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REVIEW ARTICLE

A Review on Therapeutic Stratagies of Attention-Deficit Hyperactivity Disorder (ADHD)

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ABSTRACT

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neuro developmental disorder characterized by difficulty paying attention, excessive activity, and impulsivity (acting before you think). ADHD is usually identified when children are in grade school but can be diagnosed at any time from preschool to adulthood. The provision of treatments and interventions for children, young people and their families who have ADHD is varied. Psychological therapies include psychoeducational input, behavioural therapy, cognitive behavioural therapy (CBT) in individual and group formats, interpersonal psychotherapy (IPT), family therapy, school-based interventions, social skills training and parent management training to encourage the development of coping strategies for managing the behavioural disturbance of ADHD. The most commonly used pharmacological drugs atomoxetine, dexamphetamine and methylphenidate are licensed for the management of ADHD in children and young people. Methylphenidate is a central nervous system (CNS) stimulant. Its action has been linked to inhibition of the dopamine transporter, with consequent increases in dopamine available for synaptic.

Keywords: Hyperactivity disorder, ADHD, Children, Psychotherapy, Dopamine

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CONTENTS

1. Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterized by difficulty paying attention, excessive activity, and impulsivity (acting before you think). ADHD is usually identified when children are in grade school but can be diagnosed at any time from preschool to adulthood. Recent studies indicate that almost 10 percent of children between the ages of 4 to 17 are reported by their parents as being diagnosed with ADHD. So in a classroom of 30 children, two to three children may have ADHD[1]. Short attention spans and high levels of activity are a normal part of childhood. For children with ADHD, these behaviors are excessive, inappropriate for their age, and interfere with daily functioning at home, school, and with peers. Some children with ADHD only have problems with attention; other children only have issues with hyperactivity and impulsivity; most children with ADHD have problems with all three. As they grow into adolescence and young adulthood, children with ADHD may become less hyperactive yet continue to have significant problems with distraction, disorganization, and poor impulse control[2].

ADHD can interfere with a child's ability to perform in school, do homework, follow rules, and develop and maintain peer relationships. When children become adolescents, ADHD can increase their risk of dropping out of school or having disciplinary problems. Adolescents with ADHD may also experience an increased risk of driving violations and accidents, are more likely to smoke cigarettes and abuse drugs, have problems with employment, and experience other mental health problems in addition to ADHD.

Early identification of ADHD is advisable to children are most often identified in elementary school. Effective behavioral and medication treatments are available to help manage the symptoms of ADHD. These treatments can improve functioning at home, school, and in social situations. Before treatment begins, each child should have a comprehensive assessment to make the diagnosis and plan for treatment[3].

2. Etiology

The diagnosis of ADHD does not imply a medical or neurological cause. Equally, the presence of psychosocial adversity or risk factors should not exclude the diagnosis of ADHD. The etiology of ADHD involves the interplay of multiple genetic and environmental factors. ADHD is viewed as a heterogeneous disorder with different sub-types resulting from different combinations of risk factors acting together[3,4].

Genetic Factors:

ADHD symptoms show quite strong genetic influences. Twin studies suggest that around 75% of the variation in ADHD symptoms in the population are because of genetic factors (heritability estimate of 0.7 to 0.8). The genetic influences appear to affect the distribution of ADHD symptoms across the whole population and not just in a clinically defined sub-group. No single gene of large effect has been identified in ADHD; rather several DNA variants of small effect each increasing the susceptibility of ADHD by a small amount have been associated[5].

