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DISEASE PREVALENCE AND TREATMENT METHODS OF BRIMONIDINE LOWERING CONCENTRATION AS A NEW SOLUTION IN THERAPY IN GLAUCOMA PATIENTS

Ikramov A.F

Andijan State Medical Institute professor, Ph.D

Makhkamov A.O

Graduate student of Andijan State Medical Institute

Abstract. The article provides information on the prevalence and treatment methods of diseases of decreasing brimonidine concentration as a new solution in the therapy of patients with glaucoma, using the scientific results of scientific research. The article is based on a study of articles related to the topic.

Key words: glaucoma, brimonidine, ophthalmology, pathological process, microvascularization, erythropoiesis, inflammatory process, ophthalmotonus, hemoglobin, intraocular pressure.

INTRODUCTION

Glaucoma is a chronic neurodegenerative disease that results in irreversible blindness [1]. The main and only modifiable risk factor for the development and progression of glaucoma is increased intraocular pressure (IOP) [2]. Methods to reduce the level of ophthalmotonus include drugs, laser, and surgical treatment. The goal of glaucoma therapy is to achieve the target values of ophthalmotonus, in which the deterioration of visual functions slows down or stops [3]. The "gold standard" for assessing the state of visual functions is static perimetry. This study allows for the first detection of glaucoma and dynamic evaluation of the effectiveness of therapy in cases of already advanced disease [4]. Evaluation of structural changes of the optic nerve and retina plays an important role in the correct diagnosis of glaucoma. Comparison of the results of optical coherence tomography (OCT) and static perimetry allows to evaluate structural functional correlations.

Stability of structural and functional changes in dynamics is an indicator of achieving the target values of ophthalmotonus.

According to clinical guidelines for glaucoma therapy, treatment should be started with initial monotherapy. The first choice means, as a rule, are drugs of the group of prostaglandin analogues [5]. In the absence of sufficient antihypertensive effect, it is necessary to strengthen the drug regimen and add new drugs. According to the concept of "reasonable maximum" in glaucoma therapy, three drugs can be given at the same time. If there is no effect of local therapy, it is necessary to switch to surgical treatment of glaucoma. In cases where the use of drugs from the group of prostaglandin analogues is limited, brimonidine is the most reasonable choice as initial therapy. It is the only molecule that

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reduces the production of intraocular fluid and enhances the uveoscleral outflow. An additional effect is shown when brimonidine is added to the combined therapy of glaucoma, which allows to further reduce the degree of ophthalmotonus. The use of brimonidine as a drug of first choice is justified. Brimonidine has also been described to have a direct neuroprotective effect by reducing glutamate excitotoxicity on retinal ganglion cells [5]. the use of several antihypertensive agents can cause obvious changes in the tissues of the anterior segment of the eye.

RESEARCH MATERIALS AND METHODOLOGY

Each patient underwent a physical examination based on clinical signs, taking into account the patient's symptoms and objective condition.

As an additional method, general analyzes of patients received for examination from the laboratory department of the ADTI clinic were also considered: blood (hemoglobin level, erythrocyte and leukocyte count, hematocrit determination, reticulum, color index calculation), blood of ABO and Rh systems groups were determined by standard methods, biochemical methods were used to determine the amount of iron in blood serum.

RESEARCH RESULTS

Adjunctive therapy using brimonide-0.2% contributed to a gradual decrease in the level of KIBO in patients of groups III and IV, while ophthalmotonus remained stable in groups I and II. So after 6 months. In group III patients who received the combination of Aph, bb and brimonidine, the level of KIBO decreased from 15.3±4.1 mm HG. 14.4±3.7 mm Hg (by 5.9%), and by the end of the study, it decreased to 12.8±3.5 mm Hg. (which was 16.3%). Ophthalmotonus ophthalmotonus changed from 15.2±4.3 mm HG in group i patients treated with Aph and bb. 14.7±4 mm Hg in the first 6 months (by 3.3%). observations and remained at the same level after 1 year — 14.7±3.9 mm Hg column.

Brimonidine was well tolerated by patients during the study. Adverse events have not been reported in the interaction of brimonidine with other antihypertensive drugs and their combinations (latanoprost + timolol, dorzolamide + timolol).

The efforts of ophthalmologists are aimed at reducing the level of KIBO in order to prevent the development of glaucomatous optic neuropathy. However, catastrophic visual changes and retinal ganglion cell death (RGH) continue to occur even when KIBO levels are well controlled. It is very important to develop additional treatment strategies aimed at maintaining the functional activity of the retinal and optic nerve.

There is great interest in the use of drugs with neuroprotective effects. High levels of KIBO are known to activate apoptosis and promote RGH death. In the advanced stage, drugs with different mechanisms of antihypertensive action are used to reduce KIBO. Their combination has the most obvious additional effect. Alpha-2-adrenomimetics (for example, brimonidine 0.2%) are widely used in the treatment of glaucoma, both in fixed and separate combinations.

