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Original article

Observation on health quality of life before and after the injection of antiangiogenic drug in vitreous cavity to patients with wet age-related macular degeneration☆

Dan-Dan Wang [a, 1], Pei-Ying Xu [b, 1], Tian-Yu Wang [a, 1], Xiao-Xia Chen [a, 1], Qing Peng [a, *]

[a] Department of Ophthalmology, Xinhua Hospital, Shanghai Jiaotong University School of Medicine, Shanghai 200092, China
[b] Shanghai Minhang Hospital, Fudan University, Shanghai 201199, China

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ABSTRACT

Objective: To explore the vision related health quality-of-life before and after the injection of anti-angiogenic drug in vitreous cavity to patients with wet-AMD.
Methods: The 2000 edition of Visual Functioning Questionnaire-25 issued by National Eye Institute is applied, and the VRQL evaluation is conducted on the initial diagnosed patients with wet-AMD before and after the injection of ranibizumab drugs in vitreous cavity.
Results: Among the wet-AMD patients, patients with better distance visual acuity before the intravitreal injection get lower VFQ-25 score; while after the vitreous cavity injection, the VFQ-25 questionnaire score is related to the explanation and nursing of doctors and nurses towards patients, the better the nursing, the higher the score.
Conclusion: Before vitreous cavity injection, the degree of distance visual acuity is an important factor affecting VRQL of wet-AMD patients, in addition, the explanation and nursing of doctors and nurses toward patients during pre-operation, intra-operation and post-operation of intravitreal injection are also the import factors affecting VROL.
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1. Introduction

Age-related macular degeneration (AMD) is one of the major causes of blindness in the elderly. AMD usually occurs in people over the age of 45, with both eyes got the disease at the same time or successively, the vision damage is progressive, which can seriously affecting the quality of life of older person.[1,2] Along with social progress and improvement of living standards, people are requiring increasingly high demand of quality life, therefore, the demand for understanding of early AMD and effective treatment are becoming urgent. Clinically, AMD is divided into two types: the first one is atrophic AMD, also known as dry AMD, which is characterized by a progressive retinal pigment epithelium (RPE) atrophy, leading to degeneration of photoreceptor cells, and causing central vision loss; the second one is exudative AMD, also known as wet AMD or senile discoid macular degeneration, which is characterized by the formation of abnormal choroidal neovascularization under RPE, causing varying degrees of edema, exudation, hemorrhage and scar change in macular region of eyes ground. In June 2006, the FDA approved that Lucentis drug was available for the treatment of intravitreal injection for wet-AMD patients. Lucentis drug is a recombinant humanized monoclonal antibody fragment (Fab), targeted inhibition of vascular endothelial growth factor A (VEGF-A), thus inhibiting the combination of VEGF-A with its receptors VEGFR-1 and VEGFR -2, preventing proliferation of vascular endothelial cell and angiogenesis of new vessels.[3–5] In Dec, 2011, it was approved by SFDA for clinical, with very significant clinical treatment effect, but the surgery has certain risks and affecting factors. The explanation to patients and nursing during pre-operation, intra-operation and post-operation also play a very important role to the surgery success, our experience is reported as follows.

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* Corresponding author.
E-mail address: DrQingPeng@126.com (Q. Peng).
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[1] Authors Dan-Dan Wang, Pei-Ying Xu, Tian-Yu Wang, and Xiao-Xia Chen, equally contributed to this study.

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2. Subjects and methods

2.1. Survey subjects

It is a retrospective analysis regarding the basic situation of our first diagnosed 20 cases patients suffering from wet-AMD in single eye from 2012 to 2013. In the 20 cases, there are 11 males account for 55%, and 9 females account for 45%, aged from 41 to 68 years old, with an average age of 57.68, 3 cases with the vision from 0.01 to 0.05 account for 15%, 15 cases with the vision from 0.05 to 0.3 accounts for 75%, 2 cases with the vision from 0.3 to 0.5 accounts for 10%, their eyes have no other anterior segment and posterior segment diseases (such as glaucoma, diabetic retinopathy, retinal detachment, etc.) and systemic disease, patients have a certain understanding ability, who have also filled out the VFQ-25 questionnaire carefully before and after vitreous cavity injection surgery.