Biological Factors:

A range of factors that adversely affect brain development during perinatal life and early childhood are associated with an increase in the risk of ADHD or attention deficit disorder without hyperactivity. These include maternal smoking, alcohol consumption and heroin during pregnancy, very low birth weight and fetal hypoxia, brain injury, exposure to toxins such as lead and deficiency of zinc. Risk factors do not act in isolation, but interact with one another. For example, the risk of ADHD associated with maternal alcohol consumption in pregnancy may be stronger in those children with a dopamine transporter (DAT) susceptibility gene[5]. Further research is required to confirm whether these act as direct risks for ADHD.There is increased risk of ADHD symptoms in epilepsy and of ADHD in genetic conditions such as neurofibromatosis type 1, and syndromes such as Angelman, Prader-Willi, Smith Magenis, velocardiofacial and fragile X. Secondary ADHD may follow traumatic brain injury[6].

Dietary Factors:

The influence of dietary factors in ADHD has attracted much public attention: food additives, sugar, colourings and 'E' numbers are often regarded as causes of ADHD, and elimination and supplementation diets are widely used, often without professional advice. Nevertheless, epidemiological research indicates a link between additives and preservatives in the diet and levels of hyperactivity, and at least a small proportion of children with ADHD demonstrate idiosyncratic reactions to some natural foods and/or artificial additives, and may be helped by a carefully applied exclusion diet[7]. Richardson reviewed the evidence on associations between ADHD and longchain polyunsaturated fatty acids (PUFA) and commented on the brain's need throughout life for adequate supplies, a relative lack of omega-3 PUFA, and a possibility that males may be more vulnerable because testosterone may impair PUFA synthesis. Scientific uncertainties remain, however, concerning the physiological significance of different measures of PUFA metabolism and they are not used in practice[8].

Psychosocial Factors:

ADHD has been associated with severe early psychosocial adversity, for instance, in children who have survived depriving institutional care. The mechanisms are not known but may include a failure to acquire cognitive and emotional control. Disrupted and discordant relationships are more common in the families of young people with ADHD. Discordant family relationships, however, may be as much a consequence of living with a child with ADHD as a risk for the disorder itself. In established ADHD, discordant relationships with a harsh parenting style are a risk factor for developing oppositional and conduct problems. Parental hostility and criticism can be reduced in children where ADHD symptoms have been successfully treated with stimulants[9]. Parents themselves may also have unrecognized and untreated ADHD, which may adversely affect their ability to manage a child with the disorder.

3. Signs and Symptoms

ADHD stands for Attention Deficit Hyperactivity Disorder. It is normally used to describe children who have three main kinds of problems:

- Overactive behaviour (hyperactivity)
- Impulsive behaviour
- Difficulty in paying attention

Because they are overactive and impulsive, children with ADHD often find it difficult to fit in at school. They may also have problems getting on with other children. These difficulties can continue as they grow up, particularly if children and families do not get the help they need. Some children have significant problems in concentration and attention, but are not necessarily overactive or impulsive. These children are sometimes described as having Attention Deficit Disorder (ADD) rather than ADHD[10]. ADD can easily be missed because the child is quiet and dreamy rather than disruptive. ADHD is not related to intelligence. Children with all levels of ability can have ADHD.

Overactive behaviour:

One mother described the first years of her son's life as follows: The day always began from the moment he was awake with his exhausting and insatiable demands. No one was prepared to babysit because he was so exhausting and a liability. It was impossible to enjoy him and no fun to take him anywhere. His energy levels were incredible. As parents we wondered where we were going wrong. If you have a child with less severe problems, overactive behaviour may only cause major difficulties when she or he goes to school. For example, a child who races around the classroom, unable to sit still, interfering with other children's activities, will probably not be very popular with other children, and may be seen as naughty or unwilling to learn[11].

Impulsive behaviour:

Being impulsive means acting without thinking about the consequences. Children with ADHD may be impulsive in many ways, such as saying or doing the first thing that occurs to them. They are also easily distracted by irrelevant things. These children find it very hard to carry out tasks which involvewaiting, since they have great difficulty stopping themselves from responding straightaway[12]. They will find it hard to do any activity which involves waiting to give an answer, or in which they have to take turns. Sometimes impulsive children find it easier to wait if they are given a reward for waiting, or some other kind of motivation. This does not mean that they have been deliberately impulsive. It just means that they find this kind of task particularly hard to handle and need extra encouragement to succeed.

