Ophthalmological and Clinical and Biochemical Characteristics of Patients with Essential Arterial Hypertension

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ABSTRACT

It is known that ONH drusen are diagnosed in 4% of cases in healthy adults and represent deposits of chondroitin sulfates prone to progressive calcification with age [110, 111, 131, 138,214]. As a rule, they are found in both eyes, but at the same time they are located asymmetrically [14]. They occur equally often in both men and women and can often potentiate such serious complications as: peripapillary hemorrhages (including massive ones), peripapillary subretinal neovascular membranes, intraretinal extravasation of blood plasma, damage to the pigment epithelium in the macula and papillomacular bundle [10] . At the same time, information about the presence of optic disc drusen and their complications in children, according to the literature, is isolated [1].

The aim of the work is to determine the characteristics of ONH drusen and their influence on changes in visual functions in children and adolescents with EAH, as well as to identify the relationship between changes in somatic health and the presence of OND drusen.

Keywords:

To do this, a comparative analysis of the results of all studies in three groups was carried out:
Control group (n=18).
Patients with EAH and OND drusen (n=42).
Patients with EAH without optic disc drusen (n=8).
When analyzing the results obtained, it was found that in children and adolescents with EAH with optic disc drusen, as well as without drusen, there was a significant decrease in the amplitude of the pattern-VEP to a large and small stimulus (by 25.4 and 36.5%, respectively) , the amplitudes of the ERG pattern of the P50 and N95 components (by 31.4 and 24.7%, respectively), which indicates the involvement of the central avascular parts of the retina in the pathological process. A decrease in the amplitude of oscillatory potentials by 30-60% compared with the control indicates severe ischemia of the inner layers of the retina in all patients with EAH.
As can be seen, the difference in retinal electrogenesis in patients with and without drusen was obtained by registering Ganzfeld-ERG for a single flash; compared with similar indicators in children without drusen, which is an indicator of the function of photoreceptors, depolarizing and hyperpolarizing bipolar cells and Muller cells. Similarly, the amplitude of the rhythmic ERG at 30 Hz decreased by an

average of 40%, reflecting the functional depression of cone photoreceptors [4].

In our opinion, an important result presented in Table 12 is an almost threefold decrease in the amplitude of the P4 wave with its pronounced deformation. These changes were found in all patients with OD drusen, which allowed us to consider this indicator of the electrophysiological study as a pathognomonic sign of OD drusen. Taking into account the fact that P4 depression of the OP characterizes ischemia in the proximal retina, it can be assumed that the presence of drusen, apparently, exacerbates these changes (Fig. 22) [4].

Located in the layer of nerve fibers, drusen cause an increase in the volume of the optic nerve head, which, according to OCT data (Table 13), is recorded as an increase in the thickness of the layer of nerve fibers in various segments from 234.88 to 267.25 μm compared with similar parameters in patients without druse 164.88 and 210.75 μm, respectively ($p<0.05$). When analyzing the tomograms, a large scatter of indicators was revealed, which is explained by the different localization and depth of the drusen.

Comparative analysis of the results of color flow analysis of orbital vessels did not reveal significant differences in the two compared clinical groups - with and without drusen (Table 14). In patients both with and without optic nerve drusen, an increase in the resistance index and pulse index in the central retinal artery, reflecting the state of the retinal blood supply, was revealed against the background of an adaptive increase in speed indicators.

In the posterior short ciliary arteries, representing the choroid itself, there was a decrease in diastolic blood flow velocity against the background of an increase in the pulse index and resistance index compared to the norm.

Differences in the two compared groups (children and adolescents with EAH with and without optic disc drusen) were noted only in terms of the level of systolic blood flow velocity in the ophthalmic artery, which was lower in individuals with drusen, but at the same time exceeded the values of the control group.

Computer perimetry, which makes it possible to evaluate the light sensitivity of the retina both at each separately studied point located at a distance of 6 degrees from the other, and which makes it possible to compare the calculated coefficients and deviations from the average age parameters, showed that patients of the two clinical groups had differences in terms of MS - average light sensitivity of the retina. From the material presented above, it becomes obvious that, in general, drusen of the optic nerve head, detected in patients of childhood and adolescence with EAH, do not significantly aggravate changes in the visual system caused by arterial hypertension, but in some cases they cause a decrease in light and electrical sensitivity of the retina, according to - apparently, due to the compression effect of drusen on the glial tissue and thereby aggravation of ischemic disorders. Obviously, the regression equations in the comparison groups are fundamentally different.

In patients of the first group (with OD drusen), changes in the level of P4 are consistent with changes in biochemical parameters, such as glucose, magnesium and LDL, as well as the level of diastolic pressure. The combination of these signs indicates the influence of the general somatic state and the level of blood pressure on the change in oscillatory potentials, in particular the P4 wave, reflecting the presence of ischemic processes in the retina.

When analyzing the regression equation for patients of the second group (without optic disc drusen), it was found that changes in the P4 amplitude are consistent with the level of low and very low density lipoproteins, a decrease in the concentration of which compared to HDL, as mentioned above, and can determine the resistance of the vascular wall to damage. and the formation of hyaline droplet dystrophy.

Thus, as a result of the study of children and adolescents with EAH with OD drusen and without OD drusen, it was found that one of the leading mechanisms for the formation of drusen are profound metabolic changes, primarily related to the lipid profile, as well as

glucose. In addition, the level of diastolic blood pressure has a significant impact on their formation.

Undoubtedly, further research in this direction is required to better understand the mechanism of formation of optic disc drusen and their influence on visual functions.

Literature

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