FEATURES OF VISUAL CHANGES IN CHILDREN WITH EPILEPSY

Abdullaeva D.R.
Tashkent Pediatric Medical Institute
https://doi.org/10.5281/zenodo.11390131

Abstract*. The incidence of epilepsy is 50-70 people per 100,000 population, the prevalence is 5-10 people per 1000 (Kwan P., Brodi M., 2000; Hauser W.A., 2015). In 70% of patients, it is possible to achieve remission or a decrease in the frequency of attacks (Gusev E.I., 2000; Brodi M., 2004).*
Keywords*: monozygotic twins, epileptogenesis, sciascopy, visometry, microdysgenesis*

The modern hypothesis of the etiopathogenesis of epilepsy assumes the multifactorial and polygenic nature of this disease, as well as the complex nature of the interaction of genetic predisposition to seizure activity with environmental factors [1,2,3,10,14].

The most interesting from a genetic point of view are idiopathic forms of epilepsy, which are an independent disease not associated with organic brain damage or other diseases. They are traditionally considered as cases with a high hereditary predisposition, as evidenced by the hereditary burden and high degree of concordance among monozygotic twins (65%) compared to heterozygous twins (12%) [Kjeldsen MJ. et al., 2003].

Numerous works devoted to epilepsy have noted that the development of an epileptic seizure is based on a paroxysmal dysfunction of a certain pool of neurons in the brain, and the mechanism of this condition is a violation of the electrogenesis of neurons, which consists in their spontaneous and synchronized charging and discharging [4,5,6, 12,13,15].

The morphological and biochemical disturbances that lead to explosive, synchronized neuronal activity have been the subject of study for many decades. There are also concepts of different levels of events occurring, referred to as “epileptogenesis”: cellular (including disturbances on the surface of cell membranes), the level of neural networks (transmitter or synaptic) and glial, i.e. cells surrounding neurons (including vascular cells) [6,7,9,10,11]. In Uzbekistan, problems of epileptology are more often dealt with by neurologists (children and adults) and psychiatrists, despite the fact that this is a multidisciplinary problem that also requires the attention of neurophysiologists, geneticists, biochemists, immunologists, and a wide range of doctors. When analyzing the literature data, we did not find any works concerning the study of the function of the visual organs in epilepsy. However, this issue is relevant in ophthalmology, because epilepsy is a common disease [5,6,12,13].

Purpose of the study: to study the clinical and functional features of visual impairment in children with certain forms of epilepsy. Materials and methods of research. The clinical study was conducted in the Department of Ophthalmology, TashPMI Clinic. The study is based on the results of examination and treatment of 151 patients (302 eyes) with epilepsy. The age of the observed patients varied from 4 months. up to 14 years (average age 6.8±1.2 years).

All patients had a carefully collected history of life and illness.

To assess concomitant somatic pathology, all children were examined by a pediatrician, neurologist, otolaryngologist and other specialists as necessary. Clinical, laboratory and instrumental research methods were carried out. The entire process of examining sick children

with epilepsy can be divided into the following research methods: visometry, determination of refraction by skiascopy in conditions of drug-induced cycloplegia, determination of the angle of strabismus according to Hirschberg, study of binocular vision, examination of the fundus (ophthalmoscopy), and also all patients with strabismus were carried out special research methods.

Research results. The criterion for including children in the study was the presence of epilepsy of various origins. The children were divided into two groups. Patients with epilepsy with pathology of the visual organ made up the main group of 103 (68.2%) and the control group consisted of 48 children with epilepsy without pathology of the visual organ (31.7%).

In 42 patients, a hypoxic factor of brain damage was identified, the vast majority in patients with epilepsy and visual impairment. Of the established etiological factors of the disease, the main role was played by: hypoxic-ischemic encephalopathy (n=41, 45.5%), abnormalities of brain development (n=17, 18.8%). According to an analysis of case histories in children of the neonatal period and early age suffering from epilepsy, perinatal pathology was identified in 66% of cases. Among the identified risk factors, hypoxic-ischemic encephalopathy predominated in 62.7% of cases. In the etiology of "non-idiopathic" focal epilepsies in young children, malformations of the brain (focal cortical dysplasia, microcephaly, heterotopia of gray matter) stood out in the first place. In our study, in patients with cryptogenic epilepsy and hypoxic factor in the perinatal period, the presence of microdysgenesis, which were not detected on computed tomography, could not be excluded. In some patients with diffuse brain damage (described as hypoxic-ischemic injury), daily seizures, and severe psychomotor retardation, metabolic disorders cannot be excluded.

More than half of the patients had daily or weekly attacks. In patients with daily attacks, their average number was 23.3 ± 17.1 per day. In all children with multiple attacks during the day, a pronounced vasospasm of the retinal vessels was detected in the fundus. The age of these patients was significantly younger ($p<0.02$) than that of patients with no seizures for more than 1 month.

