnosing attention deficit hyperactivity disorder and its sub-types.

Malhi P, Singhi P, Sidhu M.

Objective. This study examines the extent to which parents and teachers agree on the diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) and its subtypes, as per the DSM IV criteria. It assesses whether the extent of agreement between informants improves by making the ADHD criteria more flexible.

Methods. Parents and teachers of 119 clinic-referred sample of children (mean age=8.4 years, S.D= 2.48) with disruptive behavioral symptoms completed the Vanderbilt Attention Deficit Hyperactivity Disorder Diagnostic Parent and Teacher Rating Scales, respectively. Concordance of parent and teacher reports for the presence or absence of diagnosis of ADHD and type of ADHD was examined by percent agreement and the kappa statistics.

Results. Of the 119 children referred for disruptive behavior disorders, 96 (80.6%) met criteria for any type of ADHD according to the parents' report; and only 68 (57.1%) met criteria according to the teachers' report. Parent and teacher agreement for the diagnosis of any type of ADHD was only 52% ($k = .11$, n.s); and the agreement regarding diagnosis of sub-type was even poorer. Making the criteria more flexible vis-a-vis impairment or number of symptoms did not improve agreement between the informants.

Conclusion. Clear guidelines are needed to reconcile the differences between informants in order to promote uniform diagnostic practices among clinicians working with children having ADHD.

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BMC Psychiatry. 2008;8.

ADHD and Disruptive behavior scores - Associations with MAO-A and 5-HTT genes and with platelet MAO-B activity in adolescents.

Malmberg K, Wargelius HL, Lichtenstein P, et al.

Background: Pharmacological and genetic studies suggest the importance of the dopaminergic, serotonergic, and noradrenergic systems in the pathogenesis of Attention Deficit Hyperactivity Disorder (ADHD) and Disruptive Behavior Disorder (DBD). We have, in a population-based sample, studied associations between dimensions of the ADHD/DBD phenotype and Monoamine Oxidase B (MAO-B) activity in platelets and polymorphisms in two serotonergic genes: the Monoamine Oxidase A Variable Number of Tandem Repeats (MAO-A VNTR) and the 5-Hydroxytryptamine Transporter gene-Linked Polymorphic Region (5-HTT LPR).

Methods: A population-based sample of twins, with an average age of 16 years, was assessed for ADHD/DBD with a clinical interview; Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL). Blood was drawn from 247 subjects and analyzed for platelet MAO-B activity and polymorphisms in the MAO-A and 5-HTT genes.

Results: We found an association in girls between low platelet MAO-B activity and symptoms of Oppositional Defiant Disorder (ODD). In girls, there was also an association between the heterozygote long/short 5-HTT LPR genotype and symptoms of conduct disorder. Furthermore the heterozygote 5-HTT LPR genotype in boys was found to be associated with symptoms of Conduct Disorder (CD). In boys, hemizygoty for the short MAO-A VNTR allele was associated with disruptive behavior.

Conclusion: Our study suggests that the serotonin system, in addition to the dopamine system, should be further investigated when studying genetic influences on the development of Disruptive Behavior Disorders. (copyright) 2008 Malmberg et al; licensee BioMed Central Ltd.

Am J Psychiatry. 2008;165:604-09.

Age of methylphenidate treatment initiation in children with ADHD and later substance abuse: Prospective follow-up into adulthood.

Mannuzza S, Klein RG, Truong NL, et al.

Objective: Animal studies have shown that age at stimulant exposure is positively related to later drug sensitivity. The purpose of this study was to examine whether age at initiation of stimulant treatment in children with attention deficit hyperactivity disorder (ADHD) is related to the subsequent development of substance use disorders.

Method: The authors conducted a prospective longitudinal study of 176 methylphenidate-treated Caucasian male children (ages 6 to 12) with ADHD but without conduct disorder. The participants were followed up at late adolescence (mean age=18.4 years; retention rate=94%) and adulthood (mean age=25.3; retention rate=85%). One hundred seventy-eight comparison subjects also were included. All subjects were diagnosed by blinded clinicians. The Cox proportional hazards model included the following childhood predictor variables: age at initiation of methylphenidate treatment, total cumulative dose of methylphenidate, treatment duration, IQ, severity of hyperactivity, socioeconomic status, and lifetime parental psychopathology. Separate models tested for the following four lifetime outcomes: any substance use disorder, alcohol use disorder, non-alcohol substance use disorder, and stimulant use disorder. Other outcomes included antisocial personality, mood, and anxiety disorders.

