

# Clinical and electroencephalographic characteristics of childhood epilepsy with centrotemporal spikes for antiseizure medications: monotherapy versus dualtherapy in a multicenter cohort study

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## INTRODUCTION

Childhood epilepsy with centrotemporal spikes (CECTS) is a childhood epilepsy with age-dependent and peculiar electroencephalographic (EEG) characteristics. This multicenter study aimed to define the clinical and electroencephalographic characteristics in children with CECTS in a national large cohort consisted of children with monotherapy or dualtherapy.

## OBJECTIVE

We studied clinical and electrographic characteristics of CECTS to identify potential prognostic factors and response to medication.

## MATERIAL AND METHOD

A total of 706 children with CECTS who were followed up at least three years with three EEG recordings in from six clinics across Turkey between 2010 and 2020 were included into the study. The study group were divided into three groups according to the first seizure occurrence age : (i) <5 years, (ii) 5-10 years, and (iii) >10 years. The predictive value of a neurophysiological EEG parameter (spike and wave index-SWI) was evaluated for the selection of antiseizure medication and for definition of ADHD. Receiver operating characteristic (ROC) curves were constructed to determine the predictive value of SWI for seizure outcome, differentiating antiseizure medications, and overall outcome in children with CECTS.

## RESULTS

Mean age was 8.18±3.35 (range, 3-15) years and the male-to-female ratio was 1.47:1. Patients that had their first seizure at the age of <5 years had more seizures than the other patients (22.1% vs. 12.8%) ( $p=0.003$ ). The valproic acid (VPA) group had the shortest time to the achievement of 50% reduction in seizures after monotherapy and the levetiracetam (LEV) group had the shortest time to the achievement of complete seizure control ( $p=0.013$ ). In the LEV group, 86.9% of the patients achieved seizure control with ASMs. LEV was superior to CBZ with regard to its effectiveness in controlling seizures and reducing the burden of interictal discharges, while VPA achieved the highest EEG response (60.8%)

Presence of bilateral EEG findings was the most important risk factor for dual therapy and patients that received dual therapy had frequent bilateral discharges and their SWI values were  $\geq 50\%$ . The ROC analysis performed to predict the choice of the initial drug, an SWI value of  $\geq 5.5$  in subsequent EEG recordings was considered to have a diagnostic value for the use of LEV as the initial drug (For baseline EEG; AUC: 0.616 [CI: 0.540-0.692]. LEV had the lowest SWI value (5.5) for the prediction of initial drug to be used in patients followed up for CECTS. The absence of ADHD findings in patients with decreased SWI values on subsequent EEG recordings was diagnostic.

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## CONCLUSION

This multicenter cohort study provide that the presence of bilateral EEG findings was the most important risk factor for indicating dual therapy. The decrease in SWI in subsequent EEG recordings in patients with ADHD shows the importance of drug use.

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