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Psychiatric Comorbidities in Adolescents with Epilepsy: A Cross-Sectional Study

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Abstract: ***Background: Epilepsy in adolescents is frequently associated with psychiatric comorbidities that may worsen disease control and quality of life. Data from Indian settings remain limited. Purpose: To determine the prevalence and associated risk factors of psychiatric comorbidities in adolescents with epilepsy. Methods: In this cross-sectional study, 80 adolescents aged 10 to 18 years attending a tertiary epilepsy clinic were screened using MINI-KID version 7.0.2. Clinical variables including seizure type, duration, antecedent neurological events, antiepileptic drug use, EEG, and neuroimaging findings were analysed. Results: Psychiatric comorbidity was identified in 26.3% of participants, with 12.5% having multiple disorders. Oppositional defiant disorder was the most common diagnosis, followed by attention deficit hyperactivity disorder and conduct disorder. Antecedent neurological events were significantly associated with psychiatric morbidity, whereas seizure type, duration, AED use, EEG, and neuroimaging findings were not. Conclusion: Psychiatric disorders are common among adolescents with epilepsy, highlighting the need for routine mental health screening in comprehensive epilepsy care.***

Keywords: Epilepsy; Adolescents; Psychiatric comorbidity; Attention-deficit hyperactivity disorder; Oppositional defiant disorder; Antiepileptic drugs.

1. Introduction

Epilepsy in adolescents is a significant neurological burden. Psychiatric disorders constitute a significant amount of the morbidity related to epilepsy [1]. These comorbidities increase duration of uncontrolled epilepsy, leading to increased disability affected life years. Parents also limit their social interactions which results into emotional reaction in the form of anger, anxiety, and depression [2]. There is a general lack of awareness for assessing psychiatric co-morbidities while treating epilepsy in adolescents by the physicians. We conducted this study to assess these psychiatric disorders in adolescents with epilepsy.

2. Materials and Methods

A cross-sectional observational study was conducted among adolescents aged 10–18 years with a known diagnosis of epilepsy who had been receiving at least one anti-epileptic drug for the preceding six months. The study was carried out in the Child Epilepsy Clinic after obtaining approval from the Institutional Ethics Committee.

Adolescents with seizure disorders associated with intellectual disability, neurocognitive developmental disorders, or any other chronic illness such as asthma, diabetes mellitus, or hypo-/hyperthyroidism were excluded. Written informed consent was obtained from the parents or legally authorised representatives.

All enrolled participants were screened for psychiatric comorbidities using the **MINI-KID English version 7.0.2**. Demographic characteristics, seizure type and duration, number and duration of anti-epileptic drugs, and relevant perinatal history (prematurity, birth asphyxia, hypoglycaemia, sepsis, hyperbilirubinemia, and NICU admission) were recorded using a semi-structured proforma. Past medical history, including febrile seizures, meningitis, encephalitis, and head trauma, was also documented. Participants who met the diagnostic criteria according to the screening tool were included in the analysis and were referred to mental health professionals for further evaluation and management.

Statistical analysis was performed using the chi-square test and the independent t-test. When the data were not normally distributed, appropriate non-parametric tests were applied. A p-value of <0.05 was considered statistically significant.

A total of 95 adolescents were screened, of whom 80 completed the study, with a male-to-female ratio of 1.5:1. Participants were categorised into two groups: early adolescents (10–14 years) and late adolescents (14–18 years). Most participants (92.5%) had no significant perinatal history, while 15 (18.8%) reported a history of antecedent events.

Seizure types were classified according to the International League Against Epilepsy 2017 classification [3]. Most participants, 57 (71.3%), experienced generalized tonic–clonic seizures, while 23 (28.7%) had focal seizures. None of the participants reported any change in seizure semiology during the study period. The mean duration of epilepsy among the participants was 40.50 ± 32.87 months.

At the time of enrolment, 47 (58.8%) participants were receiving monotherapy for epilepsy. The maximum number of anti-epileptic drugs used was four, reported in only one participant (1.25%). Participants with a recent electroencephalogram (EEG) report performed within the preceding 12 months were evaluated for abnormal activity, and most were found to have normal EEG findings. Among

those with abnormalities, focal onset epilepsies were most reported (34.8%).

Neuroimaging findings were normal in most participants. Among abnormal findings, calcified or healed granuloma was the most frequently observed lesion (52.1%).

Study Tool

THE MIN.I KID 7.0.2 ENGLISH VERSION

The Mini-international Neuropsychiatric Interview for Children and Adolescents is a short structured diagnostic interview, developed by psychiatrists in United States and Europe, for Diagnostic and statistical manual of Mental disorders 4th edition and ICD-10 psychiatric disorders [4]. It screens psychiatric disorders with a sensitivity and specificity of 0.61 to 1 and 0.81 to 1 respectively with an administration time of approximately 15 minutes [5].