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The neuroprotective effect of brimonidine has been studied in experimental and clinical studies. It has been proven that the drug prevents the loss of gcs and the thinning of the inner layer of the retina. The authors report that brimonidine inhibits nerve growth factor, brain-derived neurotrophic factor, and fibroblast the main growth factor stimulates production. Studies have shown that, according to static perimetry data, brimonidine preserves the visual fields of patients and reduces the rate of development of the glaucoma process. According to the authors, the neuroprotective effect is independent of its antihypertensive efficacy. It is necessary to evaluate the feasibility of using brimonidine 0.2% in the additional therapy of patients with advanced stage of glaucoma.

Since there are almost no studies on the effectiveness of adding brimonidine as a 4th drug to mmt, the aim of our study is to reduce KIBO by 0.2% by brimonidine to achieve the target pressure in the augmentation of the maximum regimen of antihypertensive therapy for primary open glaucoma (GL) with brimonidine. assessment of additional effects

Inclusion criteria: advanced GL stage; subcompensation of KIBO on the background of hypotensive therapy with prostaglandin analogues, as well as the prescribed combination of a carbonic anhydrase inhibitor and a beta-blocker; age included in the study — from 45 to 89 years; place of residence — Chelyabinsk; Clinical refraction within ±3.0 dptr and astigmatism ±1.5 dptr; The thickness of the cornea in the central zone is not taken into account.

Exclusion criteria: any other form of glaucoma; opacification of the optical environment, which prevents the implementation of perimetric studies using standard automatic perimetry; other retinal diseases (age-related maculodystrophy, conditions after retinal vascular occlusion, diabetic retinopathy and its complications; history of complications of surgical treatment of ophthalmopathy; damage and diseases of the organ of vision and its paranasal apparatus; other general diseases requiring hormone therapy.

A comparative analysis of ophthalmotonus indicators during follow-up clearly reflects similar dynamics according to the data of the used KIBO measurement methods (Fig. 1). Target KIBO levels were achieved with comparable performance in both groups. However, intergroup differences were found in the final percentage of reduction of ophthalmotonus: in group 1, the KIBO decrease according to the data averaged for all Tonometers was 5.4% (-7.1%; 17.6%), and in 2— 20.7% (4.4%; 30.7%) ($p<0.05$). Only iCare tonometer differences were more pronounced than iCare, with 8.3% (-11.8%; 28.6%) for the conservative treatment group and 33.3% (13.9%; 50.7%) for the surgical treatment group. formed 1 month later in group 1. use of brimonidine reduced mean p016.1±5.0 to 13.8±5.7 mm HG. , i.e. 14.3%, which is a good result for the 4th antihypertensive drug.

To date, a number of studies have been conducted to evaluate the antihypertensive efficacy of brimonidine 0.2%.

In our study, the mean values of KIBO measured with a Maklakov tonometer (10 g) were at least 20.5 (18.5; 23.6) mm Hg. When measuring KIBO with the iCare tonometer, iCare averaged 13.0 (11.0; 18.5). A smaller difference in the dynamics of ophthalmotonus in the postoperative period, according to the data of elastotonometry, may be related to the limitation of Maklakov's tonometry method, which is expressed by the

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detection of ophthalmotonus less than 20 mm HG. in a large number of patients, this method is not possible (this can be seen in the example of multicenter studies). Thus, according to many studies of the "scientific avant-garde" group, in clinical practice, the average level of ophthalmotonus according to Maklakov tonometry (10g) is less than 20 mm HG. In the advanced stage of glaucoma, the use of brimonidine in additional therapy leads to a persistent hypotensive effect. Combination therapy with brimonidine helps to preserve the visual functions of patients with GL even in the advanced stages of the disease. In our study, the neuroprotective efficacy of brimonidine is confirmed by the results of static automatic perimetry and the dynamics of MD parameter values for different groups of patients. The results of the study show that brimonidine can be used as a neuroprotector in the complex treatment of patients with an advanced stage of glaucoma, having a hypotensive and neuroprotective purpose.

CONCLUSION

1. In the initial stage of primary open-angle glaucoma, the fixed combination of brimonidine/brinzolamide in "naïve" patients after 6 months of treatment increased the average KIBO level by 32.77% compared to the original patient, when therapy with analogs of prostaglandins and beta-blockers was carried out - by 33.69% provides effective reduction to

2. The appointment of a fixed combination of brimonidine tartrate and brinzolamide normalizes KIBO in patients who are resistant to the appointment of beta-blockers and prostaglandin analogues.

3. The use of antihypertensive therapy as a new fixed combination of brimonidine tartrate and brinzolamide is part of a neuroprotective strategy in the treatment of patients with primary open-angle glaucoma.

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