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Case Report

Attention deficit in children: a multiprofessional approach

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ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is the most common behavior disorder in children characterized by attention deficit, overactivity and impulsivity, which may persist into adolescence and adulthood. It is often complicated with multiple comorbid disorders which when undiagnosed or untreated significantly affects the children on aspects like academic skills, peer relationship, social life and difficulty in leading productive lives. This report presents a case of 12 year old male child with attention deficit and poor academic performance, diagnosed and treated for ADHD with a complex array of coexisting disorders untreated. An attempt is made to highlight the differential diagnosis for attention deficit in children, comorbid disorders, and the necessity for a multiprofessional approach in complete evaluation and comprehensive management of the same.

Keywords: ADHD, Differential diagnosis, Comorbidity, Comprehensive management

INTRODUCTION

Children identified as poor listeners, difficult to manage, with detoreating academic performances are the commonest group referred by teachers at school for evaluation to health care professional. ADHD is the commonest diagnosis suggested by a pediatrician at the first visit. The mimicking features of hearing loss, auditory processing disorder and many other coexisting disorders are being left undiagnosed and untreated many a times.

CASE REPORT

A 12 year old boy presented to the ENT outpatient-department with the complaint of headache for about 2 years. He was referred to rule out ENT related causes of headache. A detailed history was obtained which reveals, the chronic headache was bitemporal, dullaching, intermittent in nature, not associated with nausea, vomiting, visual disturbances and neck stiffness. He was suffering from chronic insomnia-sleeping for four hours at night with day time restlessness, irritability, loses temper easily, mood fluctuations and abnormal body movements. He was identified as a poor listener with detoreating academic performance at school. He was born to non-consanguineous parents with nil family history of neurological or psychiatric disorders. At birth he presented with small lumbosacral syringomyelia for which he was operated at 2 years of age. There was a mild delay in attaining mental and motor milestones. At 5 years of age, he was diagnosed of having ADHD and treated for 8 months following which he had a good improvement in academics and behavior. At 7 years of age he had bilateral traumatic knee joint dislocation for which he underwent bilateral knee joint surgery. He had recurrent right shoulder dislocation before 1 year for which he was treated. He was subjected to complete examination with nil significant clinical findings in ENT. Audiological evaluation reveals bilateral mild sensory neural hearing loss with 95% speech discrimination score. A multi professional evaluation obtained the final diagnosis as ADHD/bilateral mild sensory neural hearing loss/ oppositional defiant disorder/bipolar mood disorder/learning disorder (especially in mathematics)/overflow motor movements/joint laxity. A

multiprofessional approach is adopted in its integrative management with satisfactory improvement.

DISCUSSION

A child who is inattentive, hyperactive with poor academic performance is difficult to manage both at school and at home. With increasing awareness of parents and teachers, the referral rate of such children to a health care professional is increasing in the current era. Chances of underdiagnosing and undertreating children with attention deficit is possible due to many overlapping and coexisting features of ADHD with childhood hearing loss, auditory processing disorder, learning disorder, autism, personality disorder, generalized anxiety disorder, bipolar mood disorder, obsessive compulsive disorder, oppositional defiant disorder, conduct disorder, psychotic disorder, and low IQ.[1] A multiprofessional team approach is therefore necessary for complete evaluation and comprehensive management.

ADHD is a neurodevelopmental psychiatric disorder manifesting with significant inattention, hyperactivity and impulsive behavior which is inappropriate to the corresponding age persisting for atleast 6 months as per DSM-IV-TR criteria (Diagnostic and Statistical Manual of Mental Disorders). It has a prevalence rate of 5-10% in 2-17 years of age group children and boys are more commonly affected than girls.[2]

Undiagnosed childhood hearing loss can also present with hyperactivity, impulsivity, inattention due to difficulty in hearing instructions or understanding what is expected from the child. Hearing impairment may itself lead to delayed language acquisition which in turn leads to poor academic performances. Children with mild Sensory Neural Hearing Loss (SNHL) were reported to have significant dysfunction on aspects like social behavior, communication, academic performance and self-esteem.[3] Children with acquired sensory neural hearing loss appears to be at increased risk for attention problems.[4,5] The coexistence of hearing loss with ADHD makes it still more difficult for accurate timely diagnosis and management.

Central Auditory Processing Disorder (CAPD) is characterized by difficulty in processing sounds in the brain without any hearing loss. The overlapping features of ADHD and CAPD are inattention, unfocussed nature, easy distractibility, poor academic skills, unable to follow instructions and perform tasks.[6] A child with CAPD has difficulty in concentrating in noisy environment, sound discrimination problems, poor auditory memory and language processing problems.[7] The coexistence of CAPD with ADHD severely compromises the child's ability to listen, remember and perform tasks.[8]

Specific Learning Disorder (LD) is diagnosed when a child's achievement on individually administered standardized testing in reading, writing or mathematics is substantially below that expected for age, schooling and level of intelligence (DSM-IV-TR). LD was reported in 70% of the children with ADHD. Children with LD and ADHD, seems to have more severe attention problems than either of the two presenting alone.[9]

