

Analysis of the Progress of Anti VEGF Treatment for Fundus Diseases

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Abstract

Fundus disease does not refer to a specific disease, but occurs in the human fundus diseases, such as retinopathy, optic neuropathy, vitreous inflammation, vascular disease, tumor, etc., especially diabetic retinopathy, the etiology is complex, can seriously damage the visual function of patients, if not timely diagnosis and treatment, it is likely to cause blindness, resulting in lifelong disability, need to pay attention to. In recent years, with the continuous development of medical technology, the treatment of fundus diseases has become more and more diverse. With the successful application of anti vascular endothelial growth factor (anti VEGF) therapy, anti VEGF therapy has gradually become the preferred treatment for patients with fundus diseases. In this paper, the research progress of anti VEGF treatment of fundus lesions in recent years is reviewed.

Keywords

Anti VEGF therapy; Fundus lesions; Progress analysis.

1. OBJECTIVE

Fundus is an important part of human eyeball, including vitreous, retina, choroid, ciliary body and other tissues. Fundus diseases are symptoms or diseases induced by a variety of degenerative diseases or multisystem diseases. In recent years, due to the popularity of electronic products, the lack of awareness of eye hygiene and other factors, the incidence of fundus diseases has increased year by year, which has become an important threat to the eye health of Chinese residents. It is necessary to reduce the quality of the population and give effective diagnosis and treatment. Anti VEGF therapy is widely used and has achieved significant clinical effect. This paper reviews the research on anti VEGF therapy for fundus diseases in recent years, so as to provide reference for the treatment of patients with fundus diseases.

2. ANTI VEGF THERAPY

2.1. VEGF

VEGF is a human vascular endothelial cell specific heparin binding growth factor with highly conserved homodimer glycoprotein, which can directly act on human vascular endothelial cells, promote the proliferation of vascular endothelial cells, and increase vascular permeability [1]. In the research of some scholars, VEGF can also promote the degeneration of extracellular matrix, make vascular endothelial cells migrate and induce angiogenesis, and the monomer decomposed by VEGF is inactive [2]. Therefore, it is commonly used in the treatment of benign vascular hyperplasia, tumor related to vascular hyperplasia and other diseases. It can control the development of the disease by inhibiting the formation of new blood vessels, such as

slowing down the development of tumor, making the tumor tissue lose nutrition, so as to achieve the goal of disease treatment.

2.2. Anti VEGF Drugs

At the present stage, the common anti VEGF drugs in clinic are pegtanide sodium, bevacizumab, ranibizumab and conbercept, which are administered by intravitreal injection. Pegtanide sodium is the first anti VEGF drug approved for clinical treatment in the world. It was approved by the US Food and Drug Administration in 2004. Its main indication is age-related macular degeneration, which can effectively solve the problem of neovascularization in elderly patients. However, in the follow-up study, it was found that the drug mainly exerts its efficacy by specifically combining with VEGF165 and is different from other VEGF. The structure or active lysate can not be combined to play a role, so the application limitation is high [3]. Bevacizumab is a humanized anti VEGF recombinant mouse monoclonal antibody. Its main indication is metastatic colorectal cancer. Its mechanism of action is similar to that of pegtanide sodium, but it has the characteristics of antagonizing all VEGF-A isomers. Bevacizumab can also achieve certain curative effect in macular edema, retinopathy of prematurity and other ocular fundus diseases. It is widely used in the treatment of ocular fundus diseases in many western countries. However, it is rarely used in China.

According to clinical statistics, the two most commonly used anti VEGF drugs in China are ranibizumab and conbercept [4]. Ranibizumab has the characteristic of nonspecific binding to multiple bioactive VEGF-A isomers, while conbercept is the fusion protein of VEGF receptor and Fe fragment. Both of them can block VEGF related cascade reaction, inhibit angiogenesis and reduce edema. In addition, Xu Jianfeng and other [5] scholars pointed out in the study that ranibizumab and conbercept have the advantages of high affinity and strong penetration. After medication, the drug can penetrate through the fluoroscopic omentum and reach the lesion area quickly, with fast onset, safety and efficiency.