2.2. Methods

2.2.1. Eyes examination

During the initial diagnosis, Snellen international standard distant vision chart with lamp house is applied to measure patients' best corrected visual acuity of both eyes, at the same time, a non-contact tonometer (NIDEK, NT-2000) is used to measure intraocular pressure, and a slit lamp to exam anterior segment, the standard 90-degree pre-focusing mirror to exam eye ground, in addition with 3D-OCT (Topcon, 3D OCT-1000) and HRA2 fundus fluorescence angiography for clear diagnosis, in the end, 16 cases of patients are diagnosed with typical wet-AMD, and 4 cases are diagnosed with latent wet-AMD.

2.2.2. Fill out the VFQ-25 questionnaire

After the eyes examination, all of the subjects have to fill out VFQ-25 questionnaire, and measure the VRQLscore. VFQ-25 questionnaire consists of three parts, namely, (1) the overall health condition and vision: including the degree of self-satisfaction toward systemic disease and the binocular vision correction; (2) activities: including reading newspapers and street signs, finding items, outdoor activities and driving; (3) the consequences of vision problem: including limited mobility, unable to do what wanted, and the psychological feeling brought about because of vision, the higher the score of VFQ-25 questionnaire, the worse the VRQL.

2.2.3. Method of intravitreal injection of Lucentis

Currently, the most common and most effective way to cure wet-AMD is intravitreal injection of anti-vascular endothelial growth factor (anti-VEGF) drugs. After the definite diagnosis for above patients, Lucentis drug is injected in vitreous cavity, the operation requires very strict sterilization operating room. After at least 3 times of ocular surface anesthesia, the eyes around is sterilized and ready with towel, sterile eye speculum is used, and the roots of eyelashes are disinfected, and then disinfect the conjunctival sac once again with PVP. Extract 0.05 ml drug with 1 ml sterile syringe, replace the needle with a special needle for 30G intravitreal injection, empty the air to the needle tip, the needle should be injected at 3.5–4.0 mm backward of limbus, align with the eye center, and perpendicular to the sclera in vitreous cavity, but to pay attention that the entry point on bulbar conjunctiva and scleral surface are better not to point the same site, so as to reduce the possibility of postoperative infection of the eye, then slowly push the 0.05 ml injection into the vitreous cavity, before that 0.05 ml aqueous liquid should be extracted from patients who have done cataract surgery and implanted with intraocular lens to prevent the Lucentis injection permeates through the aqueous due to intraocular lens implantation, after injection, press the needle eye for 3–5 min, lay over the TobraDex eye ointment and bind up with sterile gauze. For patients needs both eyes treatment, a new injection is required for the other eye, in addition, the sterile towel, syringe, gloves, surgical drape, speculum, and injection needles are all needed to be changed before injected to the other eye.

2.3. Nursing before and after intravitreal injection

First of all, ask the patients to instill antibiotic drop by themselves three days before the injection, 4 times a day, with the purpose to eliminate the infection in conjunctiva of the eye and circumocular; second, as the price of Lucentis is quite expensive (9800 Yuan/injection), therefore, before the injection, it requires detail explanation of it, that is the disease can be controlled, but the vision is not necessarily be improved; third, circumocular and systemic condition (such as intraocular pressure, blood pressure, blood sugar, liver and kidney function, ECG) are required to be controlled in the normal range, and without drug allergies; fourth, anti-inflammatory eye drops should be used for 7 to 10 days consecutively, no bath within 24 h, and no rubbing eyes hard within one week, in particular, the coal mining, high-altitude operation, long-time driving and other hazardous work can't be performed within one week. Fifth, inform the patients that if there is red eyes pain, subconjunctival hemorrhage (Fig. 1), vision blurs more, eyes swelling or general discomfort, please come to the hospital for treatment timely to avoid serious complications that may occur. The nursing we talked about after injection is also consistent with the report of Li Yong and other scholars. During the follow-up after one year, the 20 patients' eyes BCVA, IOP, 3D-OCT and fundus angiography should be checked again and the patient will be asked to fill out a detailed VFQ-25 questionnaire.

