Antiepileptic drug treatment outcome

Careful antiepileptic drug selection for epileptic patients must be highlighted in order to improve outcome, reduce adverse drug reactions (ADRs) and improve patient compliance [1].

The goal in treating patients with epilepsy is a cost-effective approach to the elimination of seizures or a reduction in their number and frequency while avoiding drug interactions and side effects, so as to achieve the best possible quality of life. Among the desirable outcomes are an enhanced understanding of epilepsy by patients, caregivers, and society, and a lessening of the psychosocial risks of this disease. Patients fail to achieve their goals and outcomes when they fail to adhere to the drug regimen or when a less-than-adequate drug regimen is prescribed. To help improve adherence, once- or twice-daily formulations should be used. Working together, patients and clinicians can maximize the effectiveness of AED therapy and the potential for achieving desired goals and outcomes [2].

Despite the availability of many new AEDs with differing mechanisms of action, overall outcomes in newly diagnosed epilepsy have not improved. Most patients who attain control do so with the first or second AED. The probability of achieving seizure freedom diminishes substantially with each subsequent AED regimen tried. More than one-third of patients experience epilepsy that remains uncontrolled.

This was the conclusion of a longitudinal observational cohort study that was conducted at the Epilepsy Unit of the Western Infirmary in Glasgow, Scotland. A total of 1795 individuals who were newly treated for epilepsy with AEDs between July 1, 1982, and October 31, 2012, were included in this analysis. All patients were followed up for a minimum of 2 years (until October 31, 2014) or until death, whichever came sooner. Data analysis was completed between March 2015 and May 2016.

Seizure control was assessed at the end of the study period. Probability of achieving 1-year seizure freedom was estimated for each AED regimen prescribed. Multivariable models assessed the associations between risk factors and AED treatment outcome after adjustments were made for demographic and clinical characteristics.

Of the 1795 included patients, 964 (53.7%) were male; the median age was 33 years (range, 9-93 years). At the end of the study period, 1144 patients (63.7%) had been seizure free for the previous year or longer. Among those achieving 1-year seizure freedom, 993 (86.8%) were taking monotherapy and 1028 (89.9%) had achieved seizure control with the first or second AED regimens. Of the total patient pool, 906 (50.5%) remained seizure free for 1 year or longer with the initial AED. If this AED failed, the second and third regimens provided an additional 11.6% and 4.4% likelihoods of seizure freedom, respectively. Only 2.12% of patients attained optimal seizure control with subsequent AEDs. Epilepsy that was not successfully controlled with the first AED had 1.73 times greater odds of not responding to treatment for each subsequent medication regimen (odds ratio, 1.73; 95% CI, 1.56-1.91; $P < .001$). [3].

Machine learning approaches yielded predictions of successful drug treatment outcomes which in turn could reduce the burdens of drug trials and lead to substantial improvements in patient quality of life [4].

1)

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3)

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