

Assessment and treatment of Attention Deficit Hyperactivity Disorder

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Sri Lanka Journal of Child Health, 2007; **36**: 135-7

(Key words: assessment, treatment, attention deficit hyperactivity disorder)

Introduction

Attention deficit hyperactivity disorder (ADHD) is a commonly diagnosed behavioural disorder in children with a chronic course. ADHD manifests as hyperactivity, inattention and impulsiveness, which are its main diagnostic criteria¹. Most apparent features are hyperactivity in school, home and elsewhere, difficulty in sustaining attention to schoolwork and other activities that demand concentration, disruptive behaviour and accident proneness by acting without thinking of consequences. The condition predominantly affects boys. Girls with may be missed as they present more often with only inattention². The aetiology is thought to be genetic in 75% of cases. Antenatal risk factors, obstetric complications may play a role in its development in others and family conflict may worsen the problem. Early detection and treatment is important to avoid serious functional impairments such as academic underachievement, poor employment prospects and risk taking behaviour in adolescence and adulthood, which are well recognised in longitudinal studies³. Multiple structural, neurochemical and functional disruptions in the brain contribute to pathophysiology of condition.

Assessment

Diagnosis of ADHD requires thorough evaluation using diagnostic criteria and guidelines are available for paediatricians for use in community setting². Unfamiliarity may lead to diagnosis on insufficient grounds. In addition to a clinical assessment, standardized scales designed for ADHD should ideally be used as far as possible to gather information from parents and teachers. ADHD often coexists with other conditions such as depression, anxiety, bipolar disorder, oppositional defiant disorder, and tic disorders and comprehensive evaluation for these conditions should also be performed². Children may also have coexisting learning disabilities, although it may be difficult to distinguish these from the symptoms of ADHD.

Pharmacotherapy

Cerebral stimulants remain the preferred treatment for ADHD and are recommended for children over the age of 6 years. Several preparations of these drugs are currently in use and found to be effective and relatively safe.

Cerebral stimulants

Methylphenidate (MPH) is a first line treatment of ADHD and the most widely used preparation. The only stimulant available in Sri Lanka is the immediate release MPH tablets. Despite a low bioavailability of 20-25% and a half life of 3 hours, MPH has demonstrated a large effect size⁴. A starting dose of 5 mg two to three times a day is recommended, which can be built up to a total dose of 0.7mg/kg/day. If no effective response is seen, the dose can be titrated to a maximum dose of 2mg/Kg/day⁵. MPH is effective in reducing all the core symptoms of ADHD, but improvement in hyperactivity and impulsiveness is better than inattention. Compliance could be affected due to side effects such as anorexia, insomnia and nervousness and from having to take multiple doses. Poor appetite can be alleviated by giving the medication after an adequate meal. The effect of MPH on growth is minimal and of relatively minor clinical concern⁶. Insomnia is another common side effect, which may be prevented by administering the last dose for the day not later than 4 or 5 pm. A recent study reported a statistically significant increase in diastolic blood pressure and heart rate in children taking stimulant medication but question remains in quantifying risk versus benefit⁷. Close monitoring of blood pressure and heart rate is essential, especially in patients with cardiovascular risk factors. Headache and abdominal pain are common complaints at the beginning of treatment but are usually transient. When using MPH in children with epilepsy, caution is required as the seizure threshold can be reduced. MPH is best avoided in children with exfoliating skin disease as it may worsen the condition. As MPH is related to amphetamine group of drugs, the potential for abuse especially in adolescents has been considered. However, a meta-analysis has shown that treatment with

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stimulants is associated with a decreased risk for subsequent substance abuse problems⁸.

MPH is also available as modified release preparations given as a single daily dose and is now available as a skin patch as well. Another first line drug widely used for ADHD is dexamphetamine⁹. Atomoxetine is a relatively new drug and a non-stimulant that is increasingly favoured in the treatment of children with ADHD who are intolerant to MPH due to anorexia, sleep disturbance or anxiety. None of these treatment options are available in Sri Lanka.

Non-stimulant medication

The tri-cyclic antidepressant imipramine, once the most commonly used alternative to stimulants, has lost favour because of its anticholinergic side effects such as dry mouth and constipation. Treatment with imipramine and related drugs may be recommended following partial response or no response with stimulants. Children treated with imipramine need baseline and periodic electrocardiogram (ECG) monitoring to assess safety of treatment⁹. Bupropion, which has only shown modest efficacy in ADHD trials, is considered a better option in adolescents who also smoke tobacco or have underlying mood disorder, or in those who abuse drugs. Patients with seizure history should not use bupropion as it may induce seizures⁴. Another medication used in the treatment of ADHD is the alpha agonist clonidine. The selective serotonin reuptake inhibitors such as fluoxetine and atypical antipsychotics such as risperidone have also been used but there is less evidence to support their benefit in monotherapy of ADHD.

ADHD and Comorbid disorders

Comorbidity is the rule rather than the exception and 60-65% of children with ADHD have other concurrent disorders. This makes ADHD a complex problem that is difficult to treat with a potential for treatment failure in some cases and dissatisfaction in parents regarding the outcome. When associated depression and/or anxiety are present, fluoxetine is a useful addition to MPH. In comorbid tic disorder or Tourette disorder, risperidone, haloperidol, pimozide or clonidine are options for treatment along with MPH⁹. In the presence of significant aggressive or disruptive behaviour, addition of risperidone, sodium valproate or lithium is effective^{9,10}.

Non-pharmacological intervention

Evidence shows that combined behavioural intervention and pharmacological treatment to be the most effective in eliminating core symptoms of ADHD as well as improving the family and

social functioning of the child and reducing disruptive behaviour in school¹¹. Behaviour therapy alone does not give the same benefit. Children with ADHD also need intensive structured guidance with school work to prevent academic failure and loss of motivation. In an outpatient sample of ADHD children on long term treatment with MPH, the most persistent problem complained by parents was underachievement in school¹². Parents need education about ADHD to help them understand and respond appropriately to the behaviour of the child and have realistic expectations about the outcome of treatment.

There are many popular beliefs and misconceptions about the cause of ADHD. As a result, various alternative treatments are claimed to be effective and publicity given on mass media and the internet. Such treatments advocate elimination of sugars and artificial colours, flavours and preservatives from the child's diet or inclusion of Omega 3 fatty acids, mega doses of vitamins and mineral supplements. There is no reliable evidence in research to support their effectiveness in the treatment of ADHD¹³.

Summary

The diagnosis of ADHD should be made using stringent criteria. Overenthusiastic labelling of all children with hyperactivity as ADHD should be avoided. Early identification and treatment is important to prevent serious harm to quality of life. MPH is effective and safe but careful monitoring of cardiovascular effects, and growth is essential. Comorbid disorders are common in ADHD and multiple drugs may be required to achieve satisfactory outcome of treatment.

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