3. Results

Scores of the 20 wet-AMD patients in the initial filling out of VFQ-25 questionnaire are as follows: the therapeutic visual acuity is divided into three ranges, respectively, 0.01–0.05,0.05–0.3 and 0.3–0.5, in each range, the higher the BCVA for contralateral non-treated eye, the lower the score of VFQ-25 questionnaire, that is the patient has higher VRQL. Patients in the range of 0.05 to 0.3 have the lowest average VFQ-25 questionnaire score, that is, they have higher VRQL, which is corresponding to the highest BCVA average value for non-treated eye; Patients in the range of 0.01 to 0.05 have the highest average VFQ-25 questionnaire score, that is, they have lower VRQL, which is corresponding to the lowest BCVA average value for non-treated eye; Patients within the range of 0.3 to 0.5 have the average VFQ-25 score, which is also match with the fact the BCVA average value for non-treated eye is in between.

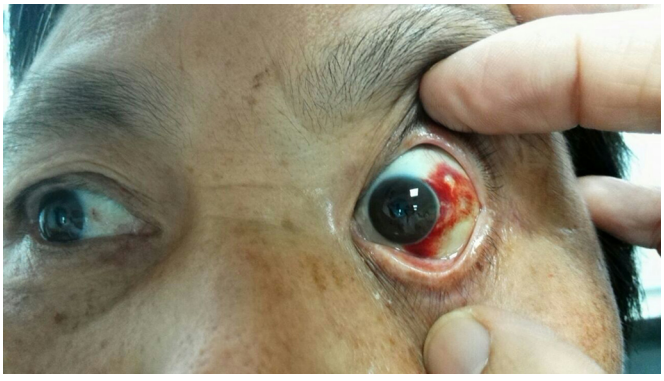

Fig. 1. Subconjunctival hemorrhage after intravitreal injection in the left eye.

Results for the inspection of one year follow-up: 12 cases of patients have improved their visual acuity by more than 3 lines accounts with better and cured fundus photography (Fig. 2a, b), 5 cases of patients have no significant visual acuity improvement and accounting for 25.0%, 3 cases of patients even have decreased visual acuity compared with the baseline value due to various complications and accounting for 15.0%, the reasons for diminution of vision in these cases including vitreous hemorrhage, atrophic scarring in macular lesions (Fig. 3a, b), etc. Our results are consistent with Mitchell report.[5] During the one year follow-up after injection of Lucentis drug, the improvement of care vision and the nursing as well as explanation of doctors toward patients have a significantly influence on the final score of VFQ-25.

4. Discussion

Wet-AMD is more rapidly progressed compared with dry-AMD, it causes the oozing, bleeding, swelling and scarring of the macula, and seriously affecting the patients' central vision. Clinically, for patients with wet AMD, all of the different treatment methods can get a certain effect, but each treatment has risks, for example, although the photodynamic therapy (PDT) can effectively control the disease progression, it also effects the restoration of visual function,[6,7] which requires actively and effectively communication and explanation with patients prior to treatment; Another treatment method is intravitreal injection of anti-VEGF drug, this treatment can improve vision while no form of obvious scars in the macula,[8] thereby it has an important role of restoring visual function and improving visual quality, however, this method also has its disadvantage, that is approximately 0.05% of the patients occurs with endophthalmitis,[9] about approximately 0.01% of the patients will have stroke or cerebrovascular accident.[10,11] From our research result, 3 patients end up having poor therapeutic effect, the reasons are as follows: complications occur after a variety of drug injection, such as vitreous hemorrhage, lesion obvious scarring, as well as latent wet-AMD patients have a poor sensitivity toward anti-VEGF drugs.[12]

