

### The results of surgical treatment of ocular ischemic syndrome in patients with congenital and acquired pathological tortuosity of the carotid artery.

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#### INTRODUCTION

Pathological tortuosity of the internal carotid artery (ICA) is one of the most common causes of cerebral circulatory disorders, as well as leading to ischemia of the visual organ in 10-16%. The prevalence of PI ICA among the adult population, according to the results of angiographic and pathomorphological studies, ranges from 10 to 40% .

According to etiology, there are congenital PI ICA and acquired PI ICA. The congenital causes of PI ICA include genetically determined diseases such as Marfan syndrome, Turner syndrome, hemochromatosis, fibromuscular dysplasia, and others. Diseases such as atherosclerosis, hypertension, aortoarteritis, and others lead to acquired PI ICA

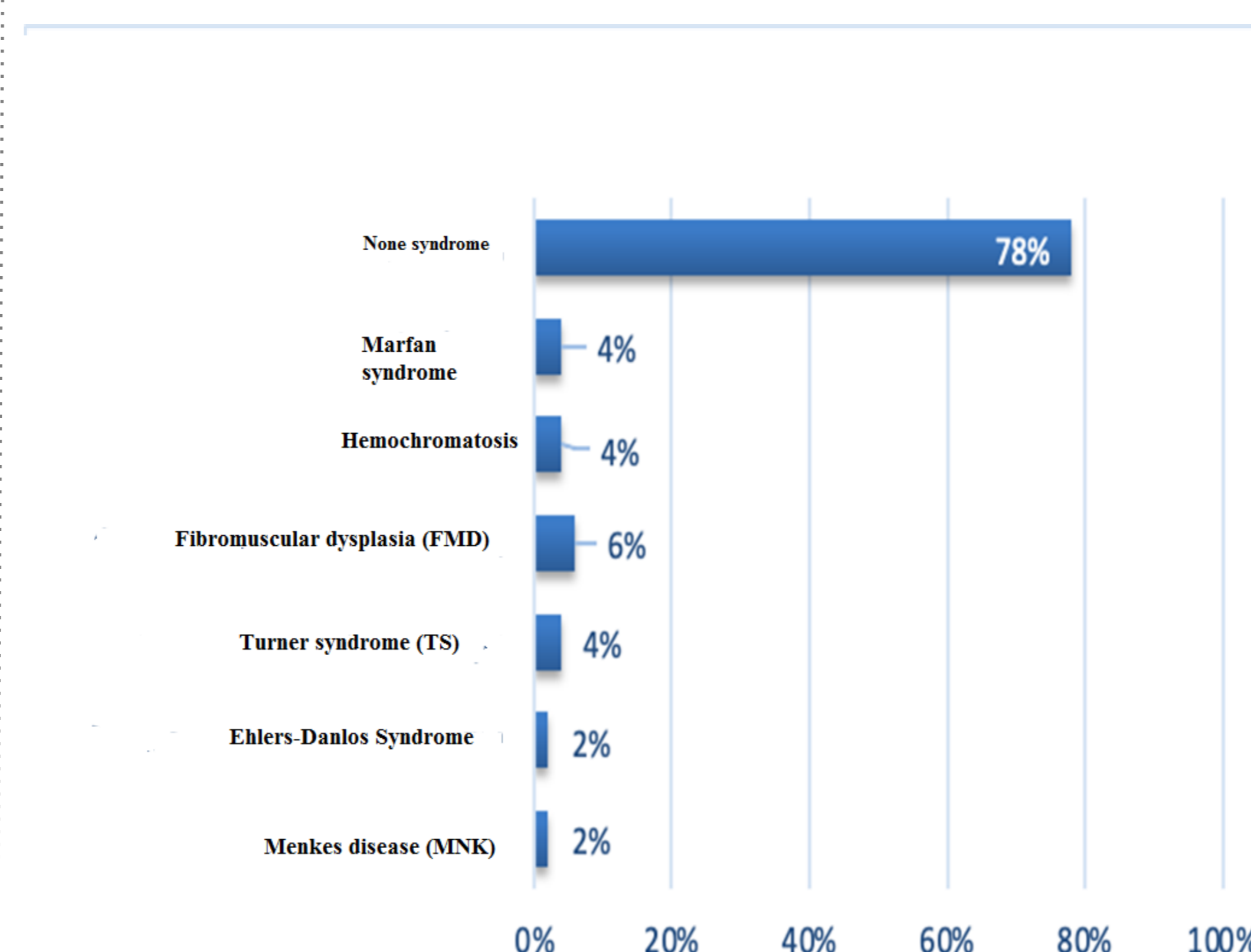
#### AIM

To evidence that surgical treatment of ocular ischemic syndrome (OIS) in patients with congenital and acquired pathological internal carotid artery tortuosity (PT ICA) is more effective than conservative treatment.

