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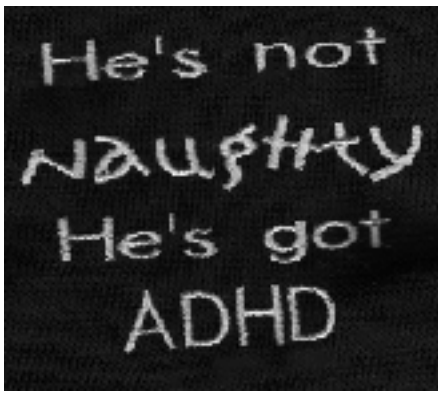
Case Study 1: Arhaan is a difficult to manage child. According to his mother, he rarely sits at a place, even to eat his favourite Mac D burger. It is difficult to get him to finish any task or play activity. During most of the social visits, he is unmanageable and creates embarrassing situations. His mother has started declining any invitations recently and also started punishing him for his bad behavior but the problem only seems to increase. At home he is stubborn and refuses to follow instructions.

Case Study 2: Sumit has been struggling with his studies since his primary school level. Now in 8th standard, he has lost interest in studies and hardly ever sits down to study at home. Most of his teachers complain that he doesn't concentrate on his studies. He otherwise seems intelligent and answers in the classroom.

In both of these above case scenarios, the diagnosis of ADHD seems pretty straight forward but it is important to evaluate the other difficulties and co-morbid conditions the child seems to face. Hyperactivity or Attention Deficit Hyperactivity Disorder (ADHD) though, a common disorder is surrounded by common misconceptions.

Myth # 1 ADHD is bad behavior and poor parenting!



ADHD is a Neurobehavioral condition and has very well established Neurochemical & Neuroanatomical basis. Neuroimaging studies conducted in adults with ADHD have shown alterations in the brain at the structural and functional levels, and also in terms of connectivity. These findings have been observed mainly in the inferior frontal and dorsolateral prefrontal cortex, as well as in striatal, anterior cingulate, parietotemporal and cerebellar regions. There are PET studies that show that the utilization of glucose in the prefrontal cortex, is diminished in ADHD. Dysfunction of fronto-striatal dopaminergic and noradrenergic circuits with resultant executive deficits in cognitive functioning are demonstrated in various studies and essentially forms the basis of Pharmacotherapy in ADHD.

Myth # 2 ADHD is over-diagnosed in western countries

ADHD is seen in 7-8% of school going children and about 60-80% of these children may continue to have features of ADHD even in adolescence and early adulthood as per American Academy of Pediatrics. Indian studies also show similar prevalence of ADHD in school going children.

Myth # 3 All children with ADHD have to be hyperactive.

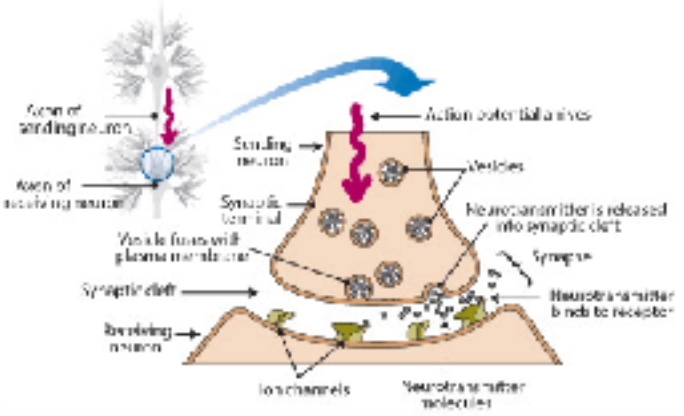
The children may be predominantly inattentive, predominantly hyperactive- impulsive or combination of these 3 symptoms clusters. However the children who are Hyperactive - Impulsive or Combined type get picked up early. These children have trouble sitting at one place and are constantly in motion. They have difficulty in completing any tasks and are restless even while sitting. They tend to be impatient and would constantly interrupt others. Inattentive ones get easily distracted, appear lost and are often forgetful. In fact the commonest presentation is Combined type (50-60%) where the symptoms of Inattention, Hyperactivity and Impulsivity are present followed by Inattentive type (30-40%) and the least common one is Hyperactive-Impulsive type (10%). Diagnostic criteria for ADHD is DSM - V which helps to understand these kids to a greater extent.