3. Results

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Neuroimaging findings were normal in the majority of participants. Among abnormal findings, calcified or healed granuloma was the most frequently observed lesion (52.1%).

A total of 21 participants (26.3%) were found to have psychiatric comorbidities. Oppositional Defiant Disorder (ODD) was the most common psychiatric comorbidity, observed in 21 participants (26.3%). Attention Deficit Hyperactivity Disorder (ADHD) was identified in 10 participants (12.5%), while Conduct Disorder (CD) was present in 5 participants (6.3%). No other psychiatric comorbidities were identified among the participants.

All 5 participants (6.3%) diagnosed with CD also had comorbid ADHD and ODD. Among the 10 participants diagnosed with ADHD, 5 (50%) had comorbid ODD alone, whereas the remaining 5 (50%) had both CD and ODD.

Psychiatric comorbidity was present in 28.1% (16/57) of adolescents with Generalized Tonic–clonic Seizures and in 21.7% of those with Focal Seizures. None of the participants with a history of significant perinatal events were found to have any psychiatric illness.

The prevalence of psychiatric comorbidity was higher among participants with significant antecedent events (53.3%) compared with those without such events (20%). Most participants with psychiatric comorbidities had normal findings on Electroencephalography and neuroimaging.

4. Discussion

Adolescence is a critical neurodevelopmental period characterized by ongoing cortical maturation, hormonal influences, and evolving psychosocial changes that may affect epilepsy expression and psychiatric vulnerability. The 10–18 years age group was stratified as psychiatric comorbidity and epilepsy characteristics vary with age and brain maturation, as described by Wirrell E [6]. Sex-related differences in seizure patterns and psychiatric outcomes may be influenced by hormonal modulation of neuronal excitability. Oestrogen is believed to enhance epileptiform activity, whereas progesterone and testosterone may exert inhibitory effects. Choudhary et al [7] reported that male sex was more frequently associated with ADHD in childhood epilepsy, the association was not statistically significant ($p = 0.33$) in our study, suggesting that gender may not independently predict psychiatric morbidity.

Perinatal factors were assessed in all participants. Only 7.5% had a significant birth history, and none of them demonstrated any psychiatric comorbidity. However, Tunc G et al. [8] reported neonatal jaundice as a potential risk factor for Autism spectrum disorder.

Antecedent neurological events were significantly associated with psychiatric comorbidity in our study ($p < 0.01$), particularly oppositional defiant disorder. Bertelsen et al [9] and Ku et al [10] observed that febrile seizures increase the risk of subsequent ADHD. These findings suggest that early neurological insults may disrupt neurodevelopmental pathways, increasing behavioural vulnerability. Kuzman et al [11] reported that focal seizures were associated with obsessive-compulsive disorder, while GTCS increased the risk of phobias. Wang et al [12] found that longer seizure duration increases ADHD risk, and Kwong et al [13] reported seizure duration as a risk factor for anxiety and depression. In contrast, seizure duration was not statistically significant in our study ($p = 0.14$). The number and duration of antiepileptic drugs (AEDs) have been identified as risk factors for ADHD by Choudhary et al [7] and Wang et al [12], possibly due to cognitive and behavioral side effects. Although a similar trend was noted, statistical significance was not achieved in our cohort. Choudhary et al [7] also observed a higher prevalence of ADHD in children with abnormal EEG findings, and Dal Canto et al [14] reported that interictal EEG abnormalities increase psychiatric risk. In our study, it was statistically insignificant ($p = 0.10$).

Saute et al [15] described diffuse cortical thinning and subcortical volume reductions in children with epilepsy and

ADHD. Stevens MC and Haney-Caron [16] reported reduced grey matter volume in adolescents with conduct disorder. Although 28.7% of participants had neuroimaging abnormalities, no significant association with psychiatric comorbidity was found. Kuzman et al [11] described obsessive-compulsive, depressive, anxiety, and aggressive symptoms as common comorbidities. ADHD prevalence in our study was 12.5%, lower than the 23% reported by Choudhary et al [7] and 24.7% by Wang et al [12]. GTCS was more common among patients with ADHD, conduct disorder, or ODD, though not statistically significant. Antecedent factors were significantly associated with ODD ($p < 0.01$).

5. Conclusion

Psychiatric comorbidities are prevalent among adolescents with epilepsy and should be routinely screened as part of comprehensive epilepsy management. Early identification of these psychiatric co-morbidities may foster appropriate care, limiting the worsening of psychiatric symptoms and their impact on quality of life and health status. Larger longitudinal studies are warranted to clarify causal associations and long-term outcomes.

Conflicts of Interest: None

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