3. FUNDUS LESIONS

3.1. Diabetic Retinopathy

Diabetic fundus disease is the most common type of fundus disease in clinic, and it is also the main cause of blindness or visual impairment in diabetic patients. It is classified as the main disease of human blindness in developed countries. According to the survey, in 2019, the prevalence rate of diabetes among Chinese residents has reached about 10.9%. In terms of 1.4 billion people, the total number of diabetic patients in China is about 152 million. It is of great significance to pay attention to diabetic fundus lesions and give effective diagnosis and treatment [6].

3.2. Age Related Macular Degeneration

In recent years, China's population aging process is accelerating, and the number of elderly population is growing rapidly. Due to the growth of age, the physical function of the elderly population is gradually declining, and the body's resistance and immunity are low, which creates conditions for the progress of disease. Senile macular degeneration is a common degenerative disease in the eyes of the elderly, which can be divided into atrophic type and exudative type. The atrophic type includes choroidal capillary atrophy, vitreous membrane thickening, retinal pigment epithelium atrophy, while the exudative type shows brown yellow or brown black subretinal hemorrhage. With the progress of the disease, both atrophic type and exudative type can present retina and choroid. The pathological manifestations were atrophy of membrane and scar.

3.3. Others

Retinal vascular diseases and tumors are also common fundus diseases.

4. THE PROGRESS OF ANTI VEGF TREATMENT FOR FUNDUS DISEASES

Anti VEGF therapy for fundus diseases has a long history in foreign countries. There are many kinds of drugs and treatments, including surgery, laser photocoagulation, intravitreal injection, etc. Taking macular edema as an example, the more effective scheme for the treatment of macular edema at this stage is macular grid laser photocoagulation, mainly through the principle of photocoagulation, laser irradiation stimulates a large amount of melanin absorption in patients' retinal epithelium, causes glial scar to replace sensory cells, reduces the oxygen consumption of retina, and promotes the transmission of outer oxygen to inner layer, so as to achieve the therapeutic effect. In China, the anti VEGF treatment of fundus diseases started late, which is limited by economic and geographical factors. At present, there are not many hospitals that can carry out such treatment, and the treatment scheme is relatively single. Most of them are anti VEGF treatment of triamcinolone acetonide glucocorticoid anti-inflammatory and ranibizumab and conbercept intravitreal injection combined with photocoagulation, but the curative effect is still good.

Zhou Lei and other [7] scholars selected 57 cases (62 eyes) of patients with diabetic retinopathy in the study and applied panretinal photocoagulation therapy and anti VEGF drugs combined with panretinal photocoagulation therapy respectively. The results showed that the leakage area of retinal neovascularization, macular lesion center thickness and plasma VEGF level of patients treated with combination therapy were lower than those of patients treated with single photocoagulation therapy. The best corrected visual acuity at 1 month, 3 months and 6 months after photocoagulation was higher than that of single photocoagulation. Huang Lili and other [8] scholars studied 58 cases (93 eyes) of proliferative diabetic retinopathy complicated with macular edema, respectively treated with ranibizumab combined with laser and laser alone. The results showed that the best corrected visual acuity and macular central thickness of patients treated with combination therapy were better than those treated with single laser. The effectiveness of anti VEGF therapy was confirmed.

5. SUMMARY

Fundus disease is a common ophthalmic disease, which seriously affects the eye health of Chinese residents. It can lead to vision loss or blindness, and reduce the quality of the population. It needs timely diagnosis and treatment. Anti VEGF therapy is a common treatment for ocular fundus diseases, which has significant therapeutic effect, good prognosis, low side effects and broad application prospects. However, our country started late, the treatment drugs and medication schemes are relatively single, it is still necessary to further study, expand the combined treatment scheme, and better promote the rehabilitation of patients with fundus diseases.

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