Myth # 4 Medications for ADHD have many side effects and hence need to be avoided.

Most of these children with ADHD require help or medication during the initial years but usually settle by early adulthood. Medications are safe, effective and are easily available but require proper evaluation and prescription. Diet modification in the form of reduction in sugars, chocolates, junk food help but have very limited role to play. Regular Physical activity and exercise is a must for these children and helps them in initial years. However medications remain the mainstay for the management of ADHD.

Myth # 5 Drugs do not regulate the symptoms in ADHD.

The commonest and the oldest drug used in the management of ADHD has been Methylphenidate which is a CNS stimulant. Research suggests that Methylphenidate(MP) works by increasing the level of extracellular dopamine (DA) in the brain. MP blockades DA transporters (DATs) as well as norepinephrine transporters. Dysfunction of the dopaminergic as well as the noradrenergic systems, which have self-regulatory functions such as mediating selective attention (noradrenergic neurons) and motivation (dopaminergic neurons), are



implicated in the pathogenesis of ADHD. Another newer drug used for ADHD is Atomoxetine. Atomoxetine HCl is a selective norepinephrine reuptake inhibitor. These medications are available in short-acting and long-acting forms. The short-acting forms last about 4 hours, while the long-acting preparations last between 6 to 12 hours.

Myth # 6 These drugs are addictive and may cause severe side effects to my child.

These medications may have mild side effects like Decreased appetite, Insomnia, Increased anxiety, Irritability and Mild stomach aches or headaches in some children. Most of these side effects settle within 2 to 3 weeks of initiation of the medications. The dosage are gradually titrated to minimize the side effects. It is important to understand that though these medications are CNS stimulants, that are not habit forming and children need to be give proper drug holidays during the treatment period.

Myth # 7 There is no role of rehabilitative therapist.

ADHD is best managed by a team of therapist along with the medical professional as the team leader. Occupational therapy with sensory integration technique is quite effective in reducing symptoms in younger children. Behavior modification can be taught to the parents for management of disruptive behaviours. There is increasing awareness among parents and schools about ADHD. It is important that we advise the parents to share their concerns with the school counsellor and discuss classroom modifications and support at school. Since most of the children may have academic problems, they may require detailed assessments and remedial education in the primary or middle school. As these children require long term support, regular follow up and timely intervention helps these children to achieve their full potential.

Myth # 8 Children with ADHD will grow out of it eventually.

The natural progression of ADHD does indicate decrease in the symptoms of hyperactivity in mid teens, but inattention may persist during adolescence or early adulthood. Long term follow-up studies indicate that a substantial portion of children with ADHD experience academic difficulties, learning disabilities, slow learner and as many as 40% may develop antisocial personality disorder, substance abuse or criminality during adolescence and adulthood. Older children & Adolescents with ADHD are also prone to depression, anxiety, and have suicidal tendencies too. Also ADHD is known to be associated with numerous comorbidities. With regard to the primary symptomatology, long-term outcomes of ADHD include complete remittance of symptomatology, residual ADHD symptoms, or persistence of the full syndrome.

TAKE HOME MESSAGES

1. For Clinical diagnosis of ADHD it is important to note that the symptoms are **Extreme in severity** present **Most of the time** seen in **All situations** usually **Disruptive** would **Affects studies and play** and the children have **Less sleep**.
2. It is important to note that many Disorders Commonly Accompany ADHD such as Oppositional defiant disorder, Conduct disorder, Learning and language disabilities , Anxiety disorders, Depressive disorders, Bipolar disorder and Tourette's Disorder.
3. Aim of Management is limiting **disruptive behaviours** and **maximising functionality** which in the case of kids is related to academics, cooperative play and learning new skills.
4. **Behavior modification techniques** with parental counselling help in Long term behavior changes and should be emphasised with or without medications.
5. Defiant behaviors and tantrums could be present in children and need counselling along with other therapies like occupational therapy, special education.