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Analysis of the Efficacy of Triamcinolone Acetonide Combined with Ranibizumab in the Treatment of Fundus Diseases

Wanqiu Jiao, Jingwei Zhang, Ning Ma, Zhigang Ma*

Harbin Eye Hospital, Harbin 150010, Heilongjiang Province, China

***Corresponding author:** Zhigang Ma, mzgeye070802@163.com

Abstract: *Objective:* To analyze the effect of triamcinolone acetonide combined with ranibizumab in patients with fundus diseases. *Methods:* 100 patients with fundus diseases admitted from January 2018 to January 2023 were selected. The patients were separated into two groups according to the random number table method, with 50 cases in the control group (treated with ranibizumab), and 50 cases in the observation group (treated with triamcinolone acetonide combined with ranibizumab). The clinical effects of both treatment regimens were compared. *Results:* The time taken for symptom disappearance of the observation group was shorter than that of the control group ($P < 0.05$). The observation group had higher naked-eye visual acuity (4.18 ± 0.89) compared to the control group. Besides, the observation group also had lower intraocular pressure (14.19 ± 1.33 mmHg) and retinal thickness (283.14 ± 3.29 μm), with ($P < 0.05$) compared to the control group. Moreover, the observation group had a lower adverse reaction rate and a higher quality of life ($P < 0.05$). *Conclusion:* The application of triamcinolone acetonide combined with ranibizumab treatment can quickly relieve the clinical symptoms of patients with fundus disease, improve visual acuity, intraocular pressure, and retinal thickness, with low adverse reaction rate and better prognosis and quality of life.

Keywords: Intravitreal injection of ranibizumab; Monoclonal antibody treatment; Fundus diseases; Adverse reactions; Quality of life

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1. Introduction

Fundus disease is an ophthalmic disease that mainly occurs in the posterior segment of the eye. It greatly impacts the blood circulation of the eyes and interferes with the microcirculation of the human body. Patients generally feel no obvious discomfort in the early stages of the disease, but in the middle and later stages, their vision will become significantly impaired [1]. If treatment is delayed, it can easily lead to blindness. Ranibizumab can bind to vascular endothelial growth factors to inhibit its binding to other receptors and can also hinder the formation of new blood vessels. After intravitreal injection, the patient's symptoms, such as retinal and macular edema, can be effectively relieved, and it has a positive impact on normalizing the

intraocular pressure and improving vision [2]. Triamcinolone acetonide has many biological effects, including anti-neovascularization, anti-tissue fibrosis, and anti-capillary leakage. In this study, we selected 100 patients with fundus diseases to analyze the effect of triamcinolone acetonide combined with ranibizumab, and the details will be explained in the following section.

2. Materials and methods

2.1. General information

100 patients with fundus diseases admitted between January 2018 and January 2023 were selected. Inclusion criteria: (1) diagnosed with fundus disease by eye angiography, (2) no drug contraindications and good compliance, (3) agreed to the study. Exclusion criteria: (1) presence of other eye diseases, (2) those with serious organ diseases or malignant tumors; (3) those with a recent history of surgery. The patients were grouped through the random number table method. The control group consisted of 28 males and 22 females, aged between 21 and 78 years (mean: 38.42 ± 2.36 years). The course of disease of this group was 2 to 6 months (mean: 3.72 ± 1.21 months). The cases included in the control group were 20 cases of retinal disease, 11 cases of optic disc disease, and 19 cases of choroidal disease. The observation group consisted of 27 males and 23 females, aged between 22 and 77 years (mean: 38.49 ± 2.39 years). The course of disease of this group was 2 to 8 months (mean: 3.75 ± 1.23 months). In this group, there were 23 cases of retinal disease, 10 cases of optic disc disease, and 17 cases of choroidal disease. There was no statistical significance between the two groups of data ($P > 0.05$).

2.2. Method

The control group was given an injection of 0.5 mg ranibizumab per month (a total of 3 injections over the course of treatment). The observation group received an additional subconjunctival injection of 16 mg of triamcinolone acetonide after the first intravitreal injection of ranibizumab. Both groups were given antibiotic eye drops 4 times/d 3 days before the injection and 1 week after the injection. The patients' conjunctival sac and tear duct were carefully rinsed before surgery.

2.3. Observation indicators

2.3.1. Time taken for symptom disappearance

The time taken for the disappearance of new blood vessels, retinal hemorrhage, and retinal edema, and the time taken for retinal thickness to return to normal were calculated in both groups.

2.3.2. Improvement of clinical symptoms

The changes in the naked-eye visual acuity, intraocular pressure, and retinal thickness of the two groups before and after treatment were statistically analyzed.