Attention problems:

Children with ADHD have a short attention span. Theyfind it hard to concentrate and therefore hard to learn new skills, both academic and practical. Research from the USA suggests that 90% of children with ADHD underachieve at school and 20% have reading difficulties.For example, a mother of a child with ADHD described how Every parents' evening told stories of poor compliance, shoddy and incomplete work, class clowning, no homework, incessant talking and easy distraction both to himself and others.This explains why it is important to identify attention problems as soon as possible, preferably before children go to school, so that they can be given help. Children with ADHD may themselves be quite distressed, because they do not mean to behave badly in class but do not know how to change[13].

Social problems:

Children with severe ADHD may be rejected or disliked by other children, because they disrupt their play or damage their possessions. It is easy for a child with ADHD to become labelled as troublesome, or for parents to think it is their fault for not controlling their child.Part of the difficulty is that children with ADHD may not realize how their behaviour affects other people. They may want to make friends, but have no idea how to go about it, having never picked up the basic rules of social behaviour which most children learn naturally. Because the children are impulsive, it is also easy for other children to 'set them up' to behave badly[14].

4. Diagnosis

Some parents see signs of inattention, hyperactivity, and impulsivity in their toddler long before the child enters school. The child may lose interest in playing a game, watching a TV show, or may run around completely out of control. But because children mature at different rates and are very different in personality, temperament, and energy levels, it's useful to get an expert's opinion of whether thebehavior is appropriate for the child's age. Parents can ask their child's pediatrician, or a child psychologist or psychiatrist, to assess whether their toddler has an attention deficit hyperactivity disorder or is, more likely at this age, just immature or unusually exuberant. ADHD may be suspected by a parent or caretaker or may go unnoticed until the child runs into problems at school. Given that ADHD tends to affect functioning most strongly in school, sometimes the teacher is the first to recognize that a child is hyperactive or inattentive and may point it out to the parents and/or consult with the school psychologist. Because teachers work with many children, they come to know how "average" children behave in learning situations that require attention and self-control. However, teachers sometimes fail to notice the needs of children who may be more inattentive and passive yet who are quiet and cooperative, such as those with the predominantly inattentive form of ADHD.

Ideally, the diagnosis should be made by a professional in your area with training in ADHD or in the diagnosis of mental disorders. Child psychiatrists and psychologists, developmental/behavioral pediatricians, or behavioral neurologists are those most often trained in differential diagnosis. Clinical social workers may also have such training[14,15].

5. Treatment

Although there is no cure for ADHD, currently available treatments may help reduce symptoms and improve functioning. ADHD is commonly treated with medication, education or training, therapy, or a combination of treatments.

Recognition and treatment strategies:

The provision of treatments and interventions for children, young people and their families who have ADHD is varied. The ability to recognise and diagnose the disorder and the way in which services are provided and organised for this identified group are inconsistent as services move towards providing comprehensive child and adolescent mental health services (CAMHS). The identification of affected people is unsystematic and driven largely by the extent to whichparents are knowledgeable about the condition or recognise that their child might have hyperactive behaviour. Historically, services for affected children and young people have mostly been provided by CAMHS, psychiatrists with a specialism in learning disability, or paediatricians based in child development centres or in community child health departments. The willingness of children, young people and their families to seek help has sometimes been compromised by stigma associated with mental health services. Referral pathways can be complicated, and are subject to considerable variation in the local organisation of mental health services for children and young people. There can be difficulties with awareness and recognition of the symptoms by healthcare professionals in schools, primary and secondary care and by the other professionals who come into contact with this group. Treatments and interventions for ADHD are varied and provided in a variety of settings, usually including specialist CAMHS or paediatric clinics[15].

