ISSN: 2279 - 0594

Journal of Biomedical and Pharmaceutical Research

Available Online at www.jbpr.in

CODEN: - JBPRAU (Source: - American Chemical Society)

Index Copernicus Value: 72.80

(National Library of Medicine): ID: (101671502)

Volume 7, Issue 2: March-April: 2018, 113-116

Research Article

Attention-Deficit Hyperactivity Disorder in Children with Idiopathic Epilepsy

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Abstract

Background: Attention-Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder affecting children, characterized by symptoms of inattention, hyperactivity, and impulsivity. The coexistence of ADHD in children with epilepsy is increasingly being recognized, particularly in those with idiopathic epilepsy. Idiopathic epilepsy refers to seizures of unknown cause but is often linked to abnormal brain activity that may predispose children to attention-related problems.

Aim: This study aims to assess the prevalence of ADHD in children diagnosed with idiopathic epilepsy and to explore the clinical characteristics and comorbidities associated with this dual diagnosis.

Methods: A case-control study was conducted involving children diagnosed with idiopathic epilepsy (n=60) and a control group of children with no neurological disorders (n=60). ADHD symptoms were assessed using standardized diagnostic criteria (DSM-5), and cognitive assessments were conducted to evaluate attention and behavior.

Results: The prevalence of ADHD in children with idiopathic epilepsy was found to be 28%, significantly higher than the 8% prevalence observed in the control group. The majority of children with ADHD had a history of generalized seizures. Seizure frequency and treatment with antiepileptic drugs were associated with higher ADHD symptoms in these children.

Conclusion: ADHD is prevalent in children with idiopathic epilepsy, with a marked increase in children with frequent or uncontrolled seizures. This highlights the need for comprehensive management strategies that address both seizure control and attention-related symptoms in affected children.

Keywords: Attention-Deficit Hyperactivity Disorder, ADHD, Idiopathic Epilepsy, Seizures, Cognitive Function, Pediatric Neurology.

Introduction:

Attention-Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders in children, characterized by symptoms such as inattention, impulsivity, and hyperactivity (1). ADHD affects approximately 5-7% of children worldwide and can lead to significant academic and social challenges if left untreated (2). It is well documented that ADHD is often comorbid with other psychiatric and neurological conditions, one of the most prevalent being epilepsy.

Epilepsy is a neurological disorder marked by recurrent seizures, and its effects on cognition and behavior are widely acknowledged. The relationship between ADHD and epilepsy has garnered increasing interest in recent years, with studies suggesting that children with epilepsy are at a higher risk of developing ADHD compared to the general population (3). Specifically, idiopathic epilepsy, a type of epilepsy with no clear underlying cause, is one of the epilepsy subtypes where the coexistence of ADHD is often observed.

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Idiopathic epilepsy typically involves generalized or focal seizures and has a significant impact on brain function, particularly in areas responsible for attention, executive function, and behavior regulation (4).

The clinical manifestations of ADHD in children with epilepsy may differ from those in the general population, with the presence of seizure-related cognitive deficits potentially exacerbating attention and behavioral problems. Seizures, along with the effects of antiepileptic drugs (AEDs), can contribute to cognitive impairment and behavioral dysregulation, making it challenging to distinguish ADHD symptoms from epilepsy-related issues (5). Furthermore, the treatment of ADHD in children with epilepsy is complex, as certain stimulant medications may exacerbate seizures, requiring careful management.

Despite the growing recognition of the overlap between ADHD and epilepsy, especially in children with idiopathic epilepsy, few studies have examined the prevalence and clinical characteristics of this dual diagnosis. This study aims to fill this gap by evaluating the prevalence of ADHD in children with idiopathic epilepsy, exploring the relationship between seizure activity and ADHD symptoms, and identifying potential contributing factors.

Aim and Objectives

Aim:

To assess the prevalence of ADHD in children with idiopathic epilepsy and to examine its clinical characteristics.

Objectives:

1. To determine the prevalence of ADHD in children diagnosed with idiopathic epilepsy compared to a control group of children without epilepsy.
2. To investigate the impact of seizure frequency and antiepileptic drug usage on the severity of ADHD symptoms in children with idiopathic epilepsy.

Materials and Methods

Study Design:

This was a cross-sectional case-control study conducted at a pediatric neurology clinic. A total of 120 children participated, with 60 children diagnosed with idiopathic epilepsy and 60 age-matched children without any neurological disorders forming the control group. Both groups were selected based on specific inclusion and exclusion criteria.

Inclusion Criteria:

- Children aged 6-12 years.
- Diagnosis of idiopathic epilepsy for at least 12 months.
- No other major neurological disorders (e.g., cerebral palsy, brain injury).
- Ability to participate in clinical assessments and behavioral evaluations.

Exclusion Criteria:

- Children with other types of epilepsy (e.g., symptomatic or cryptogenic epilepsy).
- Children with comorbid psychiatric disorders other than ADHD (e.g., autism spectrum disorder).
- Children with significant developmental delays or cognitive impairments that could interfere with behavioral assessments.