65.8% of those with visual impairments were diagnosed with cerebral visual disorders. In these patients, disorders were identified in the form of convergent strabismus in -28.8%, divergent strabismus in 21.2% of children. The study identified children with strabismus from 1 to 5 years of age. Behavioral visual reactions in the form of absence or short-term fixation of gaze were detected in 16.1% of children. The syndrome of extended excavation of the optic nerve head (OND) during ophthalmoscopy in combination with damage in the periventricular region, occipital areas according to neuroimaging was combined with other changes in the posterior pole: displacement of the vascular bundle, tortuosity of vessels was found in 22.6% of the examined children. The duration of epilepsy in these children was more than five years. Extended optic disc excavation syndrome can mimic the picture of partial optic disc atrophy. In this connection, a thorough ophthalmological examination with possible digital photography of the fundus is necessary to correctly diagnose the form of visual disorders. To exclude optic nerve atrophy, these children underwent a study of visually evoked potentials. Optic nerve atrophy was 7.4% in children with a duration of epilepsy of more than 6 years. All patients with visual impairments had certain motor disorders. In 71.4% of cases, they were diagnosed with a severe degree of psychomotor development delay, and only one patient was diagnosed with a mild degree. The semiotics of sensory disorders was characterized by a lack of visual fixation and tracking, and auditory concentration.

In patients with visual impairments, frontal forms (31.4%) and epileptic encephalopathies (28.6%) predominated. Thus, the combination of motor and visual disorders were unfavorable

signs in the course of epilepsy: early onset of the disease, daily seizures, severe delay in psychomotor development.

According to the tasks set, we analyzed the structure of organ pathology depending on the duration of the disease and the number of epilepsy attacks in children. The pathology of the organ of vision depends on the duration of the disease, so with the duration of the disease in children under 1 year, the most common were strabismus, atrophy of the optic disc, nystagmus, and in children with a duration of the disease from 1 to 5 years: Strabismus and retinal angiopathy. In children with a disease duration of more than 5 years, retinal vascular angiopathy, myopia, astigmatism and hypoplasia were most often diagnosed. Also, optic disc atrophy was diagnosed only in children with a disease duration of more than 5 years.

REFERENCES

1. Gekht A.B. “Modern strategy for the treatment of epilepsy” // Journal. Pharmateka. 2002. - No. 1. - P. 15-21.
2. Torticollis A.A. Topographic mapping of visual evoked potentials in the diagnosis of diseases of the visual system//Vestn. ophthalmol. - 2001. - No. 3. — P. 50-54.
3. Lokshina O.B. Functional state of the visual analyzer system in patients with epilepsy: PhD thesis. honey. Sci. - M., 2000. - P.112-113.
4. Brecelj J. From immature to mature pattern ERG and VEP//Doc. Ophthalmol. 2003. - Vol. 107, N 3. - P. 215-234.
5. Shorvon, S. Handbook of Epilepsy Treatment: Shorvon/Handbook of Epilepsy Treatment / S. Shorvon // Progress in Neurology and Psychiatry. - 2010. - Vol. 15, No. 1. - P. 4.
6. 10. Genetic features of valproate metabolism as a risk factor for the development of adverse drug events / D.V. Dmitrenko,
7. H.A. Schneider, Yu.B. Govorina [and others] // Modern problems of science and education. - 2015. - No. 5. - P. 237-237.
8. Guzeva, V.I. Features of modern treatment of epilepsy in children / V.I. Guzeva, V.V. Guzeva, O.V. Guzeva // Epilepsy and paroxysmal conditions. - 2016. - T. 6, No. 4. - P. 83-84
9. Avakyan, G.N. Resolution of the meeting of the working group of the Russian Antiepileptic League / G.N. Avakyan, E.D. Belousova, S.G. Burd et al. // Epilepsy and paroxysmal conditions. - 2016. - No. 4 (8). - P. 109-111.
10. Melikyan, E.G. Characteristics and possibilities of using questionnaires to study the quality of life of patients with childhood epilepsy / E.G. Melikyan // Bulletin of the International Center for Quality of Life Research. - 2010. - No. 15-16. - pp. 97-107
11. Nazirova Z.R., Turakulova D.M., Yuldosheva F. ANALYSIS OF THE CAUSES OF INSUFFICIENCY OF CAPSULE SUPPORT OF THE LENS IN CHILDREN AND THEIR SURGICAL TREATMENT //Advanced Ophthalmology. – 2023. – T. 1. – No. 1. – pp. 136-138.
12. Nazirova Z.R., Turakulova D.M., Buzrukov B.T. Analysis of the results of examination and treatment of children with congenital glaucoma //Modern technologies in ophthalmology. – 2020. – No. 3. – pp. 124-125.
13. Nazirova Z.R., Buzrukov B.T., Khodzhimetov A.A. Features of the local inflammatory process and immune response in children with allergic eye diseases // Russian Ophthalmological Journal. – 2014. – T. 7. – No. 1. – pp. 24-27.

14. Englot, D.J. Consciousness and epilepsy: why are complex-partial seizures complex? /D.J. Englot, H. Blumenfeld // Prog brain res. - 2009. - Vol. 177. - P. 147170.
15. Fisher, R.S. ILAE Official Report: A practical clinical definition of epilepsy / R.S. Fisher, C. Acevedo, A. Arzimanoglou et al. // Epilepsy. - 2014. - Vol. 55(4). - P. 475-482.