

THERAPEUTIC DRUG MONITORING OF NEW-GENERATION ANTIEPILEPTICS IN PEDIATRIC PATIENTS: A FOCUS ON FACTORS INFLUENCING THE PLASMA CONCENTRATION

Ivana Damnjanović¹, Nikola Stefanović¹, Tatjana Tošić², Aleksandra Catić-Djordjević¹, Ana Kundalić¹, Slavoljub Živanović³, Radmila Veličković-Radovanović^{1,4}

Monitoring the concentrations of antiepileptic drugs (AEDs) in the pediatric population represents an important step in the vast variety of decisions related to the optimization of new-generation epilepsy therapy. The primary objective of this research was to determine the concentrations of lamotrigine (LTG) and levetiracetam (LEV) in the plasma of children and adolescents receiving combined antiepileptic therapy. Secondly, we examined the influence of demographic factors and co-therapy on the measured concentrations of AEDs. The prospective study included 71 subjects diagnosed with epilepsy, aged 2–18 years, receiving combined antiepileptic therapy, which included the following therapeutic regimens/modalities: valproic acid (VA)/LTG, VA/LEV and LTG/LEV. The results indicated that 86.27% of LTG concentrations and 68.97% of LEV concentrations were within the reference range. No statistically significant influence of co-medication on the concentrations of the tested AEDs was recorded. Additionally, the obtained results confirmed that LTG dose was the most significant predictor for LTG concentrations. The results of the conducted research indicated that only LEV dose corrected by body weight could potentially affect LEV concentrations. Although the therapeutic monitoring of new-generation AEDs is not commonly imposed in daily clinical practice, the results of the conducted research indicate that monitoring the concentrations of LTG and LEV can be of great benefit in the pediatric population receiving combined antiepileptic therapy due to the very nature of the disease and the potential pharmacokinetic variability of the investigated antiepileptics.

Acta Medica Medianae 2024;63(2): 5-14.

Key words: *pediatric population, therapeutic drug monitoring, lamotrigine, levetiracetam*