Assessment Tools:

ADHD symptoms were evaluated using the DSM-5 diagnostic criteria. The Conners' Parent Rating Scale-Revised (CPRS-R) was used to assess the severity of ADHD symptoms in children. Seizure frequency, type of seizures, and antiepileptic drug treatment were obtained from medical records. Cognitive assessments were conducted to evaluate attention and executive

functioning using standardized tests such as the Continuous Performance Test (CPT).

Statistical Analysis:

Descriptive statistics were used to summarize demographic characteristics. The prevalence of ADHD was compared between the two groups using chi-square tests. The correlation between seizure frequency, medication use, and ADHD severity was assessed using Pearson's correlation coefficient. A p-value of <0.05 was considered statistically significant.

Results

Table 1: Demographic Characteristics of Study Participants

Characteristic	Idiopathic Epilepsy Group (n=60)	Control Group (n=60)
Mean Age (years)	8.4 ± 1.5	8.2 ± 1.6
Male/Female Ratio	1.2:1	1.1:1
Seizure Type (Generalized/Focal)	40/20	N/A
Medication (AEDs)	55% (on AEDs)	0%

Table 2: Prevalence of ADHD and Seizure-Related Factors in the Idiopathic Epilepsy Group

ADHD Symptom Severity	Mild	Moderate	Severe	No ADHD Symptoms
Percentage of Children	12%	28%	16%	44%

The prevalence of ADHD symptoms in the idiopathic epilepsy group was 56%, with 12% of children displaying mild ADHD symptoms, 28% moderate, and 16% severe. The control group showed a significantly lower prevalence of ADHD (8%).

Table 3: Correlation Between Seizure Frequency and ADHD Severity in the Epilepsy Group

Seizure Frequency (per month)	ADHD Severity (Mild/Moderate/Severe)
<1	10%
1-5	30%
>5	60%

Children with more frequent seizures showed more severe ADHD symptoms. The majority of children with severe ADHD symptoms had seizures occurring more than five times per month.

Discussion

This study indicates a significant prevalence of ADHD in children with idiopathic epilepsy, with 56% of children in this group showing ADHD symptoms. This finding is consistent with previous studies, which have reported a higher rate of ADHD in children with epilepsy compared to the general population (6). The association between seizure frequency and ADHD severity is particularly noteworthy, with children who had more frequent seizures exhibiting more severe ADHD symptoms. This supports the hypothesis that frequent seizures may exacerbate cognitive and behavioral dysfunction in children with epilepsy (7).

Moreover, the use of antiepileptic drugs (AEDs) is an important factor to consider, as some medications may contribute to cognitive impairment and attention difficulties. However, the exact role of AEDs in the development or worsening of ADHD symptoms remains

unclear, and further research is needed to explore this relationship in more detail (8).

Our study also found that children with idiopathic epilepsy and ADHD had a higher prevalence of generalized seizures, which are often associated with more widespread brain involvement. This could explain the more pronounced attention and behavior issues in these children compared to those with focal seizures, who may have more localized brain dysfunction (9).

Given the high prevalence of ADHD in children with idiopathic epilepsy, it is crucial for clinicians to screen for ADHD symptoms when managing children with epilepsy. Early diagnosis and appropriate treatment can help improve the quality of life and functional outcomes for these children.

Conclusion

This study highlights the high prevalence of ADHD in children with idiopathic epilepsy and the association between seizure frequency and ADHD severity. Comprehensive management strategies that address both seizure control and attention-related symptoms are essential in improving the overall outcomes for these children. Further research is needed to better understand the neurobiological mechanisms underlying the co-occurrence of ADHD and epilepsy and to optimize treatment approaches.

References

1. Pincus HA, Williams JW, Paton M, et al. Epidemiology of attention-deficit/hyperactivity disorder in children and adolescents. J Clin Psychiatry. 2000;61(11): 41-52.
2. Faraone SV, Biederman J, Mick E. The age-dependent decline of attention-deficit/hyperactivity disorder: a meta-analysis of the age of onset and course of the disorder. J Am Acad Child Adolesc Psychiatry. 2006;45(6): 634-642.
3. Hirtz D, Berg AT, Callenbach PM, et al. How common are the comorbidities of epilepsy in childhood? Epilepsia. 2007;48(5): 1121-1129.
4. Rantanen K, Kyllönen H, et al. Cognitive dysfunction and ADHD in children with epilepsy. Epilepsy & Behavior. 2012;24(2): 234-240.
5. Lendrum R, Sheehan L, et al. Effects of antiepileptic drugs on cognitive function in children with epilepsy. Seizure. 2008;17(2): 178-182.
6. Gaitatzis A, Carroll K, et al. Attention-deficit hyperactivity disorder and epilepsy: A prospective study. Epilepsia. 2003;44(6): 1801-1807.
7. Chou I, Wong F, et al. Seizure frequency and cognitive function in children with epilepsy: A systematic review. Seizure. 2006;15(4): 208-216.
8. Broadbent-Hume J, St Clair H, et al. Medication-related cognitive impairment in children with epilepsy. Neuropediatrics. 2009;40(2): 78-84.
9. Thompson P, Birmaher B, et al. Bipolar disorder and epilepsy: A review of the literature. Bipolar Disord. 2010;12(6): 654-663.