The Preschool Attention-Deficit/Hyperactivity Disorder Treatment Study (PATS) 6-Year Follow-Up

Mark A. Riddle, M.D., Kseniya Yershova, Ph.D., Deborah Lazzaretto, M.S., Natalya Paykina, M.A., Gayane Yenokyan, Ph.D., Laurence Greenhill, M.D., Howard Abikoff, Ph.D., Benedetto Vitiello, M.D., Tim Wigal, Ph.D., James T. McCracken, M.D., Scott H. Kollins, Ph.D., Desiree W. Murray, Ph.D., Sharon Wigal, Ph.D., Elizabeth Kastelic, M.D., James J. McGough, M.D., Susan dosReis, Ph.D., Audrey Bauzó-Rosario, M.A., Annamarie Stehl, M.P.H., Kelly Posner, Ph.D.

Accepted 18 December 2012. published online 26 December 2012.

Abstract

Objective
To describe the clinical course of attention-deficit/hyperactivity disorder (ADHD) symptom severity and diagnosis from ages 3 to 5 up to 9 to 12 years during a 6-year follow-up after the original Preschool ADHD Treatment Study (PATS).

Method
A total of 207 participants (75% male) from the original PATS, assessed at baseline (mean age, 4.4 years, when all met criteria for ADHD) and 3 months later (before medication treatment), were re-evaluated in three follow-up assessment visits (year 3, mean age 7.4 years; year 4, 8.3 years; and year 6, 10.4 years). Parents and teachers rated symptom severity, and clinicians established psychiatric diagnoses. Analyses examined longitudinal changes in symptom severity and ADHD diagnosis.

Results
Parent- and teacher-rated symptom severity decreased from baseline to year 3 but remained relatively stable and in the moderate-to-severe clinical range through year 6. Girls showed generally steeper decreases in symptom T-scores. At year 6, 89% (160/180) of remaining participants met ADHD symptom and impairment diagnostic criteria. Comorbidity of oppositional defiant disorder and/or conduct disorder was associated with a 30% higher risk of having an ADHD diagnosis at year 6 in the multiple logistic model. Medication status during follow-up, on versus off, did not predict symptom severity change from year 3 to year 6 after adjustment for other variables.

Conclusions
ADHD in preschoolers is a relatively stable diagnosis over a 6-year period. The course is generally chronic, with high symptom severity and impairment, in very young children with moderate-to-severe ADHD, despite treatment with medication. Development of more effective ADHD intervention strategies is needed for this age group.

Key Words: attention-deficit/hyperactivity disorder (ADHD), follow-up, development
This research was supported by a cooperative agreement between NIMH and the following institutions: Duke University Medical Center (U01MH60848), Johns Hopkins University (U01 MH60642), New York University Child Study Center (U01 MH60943), NYSPI/Columbia University (U01 MH60603), University of California–Irvine (U01 MH60833), and UCLA (U01 H60900).

The opinions and assertions contained in this report are the private view of the authors and are not to be construed as official or as reflecting the views of NIMH, the National Institutes of Health (NIH), or the Department of Health and Human Services.

This article is discussed in an editorial by Dr. Mary Margaret Gleason on page 228.

Supplemental material cited in this article is available online.

Dr. Yenokyan served as the statistical expert for this research.

The Preschool Attention-Deficit/Hyperactivity Disorder Treatment Study (PATS) Study Group includes the above named authors plus the following list of collaborators: Allan Chrisman, M.D., Kathryn Gustafson, Ph.D., and Rebecca McIntyre, M.A., of Duke University; Shauna Reinblatt, M.D., Kyla Machell, Luke Mason, Erin Santana, and Yesel Yoon of Johns Hopkins University; Lori Evans, Ph.D., Jim Robinson, M.Ed. (Nathan Kline Institute), Emily Madsen, and Matthew Schrock of New York University; S.A. Shen, Ph.D., Patricia Santos, and Jennifer Uhlimann of NYSPI/Columbia University; Pearl Rosenbach, Ph.D., James Swanson, Ph.D., Lillian Swords, Ph.D., Audrey Kapelinski, and Sabrina Schuck of the University of California–Irvine; and Jennifer Cowen, Ph.D., and Melissa Del'Homme of UCLA.