2.3.3. Rate of adverse reactions

The occurrence of dizziness, nausea, and eye pain in the two groups was recorded.

2.3.4. Quality of life

A short-form survey (SF-36) was used to evaluate the quality of life of the patients. The total score was 100 points, with a higher score indicating a better quality of life.

2.4. Statistical analysis

SPSS 27.0 was chosen as the software for data analysis. Measurement data were presented as mean mean ± standard deviation and analyzed by a *t*-test. Count data were expressed as *n* (%) and analyzed by a χ^2 test, with $P < 0.05$ indicating statistically significant.

3. Results

3.1. Time taken for symptom disappearance

The time taken for symptom disappearance of the observation group was shorter than that of the control group ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of time for symptom disappearance between the two groups (mean ± standard deviation, d)

Group	*n*	Time taken for retinal edema disappearance	Time taken for retinal thickness to return to normal	Time taken for retinal hemorrhage disappearance	Time taken for new blood vessel disappearance
Observation group	50	13.18 ± 1.75	12.05 ± 0.72	13.57 ± 1.24	13.56 ± 1.14
Control group	50	17.06 ± 2.05	16.58 ± 1.54	17.52 ± 1.65	15.52 ± 2.03
t	-	10.179	18.842	13.532	5.953
P	-	0.000	0.000	0.000	0.000

3.2. Clinical indicators

After treatment, the naked-eye visual acuity of the patients in the observation group was higher than that of the control group, and their intraocular pressure and retinal thickness were lower than those of the control group ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of clinical indicators between the two groups (mean ± standard deviation)

Group	*n*	Naked-eye visual acuity		Intraocular pressure (mmHg)		Retinal thickness (μm)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	50	2.11 ± 0.44	4.18 ± 0.89	19.14 ± 3.21	14.19 ± 1.33	395.28 ± 6.75	283.14 ± 3.29
Control group	50	2.12 ± 0.43	3.15 ± 0.68	19.19 ± 3.24	16.18 ± 1.36	395.21 ± 6.72	344.15 ± 4.28
t	-	0.115	6.503	0.078	7.397	0.052	79.914
P	-	0.909	0.000	0.938	0.000	0.959	0.000

3.3. Rate of adverse reactions

The rate of adverse reactions of the observation group was lower than that of the control group ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of rate of adverse reactions between the two groups (*n* [%])

Group	*n*	Nausea	Vomiting	Eye pain	Total incidence
Observation group	50	1 (2.00)	1 (2.00)	0 (0.00)	2 (4.00)
Control group	50	2 (4.00)	3 (6.00)	4 (8.00)	9 (18.00)
χ^2	-	-	-	-	5.005
P	-	-	-	-	0.025

3.4. Quality of life

The quality of life of the observation group was higher than that of the control group ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of quality of life between the two groups (mean ± standard deviation, points)

Group	*n*	Cognitive function	Physical function	Emotional function	Role function	Social function
Observation group	50	79.32 ± 18.25	76.42 ± 15.18	79.45 ± 18.36	85.46 ± 12.56	88.12 ± 10.04
Control group	50	68.13 ± 14.15	60.29 ± 12.27	66.25 ± 16.78	72.25 ± 10.28	80.79 ± 8.27
t	-	3.426	5.843	3.753	5.755	3.985
P	-	0.000	0.000	0.000	0.000	0.000

4. Discussion

As an important organ of the human body, the eyes directly affect our daily lives. The vitreous body lacks blood vessels. Lesions or pathological changes in the surrounding eye tissues, particularly fundus diseases, can affect the vitreous body [3]. Fundus diseases are diseases that occur at the posterior segment of the eye. Fundus diseases can damage the patient's vision to varying degrees, significantly interfering with their daily functions and decreasing their quality of life. Hence, it is crucial to use the eyes judiciously, minimizing irrational use, to prevent vision loss due to visual impairment. Delayed treatment can significantly impact the patient's visual health and, in severe cases, may lead to blindness [4].

Early and effective treatment of fundus diseases can minimize the patient's visual function and reduce the chances of going blind. Symptomatic treatment with laser, hormones, or drugs is often used clinically, but they are less effective [5]. If the problem of vascular permeability in patients with fundus disease is not thoroughly treated, the condition can easily relapse, and the patient's quality of life cannot be effectively improved. Overexpression of vascular endothelial growth factor (VEGF) plays a key role in the occurrence and development of fundus diseases. It can promote the growth and proliferation of vascular endothelium and increase vascular permeability. These are the main factors in the pathogenesis of fundus diseases [6]. Ranibizumab is an IgG1 isotype monoclonal antibody that can bind to VEGF. It can bind to the VEGF-A subtype in the human body, thereby inhibiting its receptor performance. It can effectively penetrate the retina and relieve retinal edema, which is beneficial to patients. Besides, it improves the quality of vision, and helps regulate intraocular pressure, with better treatment effect. The half-life of this drug after intravitreal injection is 2.8 days, and the serum concentration in the vitreous is lower than the concentration in the eye. Ranibizumab injection can bind with VEGF, leading to a reduction in blood vessel wall permeability and the inhibition of retinal neovascularization [7,8].

