Motor Incoordination

In aSample of Preschool Children with Attention Deficit Hyperactivity Disorder

Thesis
submitted for partial fulfillment Of the Master Degree
in Neuropsychiatry

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مقدمة من

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Introduction

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Attention deficit hyperactivity disorder (ADHD) is a highly heritable neurodevelopmental disorder that affects 3% to 5% of all children. It is characterized by a childhood onset pattern of hyperactivity, inattention and impulsivity that commences in early childhood and often persists into adulthood ***(Barkley, 2009).***

The current psychiatric disease classification system, DSM-5, distinguishes three subtypes: a mainly inattentive, a mainly hyperactive–impulsive and a combined subtype ***(American Psychiatric Association, 2013).***

To meet diagnostic criteria for ADHD, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Editionrequires the individual to show at least six symptoms of either inattention (i.e. seems not to listen when spoken to, has difficulty organizing tasks) or hyperactivity (i.e. is often “on the go, talks excessively) which have persisted over a period of at least six months and cause clinically significant impairment in at least two settings (e.g. home and school). Further, these symptoms must have first presented before the age of 12***(American Psychiatric Association, 2013).***

ADHD is best seen as a multifactorial disorder in which genes and environment play a complicated intertwined role***(Barkley, 2009).***

ADHD is a clinically heterogeneous condition, in which symptom overlap or comorbidity with other conditions is the rule

rather than the exception.Patients with attention-deficit hyperactivity disorder (ADHD) often present with other mental health problems and may have more than one co-existing condition.ADHD and more likely to experience one or more psychiatric comorbidities by the age of 19 as motor coordination problems, tic disorders, sleep disorders, specific learning disorders such as dyslexia, and child-psychiatric disorders such as depression, anxiety, oppositional defiant and conduct disorders, and autistic spectrum disorders ***(Yoshimasu et al., 2012)***.

Children generally develop an amazing number of motor skills in the first years of their lives. Some of these skills, such as walking, develop naturally, whereas other skills, such as swimming and writing require a lot of practice after specific instruction. Not all children develop these skills to a level that can be expected for their age. For most of these children no medical cause and no specific neurological deficit can be found as a cause for their difficulties. These children are referred to as having Developmental Coordination Disorder (DCD***)(American Psychiatric Association, 2013).***

Some children suffer from mainly fine motor difficulties(poor handwriting, difficulties in using scissors or tying shoelaces),others are mainly disturbed in postural control (balance, problems in bicycle riding), or gross motor learning (playing football, learning to swim).Previously, these children have been labeled as suffering from (Clumsy Child Syndrome),(Non-cerebral-palsy motor-perception dysfunction), (Minor

NeurologicalDysfunction) or (Dyspraxia of childhood) ***(Magalhaes et al., 2006).***

The prevalence of Developmental Coordination Disorder has found to be 5-6% in school-aged children, boys being more frequently affected than girls (2:1 to 4:1) ***(Missiuna et al., 2008).***

Some authors consider DCD as the lowest extreme end of a continuum of motor performance, others describe DCD as a categorical disorder, or consider it as the lightest form of cerebral palsy.

Little is known about the etiology of DCD. It is probably best seen as a multifactorial disorder. In the following section genetic and environmental risk factors are discussed as well as some neurobiological and neurofunctional deviations associated with DCD***(Martin et al., 2006).***

Poor motor coordination or motor performance is frequent coexisting problem in children with ADHD, though it has received less attention in research. Recent clinical and experimental evidence suggests a greater role of motor factors in ADHD than was considered before. Many children with ADHD have weak pragmatic motor skills and these may be associated with working memory performance.***(Sergeant et al. 2006).***

Clinical and epidemiological studies report that 30%–50% of children with ADHD suffer from motor coordination problems. These percentages are dependent of the type of motor assessment, referral sources and the cut-off points used ***(Wilson 2005).*** In the

Scandinavian countries the combination of ADHD and motor coordination problems has led to a special term, Deficits of Attention and Motor Perception (DAMP). DAMP in its severe form occurs in 1.2–2.0% of all 7 year olds***(Gillberg and Kadesjo ,2003)***.

Children with (ADHD) and children with Developmental Coordination Disorder (DCD) appear to share difficulties in motor, academic, social, and emotional functioning**.** Children diagnosed with ADHD are frequently described as clumsy, having poor coordination, and suffering from poor fine and gross motor functioning ***(Schoemaker et al.,2005).***

Motor coordination problems are likely important factors mediating links between ADHD and poor physical activity outcomes.Children with ADHD tend to have more adipose tissue and poorer cardiovascular performance than controls ***(Harvey & Reid, 2003).***

Motor skill deficits in children and adolescents are also associated self-perceptions of with reduced physical and academic competence and with feelings of unhappiness with one's appearance ***(Piek et al.,2006).***

