International Journal of Childhood and Development Disorders

E-ISSN: 2710-3943
P-ISSN: 2710-3935
IJCDD 2022; 3(1): 01-03

www.rehabilitationjournals.com
Received: 02-11-2021
Accepted: 05-12-2021

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Seizure disorder masquerading as ADHD in a child: A case report

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DOI: https://doi.org/10.22271/27103935.2022.v3.i1a.5

Abstract
Seizures are the most common pediatric neurologic disorder, with 4%-10% of children suffering at least one seizure in the first 16 years of life. Children with epilepsy are almost five times more likely to have psychiatric problems than the general population. Specific childhood comorbidities include attention-deficit hyperactivity disorder, autism, and developmental disabilities. Behavioral disturbance is observed more frequently in people with drug-resistant epilepsy, frequent seizures with associated neurological abnormalities. Behavioral disorders may precede, occur with, or follow a diagnosis of epilepsy. The relationship between epilepsy and ADHD is complex and not well understood and has not been well described, but clinically there is a perception that ADHD is more common among children with epilepsy. Hereby we report a case of 7-year-old girl with seizure disorder with behavioral disturbances who was misdiagnosed and treated as ADHD initially.

Keywords: Seizure disorder, behavioral disturbances, ADHD, autism spectrum disorder

Introduction
Seizures are the most common pediatric neurologic disorder, with 4% to 10% of children suffering at least one seizure in the first 16 years of life. The incidence is highest in children younger than 3 years of age, with a decreasing frequency in older children [1]. Epidemiologic studies reveal that approximately 150,000 children will sustain a first-time, unprovoked seizure each year, and of those, 30,000 will develop epilepsy [2].

Seizure disorder is a chronic condition with a confounding array of effects on children. As with other chronic medical conditions, the repetitive, unpredictable seizures that characterize epilepsy can hinder the physical, cognitive, and emotional tasks of normal child development. Only 20% to 40% of cases are associated with an identifiable cause, such as a chronic brain lesion or a genetic susceptibility to seizure development. Most cases of epilepsy must be described solely based on symptoms, clinical findings, and electroencephalographic patterns [2].

Seizure disorder is commonly associated with behavioral changes. Children with epilepsy have been noted to be at elevated risk (five times) for behavioral and mental health problems in population-based studies. Central nervous system damage and low intelligence pose added risks. Interactions of psychosocial and biological variables can have additional effects [3]. Most of the studies done in developing countries were not designed to examine which risk factors were associated with psychopathology. Furthermore, very few studies have used multivariate techniques to attempt to establish the relative importance of the several types of variables, i.e., demographic, seizure related and treatment related variables. Children who are diagnosed with epilepsy may benefit from a psychiatric consultation because of the multiple individual, family, academic, and systemic factors that may impact them because of this diagnosis [3]. The psychiatric consultation should take into consideration several factors, including developmental issues, family issues, quality-of-life concerns, psychosocial factors, academic concerns, and potential comorbidity with other psychiatric disorders [3].

Attention deficit hyperactivity disorder (ADHD) is a condition first manifest in childhood characterized by severe and persistent symptoms of inattention, over-activity, and impulsiveness and is associated with long-term educational and social disadvantage [4]. ADHD and seizures may be co-morbid conditions, and inattention and hyperactivity are two common behavioral symptoms reported in those with childhood epilepsy [4]. However, the relationship between epilepsy and ADHD is complex and not well understood and has not been well described, but clinically there is a perception that ADHD is more common among children with epilepsy [5].

Due to the frequency and severity of emotional and behavioral problems in children with epilepsy a comprehensive seizure disorder clinic should provide evaluation and treatment of psychiatric problems but difficulties are often either unrecognized or assessment and care are not available [6]. Early reports of behavioral difficulties experienced by children with epilepsy suggested that they were at a substantial risk for symptoms of ADHD [4]. Hereby we report a case of 7-year-old girl with seizure disorder with behavioral disturbances who was misdiagnosed and treated as ADHD initially.