This study shows that after treatment, compared with the control group, the time taken for the disappearance of retinal edema (13.18 ± 1.75 d), the retinal thickness return to normal (12.05 ± 0.72 d), the disappearance of retinal hemorrhage (13.57 ± 1.24 d), the time for the disappearance of new blood vessels (13.56 ± 1.14 d) of the patients in the observation group was shorter. Besides, their naked eye visual acuity was higher and their intraocular pressure and retinal thickness were lower ($P < 0.05$). Therefore, it is clear that triamcinolone acetonide combined with ranibizumab treatment can quickly improve the clinical symptoms of patients with fundus diseases by improving their visual acuity, reducing their intraocular pressure and retinal thickness, therefore accelerating their recovery [9]. This study showed that compared with the control group, the observation group had a lower rate of adverse reactions and higher quality of life ($P < 0.05$). It shows that treating patients with fundus diseases with triamcinolone acetonide combined with ranibizumab can improve the patients' health. Ranibizumab has the characteristics of a short drug half-life and low serum concentration. Subconjunctival injection of triamcinolone acetonide can be given after the initial intravitreal injection. This combination effectively counters fundus inflammation, ensuring a relatively safe treatment that can enhance patients' quality of life [10].

5. Conclusion

In summary, triamcinolone acetonide combined with ranibizumab treatment can quickly relieve the symptoms of patients with fundus diseases, improve their visual acuity, effectively restore intraocular pressure, reduce retinal thickness and rate of adverse reactions, and promote the improvement of their quality of life.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Zhan T, Liu W, 2020, Effect of Intravitreal Injection of Ranibizumab Injection in the Treatment of Fundus Diseases. Chinese Contemporary Medicine, 27(29): 146–148 + 155.

[2] Chang H, Qi F, Xu L, et al., 2020, Clinical Effect of Intravitreal Injection of Ranibizumab Injection in the Treatment of Fundus Diseases. Chinese Journal of Misdiagnosis, 15(07): 305–307.

[3] Lan F, Zhang G, He H, et al., 2023, Clinical Analysis and Efficacy Observation of Reactivation of Retinopathy of Prematurity After Intravitreal Ranibizumab Injection. Chinese Journal of Fundus Diseases, 39(6): 471–475.

[4] Sun X, Chen P, Wang X, et al., 2019, Clinical Observation of Intravitreal Injection of Ranibizumab in the Treatment of Retinopathy of Prematurity. Chinese Journal of Practical Ophthalmology, 37(1): 26–29.

[5] Wu Z, Li J, Qi Z, et al., 2019, Effect of Intravitreal Ranibizumab Injection in Treating Fundus Diseases. Chinese Modern Drug Application, 13(5): 6–8.

[6] Guo Q, 2020, Effect of Intravitreal Injection of Ranibizumab Injection in the Treatment of Fundus Diseases. Shenzhen Journal of Integrated Traditional Chinese and Western Medicine, 30(5): 148–150.

[7] Lin Y, Zhou Q, 2019, Clinical Efficacy of Intravitreal Ranibizumab Injection in Treating Wet Age-Related Macular Degeneration. Chinese Journal of Gerontology, 39(9): 2180–2182.

[8] Liang S, Chen Q, Hu C, et al., 2020, Observation on the Efficacy of Prolonged Photodynamic Therapy Combined with Intravitreal Injection of Ranibizumab in the Treatment of Solitary Choroidal Hemangioma in the Posterior Pole. Chinese Journal of Ophthalmology, 36(2): 116–120.

[9] Zhu C, Pan L, Yi Q, et al., 2022, Effects of Intravitreal Injection of Ranibizumab on the Expression Levels of Cytokines in the Aqueous Humor of Patients with Macular Edema Secondary to Branch Retinal Vein Occlusion. Chinese Journal of Ophthalmology, 38(9): 739–743.

[10] Li X, Wang Y, Wang L, et al., 2021, Clinical Efficacy Observation and Application Value Analysis of Intravitreal Injection of Ranibizumab in the Treatment of Diabetic Retinopathy. Shanxi Medical Journal, 50(4): 593–595.