Results: There was a significant positive relationship between age at treatment initiation and non-alcohol substance use disorder. None of the predictor variables accounted for this association. Post hoc analyses showed that the development of antisocial personality disorder explained the relationship between age at first methylphenidate treatment and later substance use disorder. Even when controlling for substance use

disorder, age at stimulant treatment initiation was significantly and positively related to the later development of antisocial personality disorder. Age at first methylphenidate treatment was unrelated to mood and anxiety disorders.

Conclusions: Early age at initiation of methylphenidate treatment in children with ADHD does not increase the risk for negative outcomes and may have beneficial long-term effects.

Behav Neurosci. 2008;122:273-81.

Masculinized Finger-Length Ratios of Boys, but Not Girls, Are Associated With Attention-Deficit/Hyperactivity Disorder.

Martel MM, Gobrogge KL, Breedlove SM, et al.

Gonadal hormones may exert permanent organizational effects on sexually dimorphic finger-length ratios and sexually dimorphic behavior expressed in childhood attention deficit-hyperactivity disorder (ADHD). This study extended recent work examining associations between finger-length ratios (specifically, 2D:4D) and ADHD in a well-characterized, clinically diagnosed, community-recruited sample of boys and girls. A multistage, diagnostic procedure was utilized to identify 113 children with ADHD and 137 non-ADHD comparison children. Right-hand digit ratios showed significant mean differences by gender, as well as associations with ADHD diagnosis. Boys with ADHD had more masculinized digit ratios than control-group boys. More masculine right 2D:4D and 3D:4D ratios were correlated with parent- and teacher-rated inattentive and hyperactive-impulsive symptoms in boys but not in girls. Masculinized finger-length ratios were associated with hyperactive-impulsive and oppositional-defiant symptoms, but associations were largest with symptoms of inattention. It is concluded that prenatal, organizational effects of gonadal hormones may play a role in the development of ADHD and contribute to explaining sex differences in the prevalence rates of this childhood disorder. (copyright) 2008 American Psychological Association.

Acta Ophthalmol Scand. 2008;86:259-64.

Visual fields in children with attention-deficit/hyperactivity disorder before and after treatment with stimulants.

Martin L, Aring E, Landgren M, et al.

Purpose: This study aimed to evaluate visual function in children with attention-deficit/hyperactivity disorder (ADHD), to correlate these data with the morphology of the optic nerve, and to find out if and how psychostimulant medication affects visual functions.

Methods: The visual acuity (VA) and visual fields (VFs) of 18 children with ADHD (two girls and 16 boys), aged 6-17 years, were examined before and after treatment with psychostimulants. A control group, consisting of 24 children (nine girls and 15 boys), aged 7-18 years, were examined twice to evaluate the repeatability of the tests and the learning effect. Fundus photographs were analysed by digital planimetry.

Results: Visual acuity increased significantly ($p=0.0039$) in the ADHD group after treatment. The difference between the two VF examinations was significantly larger in the ADHD group compared with the control group ($p=0.036$). Significantly more ADHD subjects had subnormal VF results without stimulants, compared with controls ($p=0.0043$), but with stimulants the difference was no longer significant.

Conclusion: Children with ADHD showed better VA and VF results with than without psychostimulant medication.

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Ambul Pediatr. 2008;8:175-81.

Child Characteristics and Receipt of Stimulant Medications: A Population-Based Study.

Miller AR, Kohen D, Johnston C.

Objective: Predictive factors associated with prescription of psychostimulant drugs to children remain poorly understood. We aimed to identify child-related factors that predict receipt of methylphenidate (MPH: Ritalin) by children in a large population-based study.

Methods: With data from time 1 (1994-1995) and time 2 (1996-1997) of the National Longitudinal Survey of Children and Youth, we analyzed the role of child background, and behavioral and functional characteristics, all measured at time 1, in predicting receipt of MPH at time 2 in a series of logistic regression models.

