Clinical Efficacy of Sodium Hyaluronate Eye Drops Combined With Pranoprofen in the Treatment of Patients with Dry Eye

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To investigate the clinical efficacy of sodium hyaluronate eye drops combined with pranoprofen in the treatment of patients with dry eye. Total 72 patients with dry eye in our hospital from August 2019 to October 2019 were randomly divided into observation group and control group. In addition to the same basic treatment, the observation group used pranoprofen combined with sodium hyaluronate eye drops, while the control group only used sodium hyaluronate eye drops. The data changes of tear secretion test (Schirmer test) penetration length and tear film break-up time, quality of life and treatment effect were compared between the two groups. After treatment, the wet length of filter paper in the observation group was significantly longer than that in the control group. Comparing the time of tear film rupture before and after treatment, it was found that the time from blink to tear film rupture in the observation group was significantly longer than that in the observation group ($p<0.05$). In addition, the scores of physical function, physical pain, physical function, social function and mental health in the observation group were higher than those in the control group ($p<0.05$). Finally, the total effective rate of the treatment group was 100.00 % and that of the control group was 77.78 % ($p<0.05$). Pranoprofen combined with sodium hyaluronate has a very good effect in the treatment of dry eye after cataract surgery, which can increase the tear secretion, keep the eyeball moist, improve the stability of tear film and improve the quality of life of patients, which is worthy of wide application and promotion.

Key words: Dry eye, pranoprofen, sodium hyaluronate, photophobia

Dry eye, as a common disease of Ophthalmology, has been increasing in recent years[1,2], which is inextricably linked to people's habits (such as the wide use of contact lenses and many electronic products) and environmental changes[3]. The clinical manifestations of dry eye include dry eyes, photophobia and fear of wind. In severe cases, inflammation of eyes, swelling, pain and corneal lesions appear, which eventually lead to the decline of vision[4]. At present, the specific causes of dry eye are not clear, but the main reasons are as follows: Insufficient lacrimal secretion of lacrimal gland in aqueous layer is one of the most common causes; The insufficient secretion of oil layer is mainly caused by eye diseases and abnormal meibomian gland function; The secretion of mucin layer was insufficient; Excessive evaporation of tear and uneven distribution of tear film. The treatment of dry eye is based on the above theory. Due to the decline of the quality of tear secretion, the treatment of primary disease is based on the supplement of exogenous local tear analogues[5]. At present, the most commonly used substitute in clinic is sodium hyaluronate eye drops. Because its composition and various coefficients are close to tears, it is the most basic treatment for dry eye[6]. In recent years, relevant scholars have reported that pranoprofen combined with sodium hyaluronate eye drops is more effective in the treatment of dry eye, but such studies are still rare in clinic[7,8]. Therefore, this study mainly analyzes the therapeutic effect of pranoprofen combined with sodium hyaluronate on dry eye. A total of 72 patients with dry eye in our hospital from August 2019 to October 2019 were selected as the research objects. The inclusion criteria were: diagnosed with dry eye after glaucoma surgery[2]; Clear consciousness; He and his

