Stimulants and Atomoxetine Use and Expenditures in Children and Adolescents in the United States

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ABSTRACT

This study examined national level prevalence and expenditure patterns of stimulants and atomoxetine in children and adolescents in the United States. The 2003-2004 Medical Expenditure Panel Survey (MEPS) data were used to examine the utilization pattern of stimulants (amphetamine, dextroamphetamine, methylphenidate, and dexmethylphenidate) and atomoxetine in persons less than 20 years of age. Annual population, prescription, and expenditure estimates including 95% confidence intervals (CI) were derived after adjusting for the complex survey design of the MEPS. Prescription expenditures in the MEPS represent the amount paid to pharmacies from all sources, including payments by insurance and patients. The expenditures were adjusted to 2004 US dollar using the Consumer Price Index. In 2003-2004, an estimated 2.67 million (95% CI, 2.30 - 3.03 million) children and adolescents used stimulants or atomoxetine annually for an overall prevalence of 3.19% (95% CI, 2.78 - 3.60). Prevalence of stimulants alone was 2.78% (95% CI, 2.39-3.17%) with methylphenidates accounting for most of the usage. Children and adolescents using stimulants or atomoxetine were most often males (70%), whites (86%), and 10-14 years of age (52%). Nearly 90% of them reported an Attention Deficit Hyperactivity Disorder (ADHD) diagnosis. Annual expenditures for stimulants and atomoxetine were estimated at $1.69 billion (95% CI, $1.40 - 1.98 billion), with stimulants representing 79% of the expenditure. The average prescription cost was highest ($99.48) for atomoxetine and lowest ($75.70) for methylphenidates. Atomoxetine accounted for one-fourth of the prevalence and one-fifth of the expenditures in children. In conclusion, although stimulants accounted for most of the usage and expenditures, atomoxetine has emerged as the leading stimulant alternative in children. High prescription costs and utilization patterns for atomoxetine are likely to influence future prescription expenditure burdens in pediatric ADHD. More research is needed on the relative cost and effectiveness of various stimulant preparations and atomoxetine.

KEYWORDS: Stimulants; atomoxetine; prevalence; expenditure; children and adolescents.

Introduction

Attention-deficit hyperactivity disorder (ADHD) is a neurobehavioral developmental disorder in children and adolescents. It affects about 3–10% of children with symptoms starting before seven years of age. It is characterized by a persistent pattern of impulsiveness, inattention and hyperactivity. The main treatment options for ADHD include behavioral therapy or pharmacotherapy with stimulant medications or both.

The American Academy of Child and Adolescent Psychiatry recommends that the initial pharmacotherapy for ADHD should start with a drug approved by the Food and Drug Administration (FDA) for ADHD treatment (Pliszka et al., 2007). Stimulant medications have been approved by the FDA for ADHD treatment; these include dextroamphetamine, D- and D,L-methylphenidate, and mixed salts amphetamines. Atomoxetine was the first non-stimulant medication to be approved by the FDA for pediatric and adult ADHD (USFDA, 2003). Stimulants are considered to be the first line of treatment for ADHD, particularly when no comorbidity exists (Pliszka et al., 2007; Cheng et al., 2007).

However, atomoxetine, a selective norepinephrine reuptake inhibitor, is considered as a first choice in ADHD patients with substance abuse problems, tics, or anxiety. Atomoxetine is also considered as an alternative when stimulant treatment is associated with side effects or when there is a potential for abuse.

Previous epidemiological studies have focused on stimulants due to increased use of these agents in the 1990s and their potential for abuse in children (Zito et al., 2000; Olfson et al., 2003; Zuvekas et al., 2006). Studies have found that use of stimulants significantly increased from 0.6% in 1987 to 2.4% in 1996 in children. However, later trends suggest that the use of stimulants has remained relatively stable from 1997 to 2002 (Zuvekas et al., 2006).

A literature review revealed that little is known about the utilization of stimulants since the introduction...