Results: Parent- and teacher-reported attention-deficit/hyperactivity disorder (ADHD) symptoms were consistent and significant predictors of receipt of MPH (odds ratios [ORs] ranging from 5.3-7.0, and from 3.2-4.1, respectively), particularly when concordant. Parent-reported aggressive behaviors (OR 1.91, 95% confidence interval [CI], 1.24-2.96) and teacher-reported internalizing symptoms (OR 3.01, 95% CI, 1.74-5.54) also predicted receipt of MPH, whereas higher levels of academic functioning predicted lower likelihood of receiving MPH (OR 0.54, 95% CI, 0.34-0.85), even after controlling for child background characteristics, ADHD symptoms, and prior receipt of MPH. Across models, male gender predicted a higher likelihood of receiving MPH (ORs ranging from 3.5-4.5) over and above ADHD and other behavioral symptoms. The strongest predictor of MPH receipt across models was prior receipt of MPH (ORs ranging from 83.7-128.3).

Conclusions: Child characteristics and behavioral symptoms other than ADHD symptoms predict prescription and uptake of MPH, possibly attributable to their serving as clinically convenient indicators of impairment. Gender effects in receipt of stimulant medications among children with ADHD symptoms warrant further investigation.

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Encephale. 2008;34:161-69.

Development of self-regulation and inhibition in children exhibiting attention deficit disorder with or without hyperactivity (ADHD).

Poissant H, Neault I, Dallaire S, et al.

Introduction: Self-regulation shares several affinities with executive functions. However, the specificity of self-regulation deficits in attention deficit/hyperactivity disorder (ADHD) remains unclear. The typical child starts around the age of four to develop a self-control mechanism along with an internal language that allows the child to modulate impulsively. Conversely, a child with ADHD seems to have greater difficulties delaying or retaining an action or response.

Objective: In this study we aim to evaluate self-regulation of comprehension in ADHD.

Results: Our results show that children with ADHD fail to recognize inconsistencies in presented stories at a rate ranging between 72 (eight years) and 54% (ten years). We also found a positive correlation between a better control of self-regulation and our behavioral inhibition measurement. The attentional deficits exhibited through markedly longer reaction times to continuous performance test (CPT) could be responsible for a poor ability to self-regulate. Fast reaction times were found to be associated with increased vigilance/attention that in turn would permit better self-regulation. Furthermore, our findings show that older subjects with ADHD have shorter reaction times to CPT approaching this group to the typical children.

Discussion: This suggests that improvement overtime in self-regulation processes may be attributed to the associated development of vigilance/attention in children with ADHD. Improved vigilance/attention would result in optimal reaction times during tasks that require self-regulation. In addition, our findings suggest that subjects with ADHD have developmental trajectories similar to those observed in healthy subjects.

Conclusion: In the present study, the lack of a comparison group does not allow us to conclude if such trajectory is delayed compared to typical subjects. Finally, there was no significant relation between the degree of intelligence and the rate of self-regulation, which makes it possible to distinguish the two functions. However, in ADHD self-regulation is favourably influenced by age as observed in developmental studies on typical children. Thus, maturation independent of intelligence, influences self-regulation processes. (copyright) 2008.

Psiquiatr Biol. 2008;15:59-62.

Attention deficit disorder with hyperactivity and bipolar disorder. A case report of dizygotic twins.

Real Lopez M, Massana MP, Marin LR.

Since Wozniak et al reported a high prevalence rate (16%) of bipolar disorder (BP) among children and adolescents diagnosed with attention-deficit-hyperactivity-disorder (ADHD), interest in the study and description of both disorders has increased. At the same time, there is some confusion (and possibly some lack of awareness among psychiatrists) surrounding correct differential diagnosis between these disorders. Attempts have been made to clarify the relationship (both clinical and genetic) between these two disorders. Equally, the diagnoses have been validated and the characteristic symptoms have been defined. We report the cases of two dizygotic twin sisters, which reveal the existence of the above-mentioned associations and

the role of inheritability in BP. In addition, we believe that the presence of an ADHD in a child with Turner syndrome child is highly unusual.

Journal of the American Academy of Child & Adolescent Psychiatry. 2008 Jun;47:662-72.