This experiment studies the main factors affecting VRQL before and after the injection of intravitreal Lucentis drug, prior to the treatment, patients rely on the good eye during daily life, thereby, the better the distant vision, the higher the VRQL, which is consistent with the research result from Zou Haidong and Immonen, et al.[2,13–15] After the treatment of intravitreal injection of drug on the eye with poor vision, the subjective experience of patients can significantly affect VRQL, as the patients are looking forward to the efficacy, and there will be mentally and financially burden, so the work of doctors, including nursing, health education and explanation will also affect the patients' VRQL. This phenomenon is also consistent with the results of Keeffe's observation.[16]

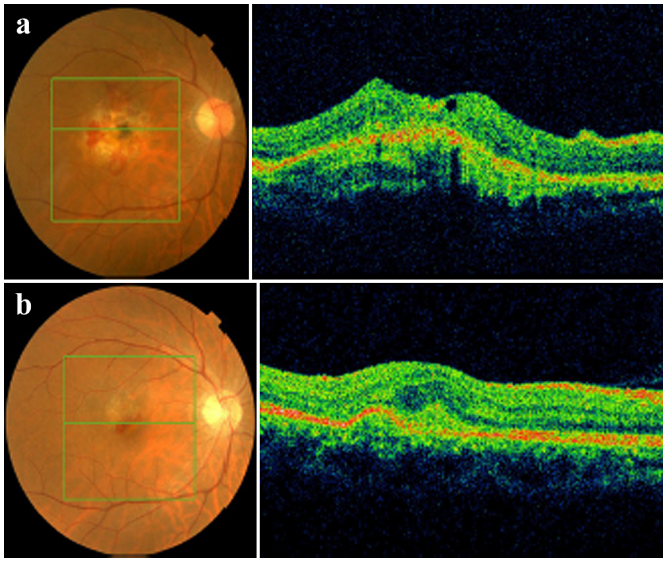

Fig. 2. a. Color Fundus and OCT picture pre-intravitreal injection with wet-AMD; hemorrhage and edema in the macula were noted. b. Color fundus and OCT picture post-intravitreal injection of wet-AMD after 1month; hemorrhage and edema in the macula area almost disappeared.

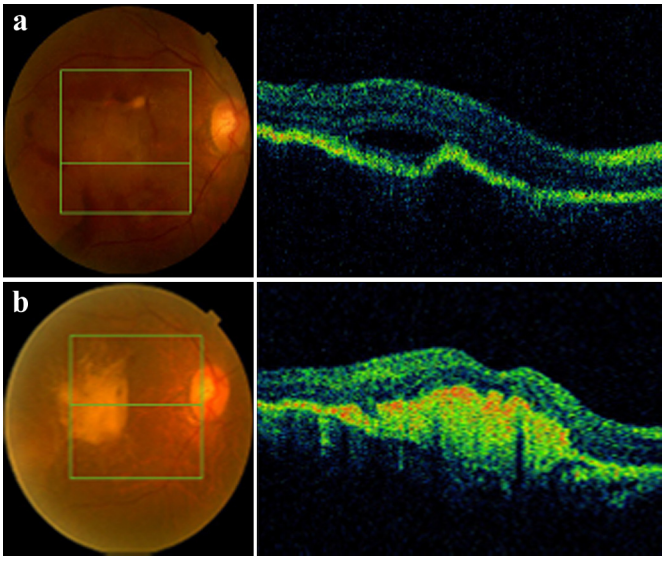

Fig. 3. a. Color fundus and OCT picture pre-intravitreal injection with wet-AMD accompanied by retinal hemorrhage and edema of the macula. b. Color fundus and OCT picture post-intravitreal injection after 3 months; retinal hemorrhage and edema disappeared but obviously a scar formed in the macula.

5. Conclusion

Prior to the treatment, for wet-AMD patients, the distant vision of the good eye is crucial to the vision function related quality of life; while after the intravitreal injection of drug, the main factors affecting the vision function related quality of life including the accuracy of diagnosis and the skills of injection, as well as the explanation and nursing, and the recovery of the poor eye. Therefore, after the injection of anti-VEGF drug, the improvement of visual function and quality of life are depending on the doctor's skills, nurses' caring as well as the understanding and cooperation of patients.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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