ADHD: Then and Now

Symptoms of Attention Deficit/Hyperactivity Disorder (ADHD) have been documented in medical literature since the late 1700s[1], but were not serendipitously treated until 1937, when Benzedrine was observed to improve the behaviour and school performance of children with severe headaches[2]. In 1963, the first study on the effects of Ritalin (methylphenidate) on 'emotionally disturbed children' was published[3]; and in 1969 the first ADHD rating scales for children were developed[4]. In the 1970s, research on the effectiveness of stimulant medications in children with ADHD symptoms continued, but so did the criticism that school-aged children were being over-medicated unnecessarily. In 1975, several books were published to support the belief that ADHD isn't a real diagnosis, but was created by drug companies to make money, or that hyperactivity is caused by food allergies and additives.

There has been an exponential growth in ADHD articles in the literature between 1980 and 2005, with 5269 articles published on the epidemiology, diagnosis and treatment (2325 drug-related articles) of ADHD across the lifespan of the patient population[5]. The diagnosis of ADHD has been fine-tuned and refined periodically by panels of experts, especially in the adult population. In addition, many of the previous myths regarding the causes of ADHD have been proven to be incorrect. Neuroimaging studies have shown that subjects with ADHD have smaller, less active, less developed brain regions compared with controls[6]. Reduced brain volumes in the range of 3-10% have been observed in five brain regions, including the prefrontal cortex, and the smaller the regions the more severe the ADHD symptoms; particularly inhibition. A 2-3 year lag in brain development, and frequently a 4-5 year delay in emotional development, were observed in ADHD subjects. These developmental delays eventually catch up with the norm by early adulthood, but problems with inattention and impulse control often persist.

ADHD occurs in 7-8% of school-aged children and 4-5% of adults. It is found in all countries around the world with rates similar to or higher than those observed in North America. However, adult ADHD is only recognised and treated in 18 European countries. Predominately males are diagnosed with ADHD as children, but more females are being identified and diagnosed in adulthood. Symptoms of inattention, impulsivity and hyperactivity are well characterised in children with ADHD, but symptoms are different and more subtle in adulthood, which can often result in misdiagnosis.

Successful treatment of ADHD symptoms may result in only modest functional improvement in their daily lives due to the frequent occurrence of comorbidities. At least one comorbid condition is observed in 65% of children and 75% of adults with ADHD. In ADHD children, the comorbid conditions include oppositional defiant and conduct disorder, anxiety and mood disorders, tics or Tourette's disorder, and learning and pervasive developmental disorders. In ADHD adults, who have an average of three psychiatric comorbidities, including mood, anxiety, sleep, personality, and substance use disorders; gambling and other addictions are very common. In a study of 112 children with ADHD who were followed for 10 years, it was observed that stimulant treatment decreases the risk for subsequent comorbid psychiatric disorders and academic failure[7].

Pharmacotherapy, especially stimulant medications, remains the mainstay of treatment for ADHD. New formulations (isomers, immediate-release, and extended-release) and delivery systems (liquid, sprinkle, tablet, capsule, and patch) have made it possible to tailor the individual patient's treatment to the duration of efficacy required, and to help mitigate the potential for abuse, misuse and diversion. Several new non-stimulant medications to treat ADHD have emerged in the past few years, and though not as efficacious, provide a better safety profile and reduced concerns of abuse and addiction. Currently, several 'triple reuptake inhibitors', with varying affinities for dopamine, norepinephrine and serotonin receptors, are being developed to treat adult ADHD. In addition to treating symptoms of ADHD and having a low abuse potential, these new agents may potentially be effective on the comorbid mood disorders.

Remaining challenges continue to be the proper diagnosis and treatment of adults with ADHD. Though an increasing number of adults are being diagnosed with ADHD, an additional pool of adults has gone undiagnosed or is being ineffectively treated for alternative disorders. As with most chronic conditions, newly-diagnosed subjects fail to remain compliant with their prescribed medication for greater than two months. The average amount of time that an ADHD adult remains compliant with their initial ADHD therapy is 49.5 days[8]. Therefore, new long-acting, non-stimulant medications that are more tolerable and efficacious are needed for the long-term treatment of ADHD.

References

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Craig Earl, Ph.D. is Vice President of CNS Clinical Development at INC Research. He has more than 25 years of experience in the pharmaceutical industry, primarily in CNS clinical development. His clinical areas of expertise include protocol design (adult and pediatric, Phases I to IV), study conduct oversight, NDA submissions, regulatory agency responses, and key opinion leader and investigator interactions. His therapeutic areas of expertise include ADHD, psychiatry, pain, sleep disorders, and neurology.

Email: craig.earl@increseach.com