Co-occurrence of motor problems and autistic symptoms in attention-deficit/hyperactivity disorder.
Reiersen AM, Constantino JN, Todd RD.

Objective: To investigate the relation between parent reports of motor problems and clinically significant autistic symptoms in children with and without attention-deficit/hyperactivity disorder (ADHD).

Method: Subjects were male (n = 521) and female (n = 330) twins from an epidemiological study of ADHD, ages 7 to 19 years at assessment using the Child Behavior Checklist and semistructured psychiatric diagnostic interviews. Parent-rated Social Responsiveness Scale questionnaires were returned for 62% of 1,647 individuals who participated in interviews. After exclusion of subjects with incomplete data or evidence of mental retardation, 851 subjects (52%) were available for the present study analysis. Each subject was classified by DSM-IV ADHD subtype and assigned to one of seven population-defined ADHD subtypes based on latent class analysis of DSM-IV ADHD symptoms. Within each ADHD subtype, we examined the relation between Child Behavior Checklist motor problem endorsement and elevated autistic symptoms on the Social Responsiveness Scale.

Results: Motor problems and high levels of autistic traits were most common in individuals with combined-type ADHD. Within each of the clinically relevant DSM-IV and latent class ADHD subtypes, individuals with the combination of motor problems and ADHD were more likely to have high levels of autistic traits than those with ADHD alone.

Conclusions: Children with the combination of ADHD and parent-reported motor coordination deficits have elevated levels of autistic symptoms. Targeted treatment and prevention interventions may be warranted. The exclusion criteria for DSM-IV ADHD should be revised to reflect these population-based findings. (PsycINFO Database Record (c) 2008 APA, all rights reserved) (from the journal abstract).

J Psychiatr Res. 2008;42:644-52.

Externalizing disorders in the offspring from the San Diego prospective study of alcoholism.

Schuckit MA, Smith TL, Pierson J, et al.

Object: Conduct disorder (CD) and attention deficit hyperactivity disorder (ADHD) may be more prevalent in relatives of alcoholics and may predict alcohol and drug problems, but not all studies agree. This paper evaluates these questions in well-educated families of alcoholics and controls.

Methods: Data from 165, 14-25-year-old offspring in the San Diego Prospective Study were used to create Group 1 (n = 17) with CD or ADHD and Group 2 (n = 148) with no such diagnoses. Correlations and hierarchical logistic regressions evaluated characteristics associated with these disorders, comparing the impact of CD and ADHD.

Results: The rates of CD (6.1%) and of ADHD (4.8%) were not strikingly elevated, and did not relate to the family history of alcohol or drug use disorders. Group 1 offspring were more likely to have divorced parents, a relative with bipolar disorder, a higher intake of alcohol and illicit substances, and associated problems. (copyright) 2007 Elsevier Ltd. All rights reserved.

Neuropsychology. 2008;22:329-40.

Executive Functioning in Children With Attention-Deficit/Hyperactivity Disorder: Combined Type With and Without a Stimulant Medication History.

Semrud-Clikeman M, Pliszka S, Liotti M.

Behavioral and neuropsychological functioning in unmedicated children with attention-deficit/hyperactivity disorder (ADHD) who have a history of medication treatment (Rx) versus those who are treatment naive (TN) has, to our knowledge, not been previously studied. Ninety-four children in four groups (ADHD/Rx, ADHD/TN, learning disabilities [LD], and controls) were evaluated, while unmedicated, on measures of achievement, neuropsychological functioning, and behavior. The ADHD/Rx group performed significantly better than the TN group on writing, Stroop interference, and measures of attention, and performed as well as the control group on executive functioning, verbal working memory, and academics. Behaviorally, the

ADHD groups showed more difficulty with mood and externalizing behaviors compared with the LD and control groups, with the ADHD/TN performing the most poorly. Findings suggest that the ADHD/Rx group shows better executive and academic functioning even when unmedicated.
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Eur Child Adolesc Psychiatry. 2008;17:63-72.

Do hyperactivity, impulsivity and inattention have an impact on the ability of facial affect recognition in children with autism and ADHD?

Sinzig J, Morsch D, Lehmkuhl G.