Psychological therapies, parent training and other support:

Psychological therapies include psychoeducational input, behavioural therapy, cognitive behavioural therapy (CBT) in individual and group formats, interpersonal psychotherapy (IPT), family therapy, school-based interventions, social skills training and parent management training to encourage the development of coping strategies for managing the behavioural disturbance of ADHD[16]. Advice is sometimes given to schools and residential institutions. Remedial disciplines such as occupational therapy and speech and language therapy are sometimes involved in helping the development of individual children. Families of children and young people who have ADHD may require social support for example, child care relief, help in the home and family support workers.

Dietary measures:

Dietary supplements or restrictions are not commonly provided by health services as interventions for ADHD, but they are nevertheless used by many families, sometimes with advice from voluntary or private sectors. Paediatric dietitians are occasionally involved, especially when potentially hazardous regimes, such as exclusion diets, are contemplated.

Medication:

For many people, ADHD medications reduce hyperactivity and impulsivity and improve their ability to focus, work, and learn. The first line of treatment for ADHD is stimulants.

Stimulants: Although it may seem unusual to treat ADHD with a medication that is considered a stimulant, it is effective. Many researchers think that stimulants are effective because the medication increases the brain chemical dopamine, which plays essential roles in thinking and attention.Methylphenidate is a central nervous system (CNS) stimulant. Its action has been linked to inhibition of the dopamine transporter, with consequent increases in dopamine available for synaptic transmission. It is a Schedule 2 controlled drug and is currently licensed for use in children over 6 years old. Both immediate-release (IR) and modified-release (MR) formulations are available in the UK. Common adverse effects include insomnia, nervousness, headache, decreased appetite, abdominal pain and other gastrointestinal symptoms, cardiovascular effects such as tachycardia, palpitations and minor increases in blood pressure. Growth can be affected, at least in the short term, so height and weight are monitored regularly and plotted on growth charts[17].

Dexamphetamine is a sympathomimetic amine with a central stimulant and anorectic activity and is licensed as an adjunct in the management of refractory hyperkinetic states in children from 3 years old. Dexamphetamine is also a Schedule 2 controlled drug. The common adverse effects are similar to those of methylphenidate. Dexamphetamine is unlikely to be used as a firstline treatment for the majority of children or young people with ADHD because of a greater potential for diversion and misuse than the other medications.

Non-Stimulants: These medications take longer to start working than stimulants, but can also improve focus, attention, and impulsivity in a person with ADHD. Doctors may prescribe a non-stimulant if a person had bothersome side effects from stimulants, if a stimulant was not effective, or in combination with a stimulant to increase effectiveness. Two examples of non-stimulant medications include atomoxetine and guanfacine[18].

Atomoxetine is a selective noradrenaline reuptake inhibitor. It is licensed for the treatment of ADHD in children 6 years and older and in young people. Common adverse effects are abdominal pain, decreased appetite, nausea and vomiting, early morning awakening, irritability and mood swings. Increased heart rate and small increases in blood pressure have been observed in clinical trials. Cases of hepatic disorders associated with atomoxetine have been reported, and patients and parents should be advised of the risk and how to recognize the symptoms of hepatic disorders. Furthermore, reports of suicidal ideation in a small number of affected children have led to recommendations that clinicians and parents should be alerted to a possible risk of self-harm.

Antidepressants: Although antidepressants are not approved by the U.S. Food and Drug Administration (FDA) specifically for the treatment of ADHD, antidepressants are sometimes used to treat adults with ADHD. Older antidepressants, called tricyclic's, sometimes are used because they, like stimulants, affect the brain chemicals norepinephrine and dopamine. There are many different types and brands of these medications all with potential benefits and side effects.Sometimes several different medications or dosages must be tried before finding the one that works for a particular person. Anyone taking medications must be monitored closely and carefully by

their prescribing doctor. Call your doctor right away if you have any problems with your medicine or if you are worried that it might be doing more harm than good. Your doctor may be able to adjust the dose or change your prescription to a different one that may work better for you.

