Case report

SEIZURES PRESENTING AS ADHD: A CASE REPORT

ABSTRACT

ADHD (Attention Deficit Hyperactivity Disorder) is a neurodevelopmental disorder that affects a large proportion of children. ADHD is associated with an increased risk of seizures and is characterised by inattention, restlessness, and impatience.

An 8-year-old boy with ADHD presented to the Psychiatry Out-Patient Department with complaints of aggressive behaviour and restlessness. Trademark symptoms such as difficulty in sustaining concentration, not following instructions, running about, not being able to sit in one place, and verbally and physically abusive behaviour were noted in the patient.

Atomoxetine and Risperidone were prescribed for inattention and behavioural misconduct, respectively. The family background of seizure disorders led to further investigation with an EEG; it showed seizure activity suggestive of Generalised Tonic-Clonic Seizures. Administration of Sodium Valproate was initiated for the same and due to lack of improvement, the boy was started on Oxcarbazepine. Oxcarbazepine showed the most effective in treatment and progress continued with the intake of the drug. Currently, the boy is showing near total improvement and on Atomoxetine 20 mg, Oxcarbazepine 600 mg and Sodium Valproate 400 mg, all of the above in divided doses.

This case report aims at highlighting the manifestation of unprovoked seizure activity in a patient previously diagnosed with ADHD and conduct disorder.

Several medical conditions in children mirror ADHD symptoms, making diagnosis difficult. For accurate treatment, it's crucial to rule out a differential diagnosis. With the help of this case, we can shed some light on the lack of knowledge and protocols in the management of hyperkinetic disorders, which has resulted in the spike of misdiagnosed cases across the country.

KEYWORDS

Attention Deficit Hyperactivity Disorder, Seizures, Epilepsy, Generalised Tonic-Clonic Seizures.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that affects 7-9% of children and is associated with 6 symptoms of hyperactivity and impulsivity, or inattention (1). Symptoms that are severe enough to interfere with functioning are often noticed in school and at home before the age of 12 years. ADHD is known to have a strong genetic component with a greater risk in first-degree relatives of a patient with an ADHD diagnosis. Earlier research studies have shown that behavioural disturbances before the onset of the first seizure are common in children having unprovoked seizures (2). Spontaneous recurrent seizures are characteristic of epilepsy but can be a generalised condition in which seizures are one manifestation (3). Likewise, ADHD is also associated with increased vulnerability to educational and social disadvantages.

Recent research suggests that ADHD is a common comorbid condition in childhood epilepsy. However, there is very minimal information about the character, occurrence, and scheduling of corresponding neurobehavioural or psychological comorbidities, or the fundamental underlying cause of ADHD in epilepsy. A study of 75 children (ages 8-18) with new/recent-onset idiopathic epilepsy and 62 healthy controls conducted by Rosalind Franklin University of Medicine and Science, North Chicago, IL, USA found that children with epilepsy had a significantly higher rate of ADHD (31.5%) than controls (4).

In certain findings, ADHD and its epilepsy consequences seem to have a history before epilepsy assessment and indeed the first identified seizure, as in the case we've described. These cases may not have any obvious links to conventional clinical epilepsy, individual variables, psychological symptoms (loneliness/depression), or discrepancies during pregnancy or childbirth.

To create policies and design effective interventions, it is necessary to first understand the scope of ADHD and associated conditions. As a result, the purpose is to find out how common ADHD comorbidity and associated variables are among epileptic children. In this report, we present an interesting case of ADHD with conduct disorder as well as seizure disorder, childhood-onset, initially presenting to the psychiatric out-patient department with typical features of the same.

CASE PRESENTATION

Our patient is an 8-year-old male child, studying in Grade 3, observed to be overactive with growing restlessness and aggressiveness. When the boy was two months old, his parents split, and he currently lives with his maternal grandmother (his primary caretaker). His mother remarried and now stays with her new spouse and children, and his biological father passed away due to an

unknown illness. An examination of his family history revealed that both his father and paternal grandfather had mental illnesses. His half-brother has recently been diagnosed with conduct disorder.

He started schooling at the age of 6. In the classroom, he was said to be frustrated and irritable in class, pick fights with peers, and have poor social skills. Although he is of average intellect (IQ-81), he struggles with reading and writing, and he falls far short of all national literacy and numeracy standards. His academic underachievement challenges his motivation.

According to the grandmother, the child began to exhibit symptoms such as agitation, restlessness, poor attention span, being "always on the go", breaking things, and physical aggression toward the grandmother and classmates.

He had a lower tolerance for irritation and had trouble forming and keeping long-term relationships as well as reading nonverbal interactions. There have been several instances where violent behaviour has been displayed against the security guards of the hospital during the follow-up visits.

He was said to have had less sleep, was unable to concentrate on his studies, and was also seen banging his head on the floor for no apparent reason. He was unable to sit still. He also bites her, she claims. Later on, he feels guilty and apologizes for his actions. When he wasn't irritable, he was seen as a sensitive young boy who cared about his grandmother.

He was first diagnosed with ADHD when he was 7 years old and was started on Atomoxetine 10mg per day, followed with Risperidone 1mg per day to treat behavioural changes and irritability. The patient's inattention improved, but not his physical aggression or restlessness.

After 3 months of starting treatment, the child's grandmother reported that the child was not getting better with medicine. He was still occasionally physically aggressive and verbally abusive. Restless and irritable moods were also reported

by his grandmother. The doses were gradually increased to 20 mg and 2 mg per day, respectively.