Case report: - Index patient was a 7-year-old girl, studying in 3rd standard belonging to low socio-economic status, Hindu nuclear family, from rural background in central India, family history of suicide in paternal uncle, alcohol dependence syndrome in maternal uncle, total duration of illness 4 months which was abrupt in onset, continuous and gradually progressive. The child presented with her mother to psychiatry OPD with chief complaints of hyperactivity, inattentive behavior, lack of attention in studies, unprovoked anger, irritability in the past 3-4 months. Her mother apparently reported that the child has started becoming restless and does not sit at one place for some time, keeps on fidgeting from one place to another and would disturb all other family members and would not follow the commands of her parents which was unlike her previous self. She also complained of lack of attention in studies. According to the mother, the patient is not that academically good in studies but she used to sit and study as taught by her teachers and her parents but in the last 3-4 months, she started exhibiting lack of attention in studies, she started getting distracted easily by seeing anything around her and does not follow commands of her parents and does not study as taught by her teachers and her parents. She also started getting irritable at trivial issues and started misbehaving with her parents and her siblings. She would argue with her parents and would shout at them if scolded and would also hit her mother back if mother tries to be strict with her or beat her. Following these complaints, the patient was primarily taken to a pediatrician by her mother. She was diagnosed as a case of? Autism spectrum disorder and was started on Tab. Valproic acid 400 mg in divided doses, Tab. Risperidone 0.5 mg. Her mother reported modest improvement on these medications for a period of 15 days and was referred to a pediatric neurologist. After consulting a pediatric neurologist, she was diagnosed as case of attention deficit hyperactivity disorder (ADHD) and was started on Tab. Atomoxetine 10 mg, gradually increased to 20 mg for a period of 1 month. Her mother reported no improvement on this treatment and thus was referred to a psychiatrist for behavioral therapy. On visiting the psychiatry OPD, the patient was evaluated for above mentioned symptoms and was diagnosed as a case of ADHD and was started on Tab. Methylphenidate 30 mg in divided doses for a period of 15 days. Her mother again reported to psychiatry OPD within 2 days with complaints of worsening of the symptoms on the medication.

In this visit to psychiatry OPD, an episode of abnormal jerky movements of both the upper limbs, associated with up rolling of eyeballs, protrusion of tongue, loosening of limbs, not associated with clenching of teeth, tongue bite, micturition and defecation were witnessed. These movements lasted for 1-2 minutes only after which the child started activities like jumping, hair pulling, crying, clapping hands, followed by drowsiness and then sleep. After witnessing these movements and behavioral symptoms, history was re-explored and she was advised admission in psychiatry ward. EEG Brain was done which showed rhythmic synchronous 5-7 hz theta activity were seen in bilateral hemisphere, intermittent repetitive sharp and high amplitude waves which were generalized in manner reflecting ongoing ictogenic discharges secondary to underlying cause. All routine blood investigations including thyroid profile were done which were within normal limits. MRI brain was done which showed no obvious abnormality in brain parenchyma (Figure A & B).

Birth and developmental history revealed full term vaginal institutional delivery, cried immediately after birth, birth weight was 2.75 kg. Antenatal period was uneventful but meconium-stained liquor was found after the birth for which she was kept in neonatal ICU for 2 days. There was no history of developmental delay and no history of neurotic traits.

The patient started schooling at 5 years of age. Currently studying in 3rd standard in primary school. She is academically poor and would not show interest in subjective writing. She learns well when taught verbally. According to the mother, she exhibits no history of lying, stealing, truancy, bullying, cruelty towards animals and disobedience. On MSE, the patient was conscious, uncooperative for examination, oriented to time, place and person. She was averagely groomed, moderately built, kempt and tidy. She was not sitting at one place and was continuously fidgeting from one room to other in the OPD section. Patient would start getting aggressive and was shouting at mother if mother tried to hold her or control her. There was inability to establish rapport by the interviewer. Psychomotor activity was exaggerated. Affect was found to be reactive. Mood, thought and perception couldn't be assessed as patient was not responding to the interviewer and was uncooperative.

