

SUMMARY

Introduction: Balance disorders and dizziness are some of the most common side effects of anti-seizure medications, as reported by treated patients. Pharmacotherapy for epilepsy can also involve visual disturbances, e.g. blurred vision, double vision, colour perception disturbances, and nystagmus. Depending on their severity, these dysfunctions can affect balance and provoke disturbances in postural control. The data available in the literature on balance disorders accompanying epilepsy treatment were mostly obtained from adult patient groups. In this study, we performed a composite analysis of balance parameters in paediatric patients with newly diagnosed epilepsy, before the inclusion of anti-seizure treatment, compared to a group of patients treated with medications.

Aim: The aim of the study was to evaluate the effects of epilepsy and anti-seizure therapy on the balance system in paediatric patients.

Material and methods: Study participants were recruited among patients at the Developmental Neurology and Epileptology Clinic at the ICZMP in Lodz. They were divided into two groups. The first group consisted of patients with a fresh diagnosis of epilepsy, with no abnormalities on neurological examination and no other concomitant chronic diseases, in whom balance assessment tests were performed before treatment inclusion (n=50). The second group included patients diagnosed with epilepsy, without abnormalities on neurological examination, in whom a balance assessment test was performed, after at least 3 months of continuous anti-seizure treatment. Patients were subjected to 3 tests: the Berg Balance Scale TUG (*Timed Up to Go*) test, a posturographic test.

Results: The tests conducted: the Berg Balance Scale and TUG showed that the risk of falling in both study groups was low. Furthermore, two posturographic parameters were evaluated in the analysis: statokinesiogram length (L) and percentage of time in the circle (R). The analysis showed that the L [mm] parameter has a significantly higher value ($p < 0.05$) in the treated group compared to the untreated group with eyes closed (OZ) in the anterior-posterior (AP) direction, and as the total distance travelled (2D). This indicates that the treated patient group is characterised by worse balance in this aspect. Data analysis showed that the R [%] parameter had a significantly higher value in the untreated group than in the treated group ($p < 0.05$) for both open eyes (OO) and closed eyes (OZ). This indicates that, compared to the group of treated patients, the untreated group has a better balance in this aspect.

Conclusions: There was no high risk of falls regardless of using anti-seizure treatment in the analysed epileptic patient study group. Detailed posturographic analysis identified worse

balance parameters in patients treated with anti-seizure medications compared to the untreated group. The characteristics of the balance disorders found in the anti-seizure patient group suggest the existence of complex abnormalities at various regulatory levels, only partially allowing for visual compensation.

