Research Article

Intervention Effect of Traditional Chinese Medicine Hot Pressing Combined with Health Education on the Adolescent’s Visual Fatigue

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1. Introduction

Asthenopia is a syndrome based on the subjective symptoms of the eye and is intertwined with mental (psychological) factors. The patient mainly exhibits decreased persistence of photopic vision and symptoms of eye discomfort (such as swelling, foreign body sensation, and photophobia). It is a common clinical disease in ophthalmology [1]. Eye fatigue is mainly seen in people usually engrossed in watching TV, computers, mobile phones, and other electronic products’ screens, which reduces the blinking rate, resulting in reduced tear secretion. At the same time, flashing screens strongly stimulate the eye and cause the same. Eye fatigue can also cause and aggravate a variety of eye diseases. The best way to relieve eye strain is to rest your eyes. Epidemiological surveys show that [2] the incidence of visual...
fatigue in adolescents in China is increasing, which has a greater impact on their visual function, life, and reading. Traditional Chinese medicine nursing technology is an important method of asthenopia intervention, mainly including traditional Chinese medicine application, fumigation, acupuncture, and ultrasonic atomized eye bath, which can effectively improve the symptoms of asthenopia and has distinct advantages [3–5]. It is mainly due to the teenagers’ paper burden; they currently spend more than ten hours a day in reading. Poor reading posture leads to overcollection of the eye, and the eye overregulates ciliary muscle function during the change in focus, causing ciliary muscle fatigue or causing nerve pain. And lack of exercise, lack of sleep, and other factors can also easily cause eye fatigue.

According to research, traditional Chinese medicine hot pressing combined with local physiotherapy and drug treatment can improve local microcirculation. It has been widely used in joint and coronary treatment. Some scholars’ application of traditional Chinese medicine after radiotherapy showed that traditional Chinese medicine of supplementing qi and promoting blood circulation could not only reduce adverse reactions after radiotherapy but also improve liver microcirculation and provide long-term efficacy of radiotherapy [6, 7]. But there is no report on its application in the intervention of asthenopia. To this end, in order to further explore safe and effective ways to relieve adolescent visual fatigue and analyze the application value of traditional Chinese medicine therapy in this kind of disease, this paper selected 92 adolescent asthenopia patients, using traditional Chinese medicine hot ironing combined with health education for intervention, which is reported in the following.

2. Materials and Methods

2.1. General Information. 92 adolescent asthenopia patients admitted to the outpatient department of Guangming Traditional Chinese Medicine Hospital in Pudong New Area from October 2019 to January 2021 were selected. Inclusion criteria were as follows: Western medicine diagnosis meets the “Chinese Ophthalmology” diagnostic criteria for asthenopia [8]; Chinese medicine diagnosis reference diagnostic criteria for liver and kidney deficiency in “Chinese Medicine Ophthalmology” [9]; age 8–20 years old; no other organic diseases of the eye; and patients or their guardians signed informed consent. Exclusion criteria were as follows: patients with strabismus, glaucoma, and severe dry eye; patients with uveitis, eye infections, and other active eye diseases. Patients were divided into 2 groups by a random number table according to the order of visits. There were 46 cases in the control group, 21 males and 25 females, aged from 10 to 20 (16.38 ± 3.72) years, and the course of disease was 15 days to 24 months, with an average of 8.69 ± 1.25 months; 46 cases in the experimental group, 20 males and 26 females, aged 8–20 (17.34 ± 3.61) years old, the course of illness was 10 days to 22 months, with an average of 8.67 ± 1.08 months. There was no statistically significant difference in gender (t = 0.841, P = 0.506), age (t = 4.30, P = 0.246), and course of disease (t = 0.727, P = 0.431) between the two groups of patients, P > 0.05. All adolescents included in the paper and their guardians signed informed consent forms. The general information and clinical data of all adolescents in the paper were used only for research purposes, not for other purposes.

2.2. Methods. Preparation of traditional Chinese medicine bag: first, processing of traditional Chinese medicine (prescription: dodder, medlar, chrysanthemum, rehmannia, tree peony, yam, poria, and borneol), making 40-mesh granules, and placing them into a 8 × 8 cm nonwoven medicine bag to close the opening; water is sprayed on the surface of the medicine bag twice with a watering can and it is heated in an 800 W microwave oven for 30 seconds to make the temperature of the medicine bag reach 35 ~ 42°C (temperature should be tolerable by the patient).

The traditional Chinese medicine hot ironing: the patient is placed in the supine position, with eyes closed, and ironing with the heated medicine bag on the patient’s eyes is done for 5 min/time, 1 time/d; after hot ironing, sodium hyaluronate eye drops (Qilu Pharmaceutical Co., Ltd., National Medicine Standard H20103633, specification: 5 ml * 0.1%) is given into the conjunctival sac of both eyes in five minutes, 1 drop/time, 3 times/d.

Health education: The health education manual “Core Information on Health Education for the Prevention and Control of Myopia in Children and Adolescents” is distributed to patients, and health guidance is given to patients and their families. 14 days is a course of treatment, with 2 courses of intervention.

Control group: the patients are treated with sodium hyaluronate eye drops for water droplets, cleaned hands, and instilled sodium hyaluronate eye drops (same as above-mentioned) into the conjunctival sac of both eyes, 1 drop/time, 3 times/d, and ”Prevention and Control of Myopia in Children and Adolescents” Health Education Core Information” Health Education Handbook is distributed, which provides health guidance. 14 days is a course of treatment, with 2 courses of intervention.

The specific content of health education is as follows: (1) myopia and amblyopia health education lectures are conducted to students about the harm of myopia, if the corresponding measures are not taken in time, which can develop into amblyopia and miss the