Treatment of Attention Deficit/Hyperactivity Disorder among Children with Special Health Care Needs

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Objectives To describe the parent-reported prevalence of treatments for attention deficit/hyperactivity disorder (ADHD) among a national sample of children with special health care needs (CSHCN), and assess the alignment of ADHD treatment with current American Academy of Pediatrics guidelines.

Study design Parent-reported data from the 2009-2010 National Survey of Children with Special Health Care Needs allowed for weighted national and state-based prevalence estimates of medication, behavioral therapy, and dietary supplement use for ADHD treatment among CSHCN aged 4-17 years with current ADHD. National estimates were compared across demographic groups, ADHD severity, and comorbidities. Medication treatment by drug class was described.

Results Of CSHCN with current ADHD, 74.0% had received medication treatment in the past week, 44.0% had received behavioral therapy in the past year, and 10.2% used dietary supplements for ADHD in the past year. Overall, 87.3% had received past week medication treatment or past year behavioral therapy (both, 30.7%; neither, 12.7%). Among preschool-aged CSHCN with ADHD, 25.4% received medication treatment alone, 31.9% received behavioral therapy alone, 21.2% received both treatments, and 21.4% received neither treatment. Central nervous system stimulants were the most common medication class (84.8%) among CSHCN with ADHD, followed by the selective norepinephrine reuptake inhibitor atomoxetine (8.4%).

Conclusion These estimates provide a benchmark of clinical practice for the period directly preceding issuance of the American Academy of Pediatrics' 2011 ADHD guidelines. Most children with ADHD received medication treatment or behavioral therapy; just under one-third received both. Multimodal treatment was most common for CSHCN with severe ADHD and those with comorbidities. Approximately one-half of preschoolers received behavioral therapy, the recommended first-line treatment for this age group. *(J Pediatr 2015;166:1423-30)*.

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Attention deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder[1] commonly managed by pediatricians.[2] Professional guidelines describe best practices for diagnosis[1] and treatment.[3,4] The 2011 American Academy of Pediatrics (AAP) guidelines were expanded to include all children aged 4-18 years, with special considerations for preschoolers and adolescents. The AAP now recommends behavioral therapy first for preschool-aged children, with short-acting methylphenidate prescribed if therapy does not sufficiently improve symptoms. For older children, a Food and Drug Administration–approved ADHD medication with or without behavioral therapy is recommended.[3] Combination therapy (medication and behavioral therapy) is preferred, particularly for elementary-aged children.

In 2011, 6.4 million children aged 4-17 years (11%) had a parent report of an ADHD diagnosis by a health care provider.[5] Prevalence estimates of parent-reported ADHD increased by 33% from 1997 to 2008.[6] As ADHD diagnoses have increased, so has the prevalence of children taking medications for ADHD (ie, medicated ADHD).[2,7,8] Although there is earlier evidence of increased stimulant use among preschoolers with ADHD,[9] less is known about recent treatment patterns in very young children. Many children with ADHD

AAP	American Academy of Pediatrics
ADHD	Attention deficit/hyperactivity disorder
CNSS	Central nervous system stimulant
CSHCN	Children with special health care needs
NS-CSHCN	National Survey of Children with Special Health Care Needs
SNRI	Selective norepinephrine reuptake inhibitor

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not treated with medication receive behavioral or alternative therapies; however, little is known about the prevalence of these therapies. Epidemiologic research suggests that families of black and Hispanic children with ADHD are less likely to choose pharmacologic treatments and to regard behavioral treatments more positively[10,11]; however, population-based data on the relative frequency of nonpharmacologic ADHD treatment across racial and ethnic groups are needed to fully characterize ADHD treatment and identify any potential treatment gaps.[5]

The goals of this study were to: (1) describe the prevalence of medication, behavioral therapy, and dietary supplement use for ADHD among a national sample of children with special health care needs (CSHCN) with ADHD; (2) identify differences in prevalence by relevant demographic factors; and (3) assess the alignment of treatment patterns to the AAP's age group–specific guidelines.[3]

