

The Role of Visual Evoked Potentials in the Early Diagnosis and Monitoring of Partial Optic Nerve Atrophy in Infants

Zulfiya Abdullayeva*, Zulfiya Nazirova, Difuza Turakulova

Department of Ophthalmology and Pediatric Ophthalmology, Tashkent State Medical University, Tashkent, Uzbekistan

Email address:

zulfiyayusufzoda@gmail.com (Zulfiya Abdullayeva), nazirova.zulfiya@bk.ru (Zulfiya Nazirova), dilya_ophtalm@mail.ru (Difuza Turakulova)

*Corresponding author

Abstract

Background. Partial optic nerve atrophy in infants remains a significant challenge in pediatric ophthalmology. Early diagnosis is complicated by the limited ability to subjectively assess visual function in young children. Therefore, objective diagnostic methods capable of evaluating the functional status of the visual pathway are of particular importance. Visual evoked potentials (VEPs) represent one of the most informative electrophysiological techniques for assessing impulse conduction along the visual pathway to the visual cortex. Among VEP parameters, the latency of the P100 component is considered the most sensitive indicator of functional impairment of the optic nerve. **Objective.** To evaluate the diagnostic value of visual evoked potentials in the early detection and longitudinal monitoring of infants with partial optic nerve atrophy. **Materials and Methods.** The study included 44 children aged 6 months to 2 years with ophthalmoscopically confirmed partial optic nerve atrophy. The diagnosis was established based on clinical examination and the presence of temporal pallor of the optic disc. All patients underwent flash visual evoked potential testing with assessment of P100 latency and response amplitude. Following the initial examination, all patients received a course of neurotropic therapy. The follow-up period ranged from 6 months to 3 years. **Results.** The mean P100 latency before treatment was 97.1 ms. Follow-up examinations demonstrated a tendency toward normalization of P100 latency in a proportion of patients. In contrast, VEP amplitude remained relatively stable throughout the observation period. Ophthalmoscopy consistently revealed varying degrees of temporal optic disc pallor in all patients. Statistical analysis was performed using descriptive statistical methods. Quantitative variables were expressed as mean (M) $\pm$ standard deviation (SD). The mean P100 latency was 97.12 ± 1.21 ms before treatment and 97.80 ± 1.67 ms after neurotropic therapy, corresponding to a mean change of 0.68 ms. These findings support the utility of VEPs as an objective tool for monitoring optic nerve function in young children with partial optic nerve atrophy. **Conclusion.** Visual evoked potential testing is an informative and objective method for assessing the functional integrity of the visual pathway in infants. The latency of the P100 component may serve as a sensitive biomarker for early functional changes associated with partial optic nerve atrophy and may be useful for monitoring the effectiveness of neurotropic therapy.

Keywords

Partial Optic Nerve Atrophy, Infants, Visual Evoked Potentials, P100 Latency, Pediatric Ophthalmology, Neurotropic Therapy