EDITOR'S CHOICE ARTICLE

EARLY PREDICTORS OF REMISSION IN CHILDREN AND ADOLESCENTS WITH NEW-ONSET EPILEPSY

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Epilepsy, a neurological disorder affecting millions worldwide, presents an unpredictable and often misunderstood challenge, with seizures occurring without warning and impacting every aspect of daily life. Early prediction of treatment outcomes is crucial for identifying patients with pharmacologically resistant epilepsy, prompting earlier alternative treatments for better results. Few studies have evaluated predictors of medical refractoriness in childhood epilepsy, one of which was conducted at the American University of Beirut Medical Center by Dana Ayoub and her associates. It followed 688 patients ranging from 6 months to 18 years of age, aiming to identify the prognostic variables for a two-year remission (2YR) following initiation of treatment with an antiseizure medication (ASM) in children and adolescents with new-onset seizures, solely based on the clinical characteristics. The aim of this study was to develop a model that can predict treatment outcomes based on variables obtained near the time of the initial evaluation.

Epilepsy diagnosis was based on clinical characteristics, initial EEG, and brain MRI findings. The work-up included a detailed history from the patient and an eyewitness, physical and neurological exams, a 3-hour sleep-deprived video-EEG interpreted by epileptologists, and an epilepsy protocol brain MRI interpreted by an experienced neuroradiologist. All patients were assessed for intellectual and developmental delay (IDD). Data collected at enrollment included demographics, disease characteristics, epilepsy risk, IDD (presence and severity), interictal epileptiform discharge (IED) types on initial EEG, and MRI results (epileptogenic lesion presence). The results showed that 79.7% of children with new onset seizures will achieve a two-year remission (2YR) after treatment initiation. Independent negative predictors of a 2YR include the presence and severity of IDD, an epileptogenic lesion on brain MRI, and the number of pretreatment seizures. It is the first study which clearly shows that the presence and severity of IDD is the most significant baseline variable influencing the probability of attaining 2YR. Moreover, children with normal development had the highest likelihood of achieving a 2YR, those with mild to moderate IDD had a lower probability, and those with severe IDD had the lowest. Consistent with previous studies, the presence of an epileptogenic lesion, highlighting the importance of obtaining an epilepsy protocol brain MRI, and a higher number of pretreatment seizures, were significant negative predictors for achieving a 2YR. However, the latter was only significant for children with focal-onset seizures, supporting the conclusion that the type of epilepsy is the major variable impacting outcome, rather than the number of pretreatment seizures.

Due to its prospective design, the wide range of examined variables, the inclusion of a large cohort of children and a long-term follow-up, the findings of this study are robust and reliable. The seizures and epilepsies were classified using the ILAE guidelines, ensuring a standardized and dependable classification system. This study not only confirmed the negative association between certain variables and the likelihood of a 2YR, but is also the first to conduct a recursive analysis to prioritize and differentiate these independent factors. However, several limitations need to be acknowledged. Infants under 6 months at initial presentation were excluded, perhaps leading to overestimating remission rates due to their higher prevalence of drug-resistant epilepsy. Additionally, some children were assessed with a 1.5 Tesla MRI, potentially underestimating epileptogenic lesions. Serum levels of newer ASMs were not routinely checked, and treatment adherence was based on caregiver reports. For children under 6, IDD severity was assessed using the Denver Developmental Screening Test without confirmation from other tools.

This study offers valuable insights into the prognosis of children with new-onset seizures. It shows that the likelihood of achieving a 2YR can be assessed during the initial evaluation, aiding in patient and family counseling. The findings help identify children who may need close follow-ups, early neurosurgical intervention or experimental treatments. There are still a lot of factors that need to be investigated, and future research should aim to validate and expand the predictive variables from this study and evaluate their applicability to diverse populations.

REFERENCES:

1. Ayoub D, Al-Hajje A, Salameh P, et al. Early predictors of remission in children and adolescents with new-onset epilepsy: A prospective study. *Seizure*. 2023;110:69-77. doi:10.1016/j.seizure.2023.06.007