Psychopathological, genetic and neuropsychological findings indicate an association between autism and attention deficit/hyperactivity disorder (ADHD). The goal of this study was to assess possible differences in facial affect recognition in children with autism (with and without comorbid ADHD), with ADHD and healthy controls. Children aged 6-18 years old with DSM-IV-diagnosis ADHD (n = 30) or autism (n = 40) were included consecutively in the study. Facial affect recognition was assessed with a computer-based program used for teaching emotion processing called the Frankfurt Test and Training of Social Affect (FEFA) using faces and eye-pairs as target material. Additionally three attention-tasks (Sustained attention, Inhibition, Set-Shifting) were administered. Approximately 52% of the autistic children met the criteria for the comorbid diagnosis of ADHD. A MANOVA with post-hoc Scheffe tests revealed a significant difference in the recognition of faces and eye pairs between the group ADHD and controls (P = 0.009). Children with autism and ADHD also differed significantly from healthy participants in the recognition of eye-pairs (P = 0.009). Neither correlations with PDD nor with ADHD symptom scores were able to explain these results. Sustained attention and inhibition deficits had a significant influence on emotion recognition in children with ADHD. Our findings imply that the ability of facial affect recognition is reduced in children suffering from ADHD symptoms, both in autistic and pure ADHD children. ADHD symptoms need to be taken into account in future studies assessing emotion recognition in autistic children and adolescents.
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Child Adolesc Psychiatry Ment Health. 2008;2.

Inhibition, flexibility, working memory and planning in autism spectrum disorders with and without comorbid ADHD-symptoms.

Sinzig J, Morsch D, Bruning N, et al.

Background: Recent studies have not paid a great deal of attention to comorbid attention-deficit/hyperactivity disorder (ADHD) symptoms in autistic children even though it is well known that almost half of children with autism spectrum disorder (ASD) suffer from hyperactivity, inattention and impulsivity. The goal of this study was to evaluate and compare executive functioning (EF) profiles in children with ADHD and in children with ASD with and without comorbid ADHD.

Methods: Children aged 6 to 18 years old with ADHD (n = 20) or ASD (High-Functioning autism or Asperger syndrome) with (n = 20) and without (n = 20) comorbid ADHD and a typically developing group (n = 20) were compared on a battery of EF tasks comprising inhibition, flexibility, working memory and planning tasks. A MANOVA, effect sizes as well as correlations between ADHD-symptomatology and EF performance were calculated. Age- and IQ-corrected z scores were used.

Results: There was a significant effect for the factor group (F = 1.55; dF = 42; p = .02). Post-hoc analysis revealed significant differences between the ADHD and the TD group on the inhibition task for false alarms (p = .01) and between the ADHD group, the ASD+ group (p = .03), the ASD- group (p = .02) and the TD group (p = .01) for omissions. Effect sizes showed clear deficits of ADHD children in inhibition and working memory tasks. Participants with ASD were impaired in planning and flexibility abilities. The ASD+ group showed compared to the ASD- group more problems in inhibitory performance but not in the working memory task.

Conclusion: Our findings replicate previous results reporting impairment of ADHD children in inhibition and working memory tasks and of ASD children in planning and flexibility abilities. The ASD + group showed similarities to the ADHD group with regard to inhibitory but not to working memory deficits. Nevertheless the heterogeneity of these and previous results shows that EF assessment is not useful for differential diagnosis between ADHD and ASD. It might be useful for evaluating strengths and weaknesses in individual children.
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Psychiatry Res. 2008;159:346-58.

Blinded, multi-center validation of EEG and rating scales in identifying ADHD within a clinical sample.

Snyder SM, Quintana H, Sexson SB, et al.

