THE NEW ARMENIAN MEDICAL JOURNAL
Vol.4 (2010), N 2, p. 34-36

TREATMENT OF PATIENTS WITH AVASTIN AS THE MAIN COMPONENT IN COMPLEX REHABILITATION OF THOSE DEVELOPING AGE-RELATED MACULAR DEGENERATION

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Abstract

Anti-vascular endothelial growth factor can be considered a comparatively efficient medical therapy and can be applied in combination with laser coagulation and photodynamic therapy. Tracing the dynamics of visual acuity variations after intravitreal injection of avastin gradual improvement in vision of patients with neovascular form of age-related macular degeneration (AMD) was observed with peak in the end of the first month post-injection. In treatment of patients with neovascular form of AMD inhibitor endothelial vascular factor of growth avastin is an effective medicine for treatment of this serious disease. Each returned line of AMD-affected patients' visual acuity is the indicator of their life quality improvement.

Keywords: *age-related macular degeneration, avastin (bevacizumab), quality of life.*

INTRODUCTION

Age-related macular degeneration (AMD) is one of the reasons of blindness at the age of 50 and above. At this age the probability of developing AMD makes 2%, while at the age of 75 the risk increases to 30%.

Considering the structure of primary physical disability due to AMD, patients at working-age make 21% and those on a pension: 32% [*Limban E., Shakhova E., 2003*].

As the reason of poor-sightedness, AMD has the third place in the structure of eye pathologies after glaucoma and diabetic retinopathy if considered the economically developed countries of the world [*Klein R. et al., 2001*].

Sociomedical importance of AMD is stipulated by the following features of the disease: its localization and the two-sidedness of the process identified in 60% of cases. AMD causes the restriction and further disability of functioning at short distance and abrupt reduction of a patient's quality of life (QL).

During the last years considerable growth of interest was observed to the concept of "quality of life" amongst the medical community members of different aspects including ophthalmologists.

The research on QL in ophthalmology is mostly dedicated to patients developing cataract, glaucoma and age-related degeneration of retina [*Brown G. et al., 2000; McClure M. et al., 2000*].

The research resulted in the following: as two-sidedness, asymmetry and central localization of pathologic processes in retina are characteristic features of AMD, the QL of patients developing macular degeneration is worsening due to difficulties arising not only in writing and reading but also driving, telecast watching and working on computer [*Hazel C. et al., 2000*; *Limban E., Shakhova E.*, 2003].

AIM

The therapeutic methods of treatment applied in

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Table.

Dynamics of variations of visual acuity after single intravitreal injection of avastin (IVA) to patients with neovascular form of AMD

Visual acuity	Number of eyes after IVA	Percentage ratio before IVA	Number of eyes in a week post-injection	Percentage ratio in a week after IVA	Number of eyes in a month after IVA	Percentage ratio in a month after IVA
0.01-0.03	10	13.4%	8	10.6%	8	10.6%
0.04-0.06	36	48%	37	49.2%	34	45.4%
0.07-0.09	21	28%	22	29.4%	23	30.6%
0.1-0.3	6	8%	4	5.4%	6	8%
0.4-0.7	2	2.6%	4	5.4%	4	5.4%
Total	**75**	**100%**	**75**	**100%**	**75**	**100%**

AMD have been considerably developed during the last years. However, there are no satisfactory ones for the prevention of vision loss in the majority of AMD-affected patients.

At present vascular endothelial growth factor (VEGF) inhibitor therapy is considered to be the principle one for treatment of AMD after studying the results of its application.

Anti-VEGF therapy can be considered as a certain medical therapy and can be applied in combination with laser coagulation and photodynamic therapy (PDT).

Food additives rich in antioxidants, beta-carotenoids, zinc, and copper should be taken between the courses of treatment with VEGF inhibitors.

MATERIAL AND METHODS

Avastin (bevacizumab) is an antibody for all VEGF isoforms. Since 2004 it is widely used in oncology for treatment of cancer of intestine.

In 2005 American researchers R.J. Rosenfield and C.A. Puliafitio announced the trial of avastin application in patients affected an exudative form of AMD. For a period of time the efficiency of intravitreal injection of avastin (IVA) was doubted for its greater molecular weight and therefore incapability of penetrating through the retina. However, the results of further published research [*Imrie F., Bailey C.*, 2007; *Dadgostar H., Waheed N.*, 2008] do testify that avastin injected into a vitreous body is capable of penetrating through all the layers of retina.

IVA with a short needle is done on the area of *pars plana* (3.5-4 *mm* to the limb) through sclera after the topical instillation anaesthesia. Avastin is administered into vitreous body at the dose level of 0.05 *ml* (1.25 *mg*).

Single IVA to 60 AMD-affected patients (75 eyes) were performed.

RESULTS AND DISCUSSION

As obvious from the Table, no case of visual acuity decrease was observed in patients with AMD after IVA. Moreover, we see that after a single IVA in the first two groups with low visual acuity the number ratio of eyes has decreased owing to improvement in vision and transition into groups with higher visual acuity. In groups with rather high visual acuity (from 0.07 to 0.3) the number ratio of eyes was increased. The optimal effect was displayed in eyes with vision from 0.4 to 0.7, while variations of retina could still be reversible. The number ratio of eyes in this group increased two times. Tracing the dynamics of visual acuity variations after IVA gradual improvement in vision was noted in patients with neovascular AMD with peak in the end of the first month post-injection.

Optical coherent tomography was done in three patients from the two first groups (vision acuity from 0.01 to 0.06) before the injection of avastin and in a month post-injection.

On average, the initial thickness of the retina foveal zone before injection of the medicine equaled 497 *mcm* and to the end of the month after IVA the mean thickness of retina was 365 *mcm*.

After the intravitreal injection of avastin the following complications of general character were observed: slight vertigo and increase of arterial pressure in 27 (45%) patients.

The arterial pressure of patients decreased when the age-related norm was exceeded, in the rest of the cases hypertension passed itself a few hours or days later.

After IVA the following complications of eyes were displayed:

1. Conjunctiva hemorrhages: 23 (30.7%) eyes;
2. Increase of intraocular pressure (IIP): 12 (16.0%) eyes;
3. Detachment of the posterior hyaloid membrane (PHM) of vitreous body: 5 (6.7%) eyes;
4. Opacity of vitreous body: 2 (2.7%) eyes.

In a few days after injection the resorption of conjunctiva hemorrhages was displayed. The same was noted with the opacity of vitreous body.

The occurrence of full or partial detachment in PHM of vitreous body was connected with an advanced age of the patient and atherosclerotic background while manipulation served as a starting moment. The treatment of vitreous body PHM is not required as, probably, it might be a positive factor for the affected retina of the eye.

According to abovementioned complications, close attention must be drawn to the increase of intraocular pressure. The angle-closure glaucoma has been diagnosed at an early stage in two eyes of a patient after IVA. In this case IVA has probably served as a stress testing.

The analysis of complications caused by intravitreal injection of avastin identifies the transient character, relative safety and non-toxicity.

Summing-up the results of treatment in patients with neovascular form of AMD brings to the conclusion that avastin as an inhibitor of vascular endothelial growth factor is an effective medicine for treatment of this serious disease. n

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