Motorperformance is an important predictor of a child's popularity(mostly children with ADHD) with his peers ***(Cummins et al., 2005).*** Children with DCD are not good at sports and outdoor play. They are at risk of becoming isolated as no one wants them on their team. They are known to have poor self-

esteem and are at risk of emotional problems such as anxiety and depression***(Hoza, 2007).***

Additionally, physical health concerns such aschildhood obesity and reduced physical fitness have been raised ***(Cairney etal., 2007)*** and motor coordination problems can interfere with academic performance ***(Piek et al., 2007).***

Motor coordination problems may also play a role in the increased risks for personal injury and adverse driving outcomes that are associated with the disorder. Children with ADHD are more than twice more likely than their non-ADHD peers to have sustained a severe injury requiring hospitalization and adults with the disorder are two to four times more likely than controls to have serious motor vehicle accidents.Thus, it is important to recognize these children, preferably at a young age ***(Missiuna et al., 2006).***

Aim of the Work

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1. To estimate the rate of occurance of motor incoordination in children with ADHD

2. To determine the type of motor incoordination in children with ADHD

3. To correlate between severity of ADHD symptoms and motor incoordination in children with ADHD.

Attention Deficit Hyperactivity Disorder

Attention Deficit Hyperactivity Disorder

Attention deficit hyperactivity disorder(ADHD) is a highly heritable neurodevelopmental disorder. It is one of the most prevalent psychiatric disorders in children and it greatly impairs social and cognitive functions in affected individuals. It is characterized by a childhood-onset pattern of hyperactivity, inattention and impulsivity, that commences in early childhood and often persists into adulthood***(Barkley, 2009)*** The current psychiatric disease classification system, DSM-5, distinguishes three subtypes: a mainly inattentive, a mainly hyperactive–impulsive and a combined subtype ***(American Psychiatric Association, 2013).***

In 1902, George Still, M.D., delivered a series of lectures in which he described the lack of moral control among children without noted physical impairments ***(Barkley,1998)***. Historically, a series of different names, including minimal brain damage syndrome, minimal brain dysfunction, hyperkinetic reaction of childhood, and attention deficit disorder have been used to describe the disorder now known as attention-deficit/hyperactivity disorder ***(American Psychiatric Association,1994).***

The earlier pathology-oriented nomenclature (e.g., minimal brain damage syndrome) reflected scientists' perception of the disorder's etiology. Early attempts to link attention deficits and behavioral disturbances to brain dysfunction were shaped by the experience of the encephalitis epidemic of 1917–1918***(Sandberg and Barton, 1996).***

Children who survived the infection experienced subsequent problems including hyperactivity, personality changes, and learning difficulties. However, despite many years of research attempting to identify specific etiologic correlates of the disorder, no single cause has been identified. ADHD is best understood as a group of behavioral symptoms that reflect excessive impulsivity, hyperactivity, or inattention. Since 1980, the term “attention” has been incorporated into the name of the disorder (e.g., attention deficit disorder with/without hyperactivity or attention-deficit/hyperactivity disorder). Whilecurrent diagnostic criteria do not require that attention difficulties or distractibility are central to the disorder, the nomenclature suggests otherwise***(Barkley, 2000)***.

Prevalence of ADHD:

ADHD is the most common psychiatric disorder of the childhood.Overall,prevalence ranges from 5-12% in school-aged children.Male to female ratio is around 3:1 in children and adolescents, but it is believed that females are under-diagnosed.Approximately 8-10% of males and 3-4% of females,under the age of 18 have ADHD***(Sadek,2014).***

The higher reported prevalence of ADHD in males may be due to social factors related to the identification and diagnosis of ADHD. Such factors include teacher bias towards males, as symptoms observed in the classroom setting are weighed heavily in the diagnosis of childhood ADHD***(Havey et al.,2005)***.

Sex differences in the prevalence of ADHD may also be accounted for the decreased lateralization of cognitive functions in females, which is thought to provide an advantage against some developmental disorders including ADHD ***(Holden,2005).*** ADHD's onset occurs around 3 years of age in both sexes ***(Neuman et al.,2005)***.

Roughly 80% of children with ADHD will continue into their adolescent years and 60% will maintain their core symptoms into adulthood***(Sadek,2014).***

However, ADHD symptoms usually lessen with age such that the rate of persistence is only 15% by age 25***(Faraone et al.,2006)***.

Comorbidities with ADHD

ADHD is a clinically heterogeneous condition, in which symptom overlap or comorbidity with other conditions is the rule rather than the exception.Patients with attention-deficit hyperactivity disorder (ADHD) often present with other mental health problems and may have more than one co-existing condition.ADHD and more likely to experience one or more psychiatric comorbidities by the age of 19 asmotor coordination problems, tic disorders, sleep disorders, specific learning disorders such as dyslexia, and child-psychiatric disorders such as depression, anxiety, oppositional defiant and conduct disorders, and autistic spectrum disorders ***(Yoshimasu et al., 2012)***.