Previous validation studies of attention deficit/hyperactivity disorder (ADHD) assessment by rating scales or EEG have provided Class-IV evidence per standards of the American Academy of Neurology. To investigate clinical applications, we collected Class-I evidence, namely from a blinded, prospective, multi-center study of a representative clinical sample categorized with a clinical standard. Participating males (101) and females (58) aged 6 to 18 had presented to one of four psychiatric and pediatric clinics because of the suspected presence of attention and behavior problems. DSM-IV diagnosis was performed by clinicians assisted with a semi-structured clinical interview. EEG (theta/beta ratio) and ratings scales (Conners Rating Scales-Revised and ADHD Rating Scales-IV) were collected separately in a blinded protocol. ADHD prevalence in the clinical sample was 61%, whereas the remainder had other childhood/adolescent disorders or no diagnosis. Comorbidities were observed in 66% of ADHD patients and included mood, anxiety, disruptive, and learning disorders at rates similar to previous findings. EEG identified ADHD with 87% sensitivity and 94% specificity. Rating scales provided sensitivity of 38-79% and specificity of 13-61%. While parent or teacher identification of ADHD by rating scales was reduced in accuracy when applied to a diverse clinical sample, theta/beta ratio changes remained consistent with the clinician's ADHD diagnosis. Because theta/beta ratio changes do not identify comorbidities or alternative diagnoses, the results do not support the use of EEG as a stand-alone diagnostic and should be limited to the interpretation that EEG may complement a clinical evaluation for ADHD.

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European Child & Adolescent Psychiatry. 2008 Jun;17:245-54.

Heterogeneity in the pharmacodynamics of two long-acting methylphenidate formulations for children with attention deficit/hyperactivity disorder: A growth mixture modelling analysis.

Sonuga-Barke EJS, Van Lier P, Swanson JM, et al.

Objectives: To use growth mixture modelling (GMM) to identify subgroups of children with attention deficit hyperactive disorder (ADHD) who have different pharmacodynamic profiles in response to extended release methylphenidate as assessed in a laboratory classroom setting.

Methods: GMM analysis was performed on data from the COMACS study (Comparison of Methylphenidates in the Analog Classroom Setting): a large (n = 184) placebo-controlled cross-over study comparing three treatment conditions in the Laboratory School Protocol (with a 1.5-h cycle of attention and department assessments). Two orally administered, once-daily methylphenidate (MPH) bioequivalent formulations [Metadate CD, Equasym, XL (MCD-EQXL) and Concerta XL (CON)] were compared with placebo (PLA).

Results: Three classes of children with distinct severity profiles in the PLA condition were identified. For both MCD-EQXL and CON, the more severe their PLA symptoms the better, the children's response. However, the formulations produced different growth curves by class, with CON having essentially a flat profile for all three classes (i.e. no effect of PLA severity) and MCD-EQXL showing a marked decline in symptoms immediately post-dosing in the two most severe classes compared with the least severe. Comparison of daily doses matched for immediate-release (IR) components accounted for this difference.

Conclusion: The results suggest considerable heterogeneity in the pharmacodynamics of MPH response by children with ADHD. When treatment response for near-equal, bioequivalent daily doses the two formulations was compared, marked differences were seen for children in the most severe classes with a strong curvilinear trajectory for MCD-EQXL related to the greater IR component.

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Braz J Med Biol Res. 2008;41:250-57.

A randomized crossover clinical study showing that methylphenidate-SODAS improves attention-deficit/hyperactivity disorder symptoms in adolescents with substance use disorder.

Szobot CM, Rohde LA, Katz B, et al.

Our objective was to evaluate the effectiveness of a long-acting formulation of methylphenidate (MPH-SODAS) on attention-deficit/ hyperactivity disorder (ADHD) symptoms in an outpatient sample of adolescents with ADHD and substance use disorders (SUD). Secondary goals were to evaluate the

tolerability and impact on drug use of MPH-SODAS. This was a 6-week, single-blind, placebo-controlled crossover study assessing efficacy of escalated doses of MPH-SODAS on ADHD symptoms in 16 adolescents with ADHD/SUD. Participants were randomly allocated to either group A (weeks 1-3 on MPH-SODAS, weeks 4-6 on placebo) or group B (reverse order). The primary outcome measures were the Swanson, Nolan and Pelham Scale, version IV (SNAP-IV) and the Clinical Global Impression Scale (CGI). We also evaluated the adverse effects of MPH-SODAS using the Barkley Side Effect Rating Scale and subject reports of drug use during the study. The sample consisted of marijuana (N = 16; 100%) and cocaine users (N = 7; 43.8%). Subjects had a significantly greater reduction in SNAP-IV and CGI scores (P < 0.001 for all analyses) during MPH-SODAS treatment compared to placebo. No significant effects for period or sequence were found in analyses with the SNAP-IV and CGI scales. There was no significant effect on drug use. MPH-SODAS was well tolerated but was associated with more severe appetite reduction than placebo (P < 0.001). MPH-SODAS was more effective than placebo in reducing ADHD symptoms in a non-abstinent outpatient sample of adolescents with comorbid SUD. Randomized clinical trials, with larger samples and SUD intervention are recommended.

