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# Evaluation of seizure treatment in anti-LGI1, anti-NMDAR, and anti-$GABA_BR$ encephalitis

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## Study objective and summary result

This study evaluated immunotherapies and antiepileptic drugs (AEDs) as treatments for seizures in patients with anti-leucine-rich glioma-inactivated protein 1 (LGI1) encephalitis, anti-NMDA receptor (NMDAR) encephalitis, or anti-γ-aminobutyric acid type B receptor ($GABA_BR$) encephalitis, and the chance to develop epilepsy after resolved encephalitis. It found that immunotherapies were more effective than AEDs for achieving seizure freedom, and the development of epilepsy was very uncommon subsequent to resolution of the encephalitis.

## What is known and what this paper adds

Patients with autoimmune encephalitis often seem unresponsive to AEDs but respond well to immunotherapies. This study clarifies the comparative efficacies of these 2 therapeutic options in patients with autoimmune encephalitis.

## Participants and setting

This study included 53 patients with anti-LGI1 encephalitis, 75 patients with anti-NMDAR encephalitis, and 25 patients with anti-$GABA_BR$ encephalitis who were treated at the Erasmus University Medical Center between August 1999 and May 2017. Of these 153 patients, 110 (46 LGI1, 43 NMDAR and 21 $GABA_BR$) were included because of new-onset seizures during their active disease courses.

## Design, size, and duration

This study collected clinical data, including disease course data and seizure histories, and treatment data through clinic visits, telephone interviews with patients or relatives, and medical records reviews. Seizure freedom was defined as the absence of observed seizures or self-reported focal or tonic-clonic seizures for ≥3 months.

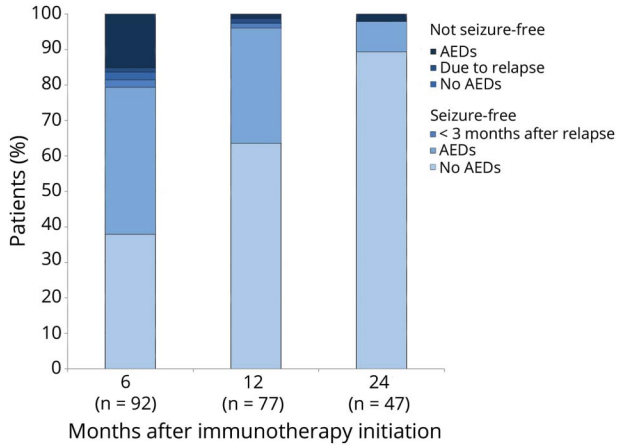
## Primary outcome measures

The primary outcomes were the efficacies of AEDs and immunotherapies in rendering patients seizure-free, and the likelihood of seizure onset after the resolved encephalitis.

## Main results and the role of chance

New-onset epileptic seizures with an immune origin were recorded for 110 patients, of whom 91% were treated with AEDs and 92% were treated with immunotherapies. Seizure freedom was achieved in 89% of these patients. Seizure freedom was more likely to occur shortly after immunotherapy than while using only AEDs (54% vs 15%, $p < 0.0001$), and the time from treatment initiation to seizure freedom was shorter for immunotherapies than for AEDs (29 vs 58 days, $p < 0.0001$, also significant for all 3 groups separately). Of the 86 surviving patients only one patient who had anti-LGI1 encephalitis (of the 39) developed epilepsy after resolved encephalitis.

**Figure** Evaluation of the patients that are at risk to develop epilepsy after resolved encephalitis at 6, 12 and 24 months after the initiation of immunotherapy




## Bias, confounding, and other reasons for caution

This study was conducted retrospectively, and treatment effects were not always accurately documented. The treatment regimens were heterogeneous.

## Generalizability to other populations

As the patient collection was nationwide, the results of this study seem to be generalizable.

## Study funding/potential competing interests

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