#### METHODS

A single-center prospective cohort comparative study included 50 patients with PT ICA and OIS and divided into II groups: group I (N=25) after surgical treatment, group II (N=25) after conservative treatment. All patients included in the study underwent a genetic examination, according to the results of which, group 1 was divided into subgroups: IA - with congenital PT ICA (n = 11) and IB - with acquired PT ICA (n=14). All patients were examined by an ophthalmologist, neurologist, vascular surgeon before and a year after treatment. .

FIG1. Spectrum of congenital pathology with identified genetic disorders



#### RESULTS

In the IA subgroup after surgery, Vs (ICA) = 83.9±3.9 cm/s and IR = 0.63±0.04 (p<0.05) were significantly better than baseline values. In subgroup IB, there was an improvement in Vs and IR indicators in all the studied vessels compared with the initial indicators (p <0.05). Hemodynamic parameters in subgroup IB were significantly better than in subgroup IA and group II (p<0.05). In group II, the deterioration of Vs (ICA) =180.5± 2.1 cm/s, Vs (OA) = 24.4 ±0.8 cm/s and Vs (CRA) = 8.6 ±0.49 cm/s, compared to before the start of treatment (p<0.05). In subgroup IB, visual acuity was better than in subgroup IB and group II. (p <0.05). When assessing the degree of chronic cerebrovascular insufficiency, a year later, the best result was observed in patients in subgroup IB (p<0.05).