Am J Clin Nutr. 2008;87:1170-80.

Correlation between changes in blood fatty acid composition and visual sustained attention performance in children with inattention: Effect of dietary n-3 fatty acids containing phospholipids.

Vaisman N, Kaysar N, Zaruk-Adasha Y, et al.

Background: Increasing evidence supports n-3 fatty acid (FA) supplementation for patients with psychiatric disorders, such as attention deficit hyperactivity disorder. However, the exact metabolic fate of dietary eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) on different glyceride carriers remains unclear.

Objective: We investigated whether conjugation of EPA and DHA to phospholipid (PL-n-3) or to triacylglycerol (fish oil; FO) affects their incorporation in blood compartments and influences executive functioning.

Design: Children aged 8-13 y with impaired visual sustained attention performance received placebo, 250 mg/d EPA + DHA esterified to PL-n-3 (300 mg/d phosphatidylserine), or FO for 3 mo in a randomized double-blind manner. Main outcome measures included plasma and erythrocyte FA profile and continuous performance test results (Test of Variables of Attention; TOVA).

Results: Sixty of the 83 children enrolled completed the interventions (n = 18-21 per group). There was an enrichment of EPA (1.5-2.2-fold), docosapentaenoic acid (DPA; 1.2-fold), and DHA (1.3-fold) in the PL fraction in the plasma of FO- and PL-n-3-fed children. In erythrocytes, only PL-n-3 resulted in a significant reduction ((almost equal to)30%) of very-long-chain saturated FAs (C20-24) and in an increase (1.2- and 2.2-fold, respectively) in linoleic acid and DPA. Total TOVA scores increased in the PL-n-3 (x (plus or minus) SD: 3.35 (plus or minus) 1.86) and FO (1.72 (plus or minus) 1.67) groups but not in the placebo group (-0.42 (plus or minus) 2.51) (PL-n-3 -> FO >- placebo; P < 0.001). A significant correlation between the alterations in FAs and increased TOVA scores mainly occurred in the PL-n-3 group.

Conclusion: Consumption of EPA+DHA esterified to different carriers had different effects on the incorporation of these FAs in blood fractions and on the visual sustained attention performance in children. This trial was registered at clinicaltrials.gov as NCT00382616.

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Eur Child Adolesc Psychiatry. 2008;17:73-81.

Treatment of attention deficit hyperactivity disorder in children: Predictors of treatment outcome.

Van der Oord S, Prins PJM, Oosterlaan J, et al.

Objective: The present study investigated the predictive power of anxiety, IQ, severity of ADHD and parental depression on the outcome of treatment in children with ADHD.

Method: Fifty children with ADHD (ages 8-12) were randomized to a 10-week treatment of methylphenidate or to a treatment of methylphenidate combined with multimodal behavior therapy. Prior to treatment predictors were assessed. Outcome was assessed separately for parents and teachers on a composite measure of inattentive, hyperactive, oppositional- and conduct disorder symptoms.

Results: There was neither a significant difference between the two treatments at baseline nor did treatment condition predict outcome. Therefore the data were collapsed across the two treatments. A combination of anxiety and IQ predicted teacher-rated outcome, explaining 18% of the variance. Higher anxiety and higher IQ's indicated better treatment outcome. There were no significant predictors of the parent-rated outcome.

Conclusions: This study showed a small but significant predictive effect of IQ and anxiety on treatment outcome in children with ADHD. Clinical Clinical: This study supports the idea that for the treatment of ADHD children with comorbid anxiety and higher IQ respond better to the two most used treatments for ADHD. (copyright) 2007 Steinkopff Verlag.

Rev Neurol. 2008;46:S37-S41.

Clinical assessment of attention deficit hyperactivity disorder, interview model and controversial issues.