She was diagnosed as a case of Seizure disorder with behavioral disturbances. She was started on Tab. Valproic acid 400 mg in divided doses, Tab. Risperidone 1 mg and tab. Folic acid 5 mg. Patient's mother reported more than 80% improvement in symptoms after the discharge. There was no seizure activity reported and behavioral symptoms too improved. But there was complaints of increased appetite and weight gain. Her weight had increased by 5 kg in 1 month. Therefore, on subsequent follow up in the OPD, valproic acid was gradually tapered and stopped and simultaneously she was started on tab. Phenytoin 5 mg/kg which was gradually increased to 8mg/kg, and tab. Clobazam 5 mg Sos. EEG brain was repeated after 2 months which was normal.

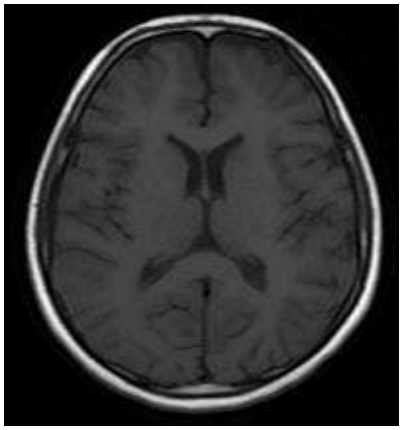

Fig A-T1: Axial section

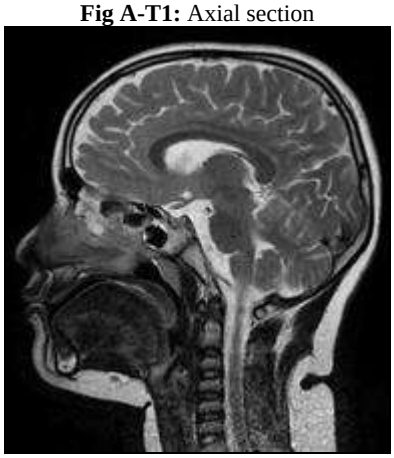

Fig B-T2: Sagittal section

Discussion

We hereby report a case of a 7-year-old girl with seizure disorder who was misdiagnosed with ADHD by two independent psychiatrists after cross sectional assessment and treated with stimulants.

Early reports of behavioral difficulties experienced by children with epilepsy suggested that they were at a high risk for symptoms of ADHD [4]. Seizure disorder may be seen in children with ADHD or may exhibit symptoms similar to inattentiveness of ADHD. Thus, the differential diagnosis between ADHD, predominantly the inattentive type, and seizure can be challenging [7]. Both ADHD and absence seizures may coexist in a patient at the same time and antiepileptic medications may lead to attention difficulties, irritability, and hyperactivity. Thus, the differential diagnosis between ADHD, especially the inattentive type, and seizure disorder can be confounded by the overlap in symptoms that are related to both conditions [7]. In this context, our case was misdiagnosed with ADHD in initial follow ups and received inappropriate medications: methylphenidate. The diagnoses of ADHD and seizure disorder are strongly based on behavioral descriptions of the patients. There is no laboratory test for ADHD, and the diagnosis is dependent on family and school assessments, behavioral history, and clinical observation [7]. Although, EEG assists the diagnosis of seizure disorder, the description of the events is very important for diagnostic accuracy, especially when the EEG is unremarkable. As seen in our case, the detailed medical history and witnessing the symptoms in OPD allowed us to consider a diagnosis as seizure disorder. Differentiating between ADHD and seizure disorder is of vital importance, as the misdiagnosis may cause a delay for proper treatment or lead to inappropriate medication regimens for each condition [7]. This is more critical in children, when early diagnosis and appropriate management can significantly improve behavioral problems, social interaction, and academic performance. The key points for the early diagnosis and treatment may include a detailed medical history, regular evaluations, and increased clinical awareness. In addition, clinicians may reconsider the diagnosis and conduct further evaluations when the patients have given inadequate responses to treatment, as we did.

Conclusion

His case throws light on the fact that children with seizure disorder can be misdiagnosed with ADHD depending upon the presentation and cross-sectional assessment. Clinicians should be cautious enough to do a complete assessment including history, examination, investigations from relevant sources as and when necessary.

Conflict of interest: None

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