Methods

The 2009-2010 National Survey of Children with Special Health Care Needs (NS-CSHCN) is a nationally representative, population-based telephone survey conducted by the Centers for Disease Control and Prevention with funding and direction from the Health Resources Services Administration. Data were collected between July 2009 and March 2011.[12] Secondary analyses of these de-identified, existing survey data was considered exempt from Centers for Disease Control and Prevention institutional review board review. A knowledgeable parent or guardian in the household responded to a 5-part screen to determine whether any children aged 2-17 years in the household met the criteria of having a special health care need. A child was considered a CSHCN if he or she met one or more of the following criteria because of a medical, behavioral, or other health condition that had lasted or was expected to last 12 or more months: needs or uses medicine other than vitamins prescribed by a doctor; needs or uses more medical care, mental health, or educational services than is usual for most children of the same age; is limited or prevented in any way in his or her ability to do the things most children of the same age can do; needs or gets special therapy, such as physical, occupational, or speech therapy; or has any kind of emotional, developmental, or behavioral problem for which he or she needs treatment or counseling.[13]

Nationally, a total of 372 698 children were screened for a special health care need; of these, detailed interviews were completed for 40 242 CSHCN (1 selected at random per eligible household). The overall response rate was 25.5%, which incorporates a 43.7% response rate among those contacted by landline and a 15.2% response rate among those contacted by cell phone. The interview completion rate among eligible families was 81% overall, including 84% of landline households and 77% of cell phone families.

The survey included questions on family demographics, health care services, and presence of selected health conditions, including ADHD. Parents were asked whether their child had ever been diagnosed with ADHD by a doctor or other health care provider, and if so, whether the child currently had ADHD. For those with current ADHD, follow-up questions assessed parent-reported severity level (mild, moderate, or severe) and ADHD medication use during the past week and past year. Parents completing the survey in the last 5 of 6 quarters were also asked a series of more specific ADHD treatment questions. If medication was used in the past week, then the parent was asked to list medication(s) taken; because many respondents were at home during the telephone survey, they were asked to read the medication names directly from the medication bottles.

Medications were grouped into 6 categories: central nervous system stimulants (CNSSs), selective norepinephrine reuptake inhibitors (SNRIs), selective serotonin reuptake inhibitors, atypical antipsychotics, centrally acting alpha-agonist hypotensive agents, and centrally acting alpha-adrenergic receptor agonists (**Appendix**; available at www.jpeds.com). Parents were also asked whether their child had received behavioral treatment for attention deficit disorder or ADHD, including classroom management, peer interventions, social skills training, or cognitive-behavioral therapy in the past year, and whether their child had taken dietary supplements to treat ADHD in the past week or past year.

Weighted analyses using SAS-callable SUDAAN version 11.0.0 (RTI International, Durham, North Carolina) were conducted to produce estimates of current ADHD prevalence among CSHCN aged 4-17 years as well as the prevalence of ADHD medication use overall and by medication class, behavioral therapy, and dietary supplement use to treat ADHD among CSHCN at the national and state levels. National estimates of combination therapy (defined as past week medication treatment and past year behavioral therapy) were described as well. National treatment estimates were compared using the χ^2 test, stratified by child sex, child age, child race/ethnicity, US region of residence, health insurance status, presence of a medical home (a model of primary care that is patient-centered, comprehensive, team-based, coordinated, accessible, and focused on quality and safety),[14] parent perception of ADHD severity, and presence of current co-occurring mental or developmental conditions (referred to as co-occurring conditions). Co-occurring conditions included in this analysis were depression, anxiety problems, behavioral or conduct problems (eg, oppositional defiant disorder, conduct disorder), autism spectrum disorders, developmental delay, and intellectual disability. Multiple imputation was used by the National Center for Health Statistics to create values for respondents with missing data on household income (7.9% missing), parental education (0.9%), race/ethnicity (0.7%), and household language (0.5%); imputed values were incorporated into the analyses for these variables.[12]

Results

Among all completed NS-CSHCN interviews (n = 40 242), 9459 CSHCN aged 4-17 years had current ADHD, valid responses to the ADHD treatment questions, and complete data on sex. The demographic profile of the sample and this population is presented in **Table I** (available at www.