Disclosure: Dr. Riddle has received salary from Johns Hopkins University, research support from NIH and the Maryland Mental Hygiene Administration, consultation fees from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), and has received anipirazole from Bristol Myers Squibb for an NIMH-sponsored study. Dr. Yershova has received salary from the Research Foundation for Mental Hygiene at the New York State Institute. Ms. Faykina has received support through her employer, Research Foundation for Mental Hygiene, Inc., at NYSPI. Dr. Posner has received salary from Johns Hopkins University and research funding from NIH. Dr. Greenhill has received salary support from NYSPI via the New York State Office of Mental Health, as well as salary support from Columbia University. He has received research support from NIDA as well as from Shire Pharmaceuticals and BioBehavioral Diagnostics. Dr. Abbott has received salary from New York University School of Medicine, research support from NIMH and NIDA, and royalties from Multi-Health Systems and Premier/School Specialty. Dr. Vitiello has received salary from NIH, income from medical private practice, and consultation fees from the American Psychiatric Institute for Advanced Professional Studies. Dr. T. Wigal has received salary support from University of California–Irvine, research support from NIDA, Shire, Noven, and Forest, and has served as a consultant for Purdue Pharmaceuticals. Dr. McCracken has received salary support from UCLA and has received research support from NIH, Seaside Therapeutics, Roche, and Otsuka; consultant income from Novartis, BioMarin, PharmaNet, and Noven; speaker’s honoraria from the Tourette Syndrome Association; and research study drug supply from Shire. Dr. Kollins has received salary support from Duke University and has received research support from Addrenex, NIDA, Otsuka, Rhodes, and Shire. He has been consulting fees from Addrenex, NIH/Center for Scientific Review, Otsuka, Rhodes, and Shire. Dr. Murray has received research salary support from Duke University and has received funding from the Institute of Educational Sciences, NIDA, and Idaho Years, Inc. Dr. S. Wigal has received salary support from University of California–Irvine and research support from Forest, Addrenex, Eli Lilly and Co., McNeil, Next Wave, NICHHD, Noven, Psychogenics, Quintiles, Rhodes, Shionogi Pharma, Otsuka, and Shire. She has served as a consultant for Eli Lilly and Co., McNeil, Next Wave, NIH, NuTec, Shire, Noven, and TAISHO; and on the speakers’ bureaus of Shionogi and Noven. Dr. Kastelic has received salary from Johns Hopkins University. Dr. McGough has received salary support from UCLA; consulting honoraria from Alexza Pharmaceuticals, MedImmune, Shionogi, Sunovion, Tharavance, and Targacept; and research support from NIH, NeuroSigma Inc., Shionogi, Shire, and Supemus Pharmaceuticals. Dr. dosReis has received salary from the University of Maryland and research support from NIH and the Centers for Medicare and Medicaid Services (CMS). Ms. Bauso-Rosario has received salary from Nathan Kline Institute. Ms. Stahl has received funding support from NICHD and NIDA. Dr. Posner has received salary support from the Research Foundation for Mental Hygiene (RFMH). She has served as the director of the Center for Suicide Risk Assessment which, as part of an effort to help execute the Food and Drug Administration (FDA) suicidality classification mandates. She has received support from Abbott, Albany Molecular Research, Al fresa, Alkermes, Amgen, AstraZeneca Pharmaceuticals, Bodelivery Sciences, Int., Biomarin, Bristol-Monts Squibb, Canam, Catol Research, Cephalon, Cetero Research, Covance, CRI Worldwide, Depomed, Douglas Pharmaceuticals, Eisai, Euthymics, Forest Laboratories, GlaxoSmithKline, GW Pharma, Human Genome Sciences, 3, Research, ICON, InteliGenx Corp., Intracelular Therapies, Johnson and Johnson, Kendle Early Stage, Lilly USA, Lundbeck ARS, Lundbeck USA, MedImmune, Medtronic, Merck and Co., Inc., Neurosearch, Next Wave Pharmaceuticals, Novartis, Noven, NovoNordisk, Orexigen, Otsuka, Parexel, Pfizer, PGX Health, PDPI, Pyydon, OED, Quintiles, Reckitt Benckiser, Roche, Sanofi-Aventis, Schering-Plough Corporation, SCOPe International, Sepracor, Inc., Sunovion, Shire, Siena Biotech, Supernus, Synposis Therapeutics, TakedaPharmaceutical Company, Theravance, Upsher-Smith, Valeant Pharmaceuticals, Vivus, Inc., World Wide Clinical Trials and Wyeth Research. Dr. Posner has received royalty payments from the electronic Columbia Suicide Severity Rating Scale (e-CSSRS). Ms. Lazzaretto reports no biomedical financial interests or potential conflicts of interest.

Pii: 0890-8567(12)00993-8

doi:10.1016/j.jaac.2012.12.007

© 2013 Published by Elsevier Inc., World Wide Clinical Trials and Wyeth Research. Dr. Posner has received royalty payments from the electronic Columbia Suicide

Remarkable -- the "disclosure" section is longer than the data section.

Serious challenge to the independence of research.

Multiple studies document impact of pharmaceutical associations on perception & interpretation.

Note: complete lack of documentation of AE/trauma in study.