Vaquerizo-Madrid J.

Introduction. Attention deficit hyperactivity disorder (ADHD) is one of the most frequent reasons for visits to neuropaediatric services. Although the clinical criteria are well established, the medical history is probably not examined with enough care and the most decisive symptoms go unnoticed.

Aim. To review a clinical interview model by analysing the first visit of a sample of patients.

Patients and methods. Our sample consisted of 108 schoolchildren with ADHD whose first visit was to a clinic specialised in hyperactivity and learning difficulties. The most significant data were families' concern about academic achievement, the higher prevalence of the combined subtype of ADHD in girls and age at the visit, with a growing demand for health care during the preschool stage and after the teenage period.

Results. The data obtained define a familial scenario or model of ADHD where there is a mixture of the symptoms of the parents, their occupational situation, that of their partner and the ADHD phenotype of the schoolchild we are dealing with.

Conclusions. More attention must be paid to the neurodevelopmental period in the preschool stage. Language, which is the most affected area, is the foundation underlying both behaviour and socialisation. Their delayed development, together with the lack of interest in games and clumsiness, is among the features that have been identified for ADHD in small children. Interpreting temperament and explosive behaviour as difficulties hindering social learning is another of the considerations that can be deduced from this clinical research.

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Child Adolesc Psychiatry Ment Health. 2008;2.

Global impression of perceived difficulties in children and adolescents with attention-deficit/hyperactivity disorder: Reliability and validity of a new instrument assessing perceived difficulties from a patient, parent and physician perspective over the day.

Wehmeier PM, Schacht A, Dittmann RW, et al.

Background: The objective of this analysis was to evaluate the psychometric properties of a brief scale developed to assess the degree of difficulties in children with Attention-Deficit/Hyperactivity Disorder (ADHD). The Global Impression of Perceived Difficulties (GIPD) scale reflects overall impairment, psychosocial functioning and Quality of Life (QoL) as rated by patient, parents and physician at various times of the day.

Methods: In two open-label studies, ADHD-patients aged 6-17 years were treated with atomoxetine (target-dose 0.5-1.2 mg/kg/day). ADHD-related difficulties were assessed up to week 24 using the GIPD. Data from both studies were combined to validate the scale.

Results: Overall, 421 patients received atomoxetine. GIPD scores improved over time. All three GIPD-versions (patient, parent, physician) were internally consistent; all items showed at least moderate item-total correlation. The scale showed good test-retest reliability over a two-week period from all three perspectives. Good convergent and discriminant validity was shown.

Conclusion: GIPD is an internally consistent, reliable and valid measure to assess difficulties in children with ADHD at various times of the day and can be used as indicator for psychosocial impairment and QoL. The scale is sensitive to treatment-related change.

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Journal of the American Academy of Child & Adolescent Psychiatry. 2008 Jun;47:700-08.

Varying the wear time of the methylphenidate transdermal system in children with attention-deficit/hyperactivity disorder.

Wilens TE, Boellner SW, Lpez FA, et al.

Objective: Children with attention-deficit/hyperactivity disorder often have varying needs for coverage of their symptoms throughout the day. The objectives of this study were to determine the efficacy, duration of action, and safety of methylphenidate transdermal system worn for variable times by children (ages 6-12) diagnosed with ADHD.

Method: Methylphenidate dose was optimized over 5 weeks using 10-, 15-, 20-, or 30-mg patches worn for 9 hours. The efficacy of 4- and 6-hour wear times was then assessed in an Analog Classroom setting during a randomized, placebo-controlled, double-blind, three-way crossover phase. The main efficacy measures were the Swanson, Kotkin, Agler, M-Flynn, and Pelham Rating Scale department scale and the Permanent Product Measure of Performance math test.

Results: All of the efficacy measures indicated that 4- and 6-hour wear times improved ADHD symptoms and that medication effects on the Swanson, Kotkin, Agler, M-Flynn, and Pelham Rating Scale department scale and Permanent Product Measure of Performance math test decreased between 2 and 4 hours after patch removal. The majority of adverse events were transient and mild to moderate in severity.

Conclusions: These findings suggest that the duration of medication effect is related to the wear time of the patch and may be tailored to accommodate the schedules of patients.

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