Fig. 3. Dynamics of the degree of CCI after treatment

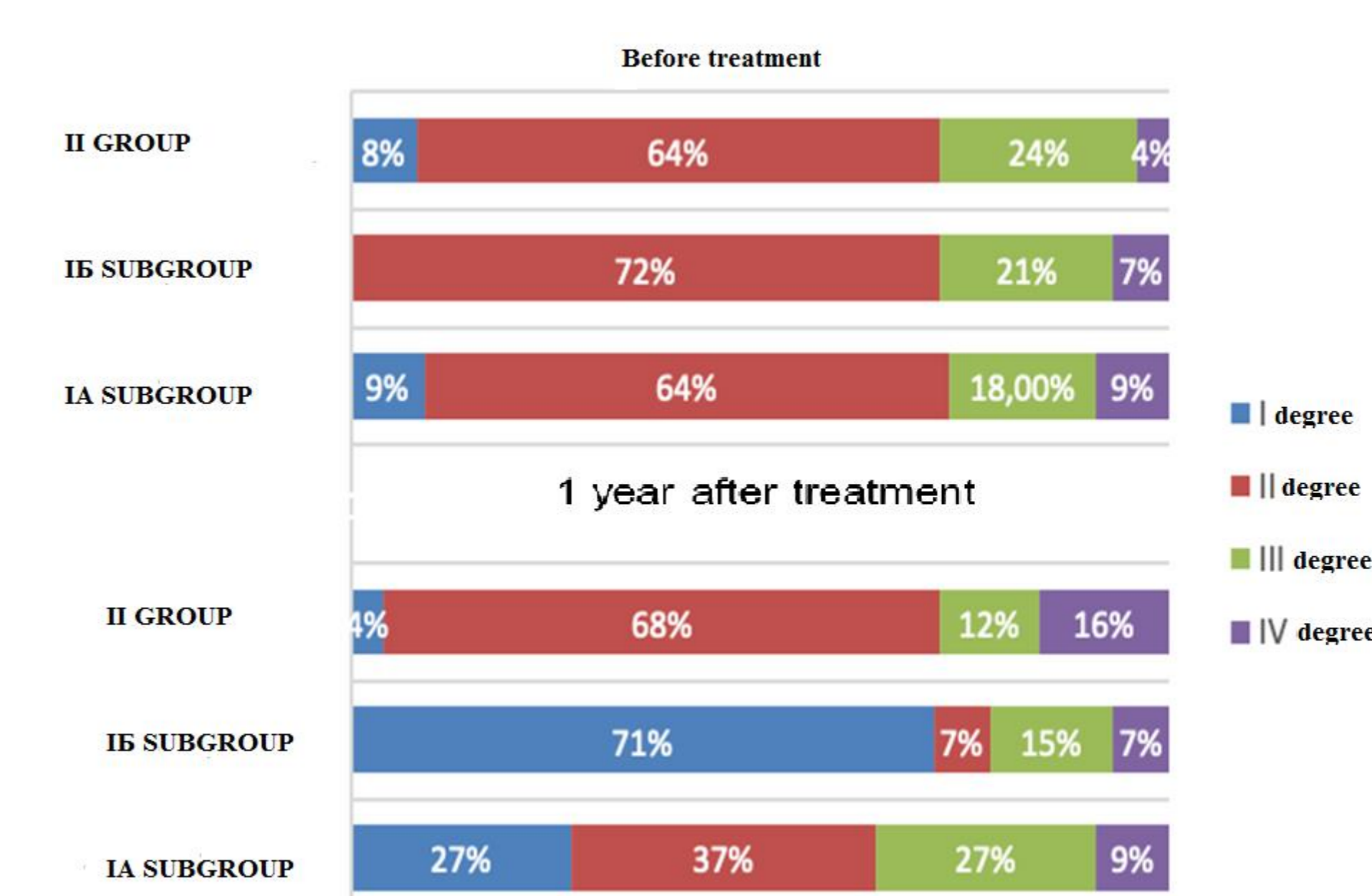


Fig.4. Dynamics of visual acuity in patients with PI ICA

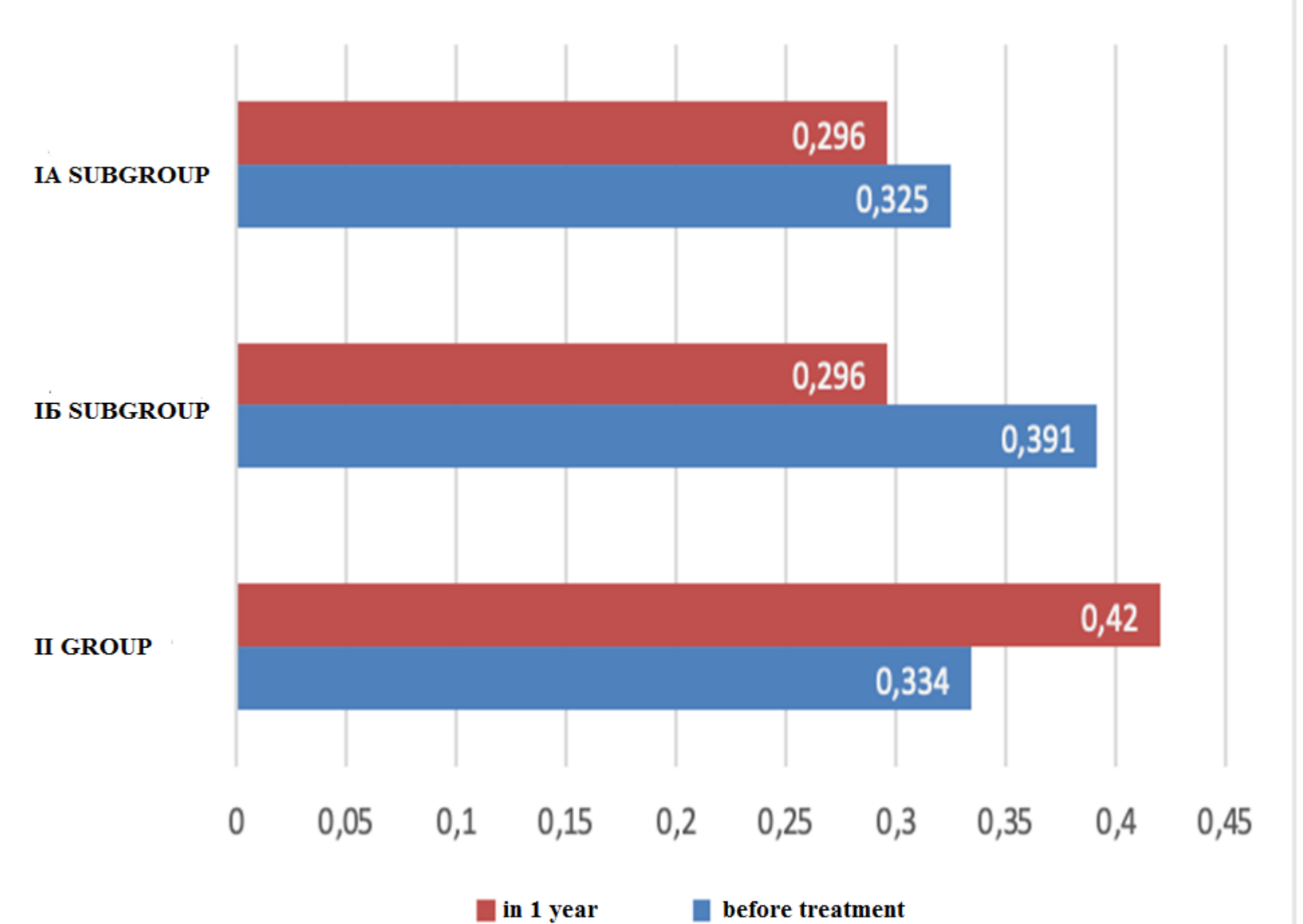


Table 1. Dynamics of blood flow in ICA and ocular vessels in patients with PI ICA

Artery	Blood flow parameters			
	Before treatment		1 year after treatment	
	Vs, cm/c	IR	Vs, cm/c	IR
<b>IA subgroup</b>				
ICA	179,7±7,4	0,69±0,05	83,9±3,9 °≈	0,63±0,04 °
Ocular artery	26,8±1,8	0,69±0,1	27,3±1,2	0,71±0,03
Central retinal artery	10,3±0,6	0,83±0,01	11,0±0,4	0,84±0,02
Posterior short ciliary artery	9,6±0,5	0,80±0,02	10,4±0,2	0,79±0,01
<b>IB subgroup</b>				
ICA	180,1±7,7	0,79±0,1	85,7±3,9 ~*	0,63±0,05 ~*
Ocular artery	22,9±0,9	0,84±0,01	38,0±0,5 ~*	0,69±0,006 ~*
Central retinal artery	8,3±0,3	0,88±0,09	12,9±0,01 ~*	0,69±0,02 ~*
Posterior short ciliary artery	7,8±0,41	0,79±0,06	13,6±0,2 ~*	0,66±0,02 ~*
<b>II group</b>				
ICA	173,4±2,6	0,75±0,03	180,5±2,1 °≈	0,76±0,03
Ocular artery	27,4±0,9	0,82±0,01	24,4±0,8 °	0,84±0,01
Central retinal artery	10,3±0,6	0,81±0,03	8,6±0,49 °	0,84±0,001
Posterior short ciliary artery	9,1±0,4	0,80±0,01	8,8±0,1	0,79±0,02

\*-reliability index of group IB for entertainment to group II p <0,05  
~ -reliability index of group IB in relation to group IA p <0,05  
≈ -reliability index of group IA in relation to group II p <0,05  
°-p<0,05 – significantly relative to the “before treatment” group

#### CONCLUSIONS

Conservative treatment does not contribute to reducing the degree of CCCI and OIS in patients with PT ICA. PT ICA resection is a safe and effective treatment method. It is necessary to study genetic predictors when setting indications for surgical treatment in patients with congenital PT ICA.

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