Other medications, including atypical antipsychotics, bupropion, nicotine, clonidine, modafinil, tricyclic and other antidepressants are occasionally prescribed offlabel to patients who do not respond to licensed medications. Medications should only be initiated by an appropriately qualified healthcare professional with expertise in ADHD after a comprehensive assessment. Continued prescribing and monitoring of medications may be performed by GPs, under shared care arrangements.

Treatment strategies for adults

The treatment strategies for adults with ADHD are essentially similar to those used in childhood. There are, however, some key differences that need to be taken into account. Identification has been uncommon in the UK, and there are currently very few specialist services in the NHS and only a few that offer diagnostic or treatment services within generic AMHS. Psychological treatment is not routinely offered to adults with ADHD and there have been few attempts to quantify the benefits of such interventions. Adults with ADHD are currently seen in a few specialist clinics and include both transitional cases diagnosed in childhood as well as adults who were not diagnosed during childhood. In many cases adults with ADHD have been diagnosed and treated for coexisting symptoms and syndromes. Because of the increased rates of ADHD among close family members, many have children with ADHD, and need additional help to provide effective support for their children[19].

Medication:

While the number of drug trials in adults is far smaller than in children, they consistently demonstrate the effectiveness of stimulants to reduce the level of ADHD symptoms in adults fulfilling diagnostic criteria for ADHD. Treatment regimes in adults are similar to those used in children, although in a few cases higher doses are used. Although stimulants are the most studied and most effective treatment for ADHD in children and adults, their use in adults remains controversial across Europe. In the UK, treatment of ADHD in children has dramatically changed in the last decade with a marked increase in the diagnosis of ADHD and a doubling of stimulant prescriptions between 1998 and 2004. However, this change in perspective is only slowly filtering through to those engaged in treating the adult population. It remains an anomaly that many drugs that are considered to be safe and effective in children and young people are not licensed for use in adults.

Stimulants are usually the first-choice pharmacological treatment for ADHD in both children and adults. In the UK, both methylphenidate and dexamphetamine are available, although as yet remain unlicensed for use in adults. There is some evidenceregarding the safety and effectiveness of stimulants in children, and an increasing amount of evidence for efficacy in adults.The second-line choice of medication for ADHD in adults is usually atomoxetine. Third-line choices include bupropion, modafinil and antidepressants with noradrenergic effects such as imipramine, venlafaxine and reboxetine, although there is less consistent evidence for these medications in the reduction of ADHD symptoms in adults.

Psychological treatments:

Psychotherapeutic interventions that have been used to treat adults with ADHD include psychoeducation, use of support groups, skills training, CBT, coaching and counseling. Psychological interventions applying a cognitive paradigm to teach strategies to manage ADHD have been used in adults with ADHD, usually as a complementary treatment to the use of stimulant medication, although they may be sufficient for adults where considerable moderation of symptoms has occurred with age. Qualitative research has suggested that psychological support begins at the time of diagnosis, following which adults with ADHD go through a process of adjustment in coming to terms with their diagnosis and the impact of the disorder on their lives. Psychological treatment can then shift to focus on the treatment of coexisting psychiatric problems, psychological problems and skills deficits. The aim is to help people develop methods to give structure to daily living and to improve interpersonal skills so they may function more successfully and achieve their potential. Indeed there is a strong evidence base for psychological treatment of many psychiatric problems that are associated with ADHD.

6. Conclusion

ADHD is a one of the most common disorder in children's and adults. ADHD is a psychological disorder, genetic factors, environmental factors, biological factors and social factors influencing the causes of ADHD. It was commonly observed in below six year children's and adults. ADHD patients showing overactive and impulsive behaviour of all kind of situations.The present review concluded all the information about the current state of the art of diagnosing and treating children younger than 5 years who have the ADHD, the intent of this special issue is to provide the reader with the most comprehensive and current information to date on this topic.

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