Studies have reported that 50% of Autism Spectrum Disorders (ASD) population meets the diagnostic criteria for ADHD. ASD coexisting with ADHD leads to significant deficits in social behavior, adaptive functioning and executive control.[10]

A variety of psychiatric disorders are reported to be comorbid with ADHD, which includes Oppositional defiant disorder, conduct disorder, Bipolar mood disorder, anxiety disorder, depression.[11] Transient or persistent sleep disorders are also common in ADHD.[12]

ADHD with comorbid tic disorders show disruptive behavior and high functional impairment.[13] Motor overflow movements are reported in some children with ADHD due to white matter abnormalities in motor and premotor circuits, which are important for motor response inhibition.[14] Higher frequency of epileptiform discharges in EEG is reported in children with overactivity, behavioral problems and SNHL.[15,16] The prevalence of joint laxity is found to be higher in children with ADHD, gives a new basis for further studies.[17]

Such a complex array of comorbid conditions associated with ADHD can be explained by genetic, environmental, structural and functional changes in the nervous system in causing ADHD.

Genetic alterations related to dopaminergic, noradrenergic and serotonergic neurotransmission systems were reported to have a role in causing ADHD.[18] 16p11.2 chromosomal rearrangements are found to have a significant role in the pathogenesis of syringomyelia and, it's association with ADHD, developmental delay, cognitive impairment, ASD, seizure disorders were reported.[19] A significant decrease in the volume of white matter and brain structures, with focal cortical thinning in prefrontal cortex, and altered functional connectivity is seen in ADHD patients.[20] Maternal illness, very low birth weight, preterm birth, intrapartam complications, neonatal illness lead to a wide spectrum of neurodevelopmental disorders like cerebral palsy, mental retardation, ADHD, learning disorder, language disorder, hearing and visual impairment.[21]

Adult ADHD persist in 10-60% of children diagnosed with childhood ADHD.[22] A higher risk of degenerative neural disorders, in particular dementia with Lewy bodies is noted to be present in patients with proceeding adult ADHD.[23]

Such a wide spectrum of neurodevelopmental, psychiatric, and other comorbid disorders presenting in attention deficit children requires a multiprofessional

approach in timely accurate diagnosis and comprehensive management.[24,25] This includes:

1. Complete history and physical examination.
2. Behavioral assessment test at school and home (Conners' Rating Scales Revised CRS-R, Vanderbilt ADHD Diagnostic Rating Scales).
3. Audiological evaluation (subjective and objective tests) - Pure tone audiogram, speech audiometry, impedance audiogram, otoacoustic emissions, brainstem evoked response audiometry, as required. Children above 6 years must undergo testing for sound discrimination, auditory memory and language processing to rule out CAPD by determining if the child's ability to listen decreases if the background noise is slowly increased, and to the instructions spoken at faster speeds.
4. Language development assessment.
5. Assessment for learning disabilities, personality disorders and psychiatric disorders.
6. Cognitive assessment-IQ testing.
7. Neurological assessment, EEG, brain imaging.
8. Vision testing.
9. Polysomnography for sleep disorders if required.

The role of a developmental pediatrician in identifying children with behavioral abnormalities and motivating the parents on subjecting the children to a multievaluation process is vital. Pharmacotherapy is still a main treatment modality for ADHD, which has no role in CAPD, SNHL and language disorders. The beneficial effects of stimulants like methylphenidate, dextroamphetamine and pemoline on children with ADHD are proven in reducing the symptoms and improving the academic performance.[26] The role of an ophthalmologist- to rule out vision impairment, otologist and audiologist- to rule out hearing impairment, CAPD and adequate amplifications with hearing aids if needed, speech language pathologist for language disorders is obvious. The role of a psychiatrist in the assessment of attention deficit children includes, assessment for behavioral disorders with behavior rating scale test, learning disorders, psychiatric disorders, sleep disorders, personality assessment, IQ testing, providing psychoeducation to parents and children, behavioral therapy, cognitive behavioral therapy and pharmacotherapy when needed for psychiatric disorders. Coexisting seizure disorder, tic disorders, and other neurological problems requires a neurologist intervention in assessment and management.

The role of teachers at school in arranging assistive listening devices and acoustic environmental modifications is necessary to create an optimal listening environment, which is beneficial to children with ADHD and hearing loss. A quiet classroom with FM systems attached, reduces the amount of competing background noise which helps to concentrate and understand speech. Teaching skills with breaking large multistep process to smaller multiple steps, creating a check list of things to be done, using mnemonics to learn steps and sequences, incidental learning with stories and skits, using computer programmes and smart boards will be much beneficial.

Parents at home play a key role in seeking prompt medical advice, cooperating for multidisciplinary evaluation, dietary support with sugar restricted, additive-preservative free food rich in fibre, omega-3 fatty acids, iron, folate, and zinc which enhances the effectiveness of stimulant therapy in ADHD.[27] Finally special care and motivation from the parents will help these children to lead a better life in all aspects.

CONCLUSION

With such a comprehensive management with a multiprofessional approach, attention deficit children can be successful in school and lead productive lives.

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