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family members were informed and agreed to participate in this study. The exclusion criteria were: severe organic lesions of important organs; Combined with other eye diseases; Due to the existence of mental disorders, neurological dysfunction and cannot normally cooperate with the treatment. The patients were randomly divided into treatment group (36 cases) and control group (36 cases). The treatment group was treated with sodium hyaluronate combined with pranoprofen, while the control group was only treated with sodium hyaluronate. There were 17 females and 19 males in the treatment group, aged from 24 to 65 y old, with an average of (39.6±3.6) y old. There were 18 females and 18 males in the control group, aged from 25 to 66 y old, with an average of (39.4±3.7) y old. There was no significant difference in age, gender and other general information between the two groups ($p>0.05$). All patients with dry eye had fully informed consent and signed the consent form. This study was approved by the ethics committee of our hospital. Control group-Patients with dry eye were given sodium hyaluronate eye drops (Zhongshan branch of Zhuhai federal Pharmaceutical Co., Ltd; Batch number: H20040352). Usage: 5-6 times a d, 1 drop each time. If the symptoms of dry and astringent eyes are relieved, the frequency of medication can be appropriately reduced. The treatment lasted for 1-2 mo. The combined group was treated with pranoprofen combined with sodium hyaluronate eye drops. Observation group-On the basis of the treatment of the control group, the patients were given the external pralofene eye drops (Senju Pharmaceutical Co., ltd. fukusaki plant); Batch number: h20130682), usage: eye drops 4 times a d, 1-2 drops each time. The dosage and frequency should be adjusted according to the remission of dry eye symptoms. After 1-2 mo, the data changes of tear secretion test (Schirmer test) penetration length and tear film break-up time (but) of the two groups before and after treatment were observed[9]. Schirmer test-Under the normal condition without stimulation, a strip filter paper with a width of 5 mm and a length of 35 mm was selected, one end was folded and placed outside the lower eyelid or in the conjunctival sac at 1/3 and the rest was suspended outside the eyelid from the palpebral fissure. During the experiment, the eyes can be opened and the patients can blink at will, but the filter paper should be prevented from falling. BUT test-Before the examination, the patient sat in front of the slit lamp and kept his eyes closed for a period of time. 1 % fluorescein sodium eye drops and under slit lamp with narrow cobalt blue light to and fro carefully observes the tear film in front of the cornea. When black holes such as macular, linear or irregular dry spots appear on the fluorescein stained tear film, the tear film breaks, and the time from blink to black hole appears on the tear film is recorded[8]. After the treatment of dry eye, the data changes of tear secretion test (Schirmer test), tear film but, quality of life and treatment effect were observed: The penetration length of Schirmer test was 10-15 mm, <10 mm was low tear secretion, <5 mm is dry eye; Tear film but: the normal value of tear film but was 15~45 s, <10 s is considered as tear film instability, which needs to be tested three times continuously to get the average value[5]; Quality of life comparison: short form-36 (SF-36) was used to investigate the living conditions of patients after eye drops intervention, including physiological function, physical pain, physiological function, social function and mental health. The full score of each dimension was 100. The higher the score, the higher the quality of life of patients. The difference between the two groups was compared; the clinical effects of the treatment group and the control group were recorded. The clinical efficacy of patients with dry eye is mainly divided into markedly effective, effective and ineffective, the specific ways are as follows: markedly effective: after the treatment of eye drops, the clinical symptoms such as pain, dryness and foreign body sensation disappeared or improved significantly; Effective: after treatment with eye drops, the clinical symptoms such as pain, dryness and foreign body sensation were improved to a certain extent; Invalid: after treatment with eye drops, the clinical symptoms such as pain, dryness and foreign body sensation did not improve or even gradually worsened. Total effective rate= (markedly effective+effective)/total cases×100 %. Statistical package for the social sciences (SPSS) 22.0 software was used for statistical analysis and processing of all data. The count data was expressed as (%) and analyzed with Rank sum test and chi square test. The measurement data was expressed as mean±standard deviation (x±s) and analyzed with t test. $p<0.05$ meant that the difference was statistically significant. According to the analysis of the tear penetration length of the two groups before and after treatment, we found that the wet length of filter paper in the observation group was significantly longer than that in the control group after treatment ($p<0.05$), as shown in Table 1. Based on the comparison of tear film rupture time before and after treatment, we found that the time from blink to tear film rupture in the observation group was significantly longer than that in the control group, as shown in Table 2. We used SF-36 scale to evaluate the quality of life of the two groups of