At 8 years of age, when the patient came for follow-up in the OPD, his grandmother complained of frequent destruction to property at home. His aggressiveness was said to be directed at his primary caretaker. He would mostly get aggressive with his grandmother. However, if left with someone else, he gets even more cranky and aggressive. He would easily be distracted by his surroundings and the activity around him. He was observed to be disorganised and had difficulty completing tasks. He would also fidget a lot and keep moving around objects. He was not regular with the follow-up; however, he was regular with the medicines.

An EEG was done to rule out comorbid seizure disorders, also due to the reason that the patient's half-brother who is younger than him had a history of seizure disorder and was receiving treatment. Once the EEG was done, the results showed generalized seizure activity. The patient was analyzed based on the EEG report and history inspection, through which the diagnosis of ADHD with Conduct Disorder with Generalized Tonic-Clonic Seizures was made. The medical treatment for GTCS was initiated with the administration of Sodium valproate 400 mg, following which the patient did not give a positive response or any kind of improvement.

Three months later, Oxcarbazepine 600 mg was added, resulting in the decrease of seizure episodes. Successive EEGs revealed no seizure activity confirming the same.

After the addition of Oxcarbazepine, the patient's behaviour improved significantly, and he began attending school regularly, with no additional complaints from his teachers or peers. He continued to take his medications as prescribed. He was cooperative and was doing much better. He obeyed his

grandmother and there were a few incidents where he bit his grandmother. He had taken a new interest in flying kites and enjoyed it as well.

Currently, he shows near-total improvement in his symptoms, and he is maintaining well on Oxcarbazepine 600 mg/day, and Sodium valproate 400 mg/day and Atomoxetine 20mg/day.

DISCUSSION

ADHD affects 5-7% of children with typical development (5), but it affects 20-40% of children with epilepsy (6). Seizures are more common in children with ADHD, with around 14 per cent of children with ADHD experiencing seizures (7). In children with epilepsy, the most common disorder is attention deficit hyperactivity disorder (ADHD). According to studies, 30 to 40 in every 100 epileptic children have ADHD, compared to 7 to 9 in every 100 children with typical development (5). Also, rates were higher among the male children (66.7%) than among the females (33.3%) (8). In a study conducted in 2017 assessing the prevalence of ADHD and its comorbidities in children (6-12 years) with tertiary-level epilepsy, inattentive types of ADHD were more common in this patient population than aggressive or combined hyperactivity-impulsivity types (9). A similar prevalence rate of 23.4 per cent of children with epilepsy and concomitant ADHD was reported by outpatients in paediatric neurology in Karnataka (10).

Our 8-year-old patient was abusive with an aggressive character at the time of presentation. His final diagnosis is ADHD with conduct disorder presenting with generalised seizures (as seen in the EEG activity). He was given a trial of Risperidone, to alleviate behavioural symptoms of aggression. Risperidone was gradually tapered and stopped. He was also given Atomoxetine for

hyperactivity and inattention and antiepileptic drugs, like sodium valproate and oxcarbazepine for seizure activity.

In a common Indian scenario, multitudinous cases of epilepsy, depression, sleep disturbances, neurological soft signs, bipolar-mood disorder, epistaxis, X-linked adrenoleukodystrophy, and various other comorbidities are often misdiagnosed as ADHD.

It is difficult to say exactly how many children in the world have ADHD because different countries have chosen a different way to diagnose it. A clear understanding of the effects of medications on the clinical manifestations and development of epilepsy and concomitant ADHD should adapt medical management in this population.

ADHD is diagnosed according to the American Psychiatry Association's DSM 5 Standard Diagnostic Statistics and Manual (5th edition) criteria (11). In addition, the diagnosis & management of ADHD with or without epileptic episodes remains unspecified in the current psychiatric knowledge barrier.

Most epileptic characteristics do not change substantially amongst groups with and without ADHD, although ADHD is associated with an abnormal EEG. Epilepsy and ADHD affect children's IQ scores and make them hardly possible to attend school, with epileptic seizures being its main cause. It is correlated with adverse impacts on response hindrance, aggressive or disruptive behaviour, and parenting-related pressure. ADHD is also linked to a significant financial strain, parental love and care, and societal healthcare aids (12). Consequently, in those children with ADHD, the quality of life may be challenged. Managing ADHD requires a great amount of time-varying from many months to years.

Limitations of similar management criteria include restricted research in Indian psychiatry, abuse & dependence on anti-epileptic drugs, methylphenidate

overdose leading to suicide ideation, and poor prognosis. The chances of multiple psychiatric illnesses among the paediatric population are a rare phenomenon and increase the probability of errors in diagnosis.

When a child presents with ADHD and epilepsy, it is vital to develop an intervention approach that identifies both the diseases by collaborating with health care experts who are acquainted with epilepsy, behaviour, and thinking.

ADHD symptoms can make diagnosing epilepsy more difficult because they can be mistaken for seizures. Seizures must be treated first if a person is experiencing them. Some of the symptoms associated with ADHD may improve if seizures are controlled.

To alleviate the manifestations, deal with both illnesses, improve general mental & emotional well-being, and maintain social interactions, subjective interventions should be considered for each individual. In many of these therapies, family engagement is crucial as well.

The medical network in India should be cautious while diagnosing children who present with hyperactivity. Symptoms must be properly filtered using diagnostic screening tests - both behavioural and medical screening tests, because the same can present itself with other disorders and lead to misdiagnosis.

LIST OF ABBREVIATIONS

ADHD – Attention deficit hyperactivity disorder

EEG – Electroencephalography

GTCS – Generalized Tonic-Clonic Seizure

IQ – Intelligence Quotient

OPD – Out Patient Department

ETHICS APPROVAL & CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Informed consent for publication was obtained from grandmother, the primary caretaker of the child.

AVAILABILITYT OF DATA & MATERIALS

Not applicable.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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