patients after eye drops intervention and found that the scores of the observation group in the five dimensions of physiological function, physical pain, physiological function, social function and mental health were higher than those of the control group ($p<0.05$), as shown in Table 3. Through the comparative analysis of the clinical treatment effect of the two groups of patients, the total effective rate of the treatment group was 100.00 % and that of the control group was 77.78 %. The total effective rate of the treatment group was significantly higher than that of the control group and the clinical effect of sodium hyaluronate combined with pranoprofen was better ($p<0.05$), as shown in Table 4. With the popularity of all kinds of electronic equipment, people's eye use time and habits gradually form a more obvious change, leading to the continuous increase of dry eye patients. The symptoms of dry eye, such as eye fatigue and foreign body sensation, not only affect the normal use of eyes, but also easily interfere with the quality of life of patients[10,11]. Therefore, it is necessary to choose a reasonable and effective method for treatment. Sodium hyaluronate eye drops, as a common ophthalmic drug, the main component sodium hyaluronate belongs to a class of linear polysaccharides. The mechanism of this drug in the treatment of dry eye mainly includes: Sodium hyaluronate can retain a large amount of water molecules[12]. After frequent use of sodium hyaluronate eye drops in patients with dry eye, the drug can form a good water retention effect, improve dry eye, foreign body sensation and other symptoms; Binding reaction. After the use of sodium hyaluronate eye drops, sodium hyaluronate components can rapidly react with fibronectin, which can stimulate the adhesion and extension of ocular epithelial cells and provide good support for the control of a series of symptoms of dry eye[13,14]. The pharmacological mechanism of anti-inflammatory drug ralofen in the treatment of dry eye is as follows: the volume of tear in patients with dry eye decreases significantly, leading to changes in tear physiological environment. Due to the influence of hypertonic tear film stimulation, a large number of kinases and nuclear transcription factors (mainly acting on conjunctival epithelial cells and tears) with strong stimulation are produced in the eyes of patients[15]. Under the influence of the above stimulation, the concentration of local inflammatory chemokines and inflammatory factors increased significantly, aggravating foreign body sensation, dryness and other symptoms. After the use of pranoprofen eye drops, this non steroidal anti-inflammatory drug can rapidly block the prostaglandin synthesis mechanism, form a good anti-inflammatory effect, reduce the concentration of inflammatory factors and inflammatory chemokines[16], so as to ensure the symptom control effect of patients with dry eye. Once dry eye occurs, it should be treated immediately, which can improve the effectiveness of treatment and save the cost of treatment. In the actual operation, patients can be given pranoprofen eye drops for anti-inflammatory analgesia after the operation, which can reduce the increase of intraocular pressure caused by hormones and reduce the occurrence of adverse reactions. Inform patients of the exact time and dosage of medication, standardize the treatment of patients, and effectively control all aspects, so as to avoid irreversible harm. In this study, Schirmer test and BUT test were used to analyze the effect of pranoprofen combined with sodium hyaluronate on dry eye. Filter paper was used to compare the tear penetration length of the two groups before and after treatment. It was found that pranoprofen combined with sodium hyaluronate eye drops could increase the secretion of tear, keep the eyeball moist, prolong the tear film rupture time, increase the stability of tear film, improve the postoperative quality of life of patients, and reduce the probability of adverse reactions[17,18]. In conclusion, pranoprofen combined with sodium hyaluronate has a very good effect on dry eye after cataract surgery, which can increase tear secretion, keep eyeball moist, improve the stability of tear film and improve the quality of life of patients, which is worthy of wide application and promotion.

TABLE 1: COMPARISON OF PENETRATION LENGTH OF SCHIRMER TEST BETWEEN TWO GROUPS

Group	n	Before treatment (mm)	After treatment (mm)	p
Observation group	36	3.13±1.26	9.91 ±2.33	0.001
Control group	36	3.11±1.28	7.29±1.84	0.001
t		0.737	3.964	
p		0.18	0.001	

TABLE 2: COMPARISON OF TEAR FILM BUT BETWEEN THE TWO GROUPS

Group	n	Before treatment (mm)	After treatment (mm)	p
Observation group	36	5.47±2.36	12.86±2.25	0
Control group	36	5.51±2.38	9.13±2.31	0
t		0.633	4.737	
p		0.389	0	

TABLE 3: COMPARISON OF QUALITY OF LIFE BETWEEN THE TWO GROUPS

Group	n	Somatic function	Psychological function	Social function	Material function	Mental health
Control group	36	58.26±7.3	48.12±6.36	51.35±6.31	61.32±6.74	53.11±2.79
Observation group	36	68.94±7.8	65.24±5.57	63.56±8.44	73.54±7.88	69.57±4.56
t		5.189	9.562	5.162	5.478	14.126
p		0	0	0	0	0

TABLE 4: COMPARISON OF TREATMENT EFFECT BETWEEN THE TWO GROUPS

Group	n	Markedly effective	Effective	Invalid	Total effective rate (%)
Observation group	36	19	17	0	100
Control group	36	9	19	8	77.78
t					10.246
p					0

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Conflict of interests:

The authors report no conflicts of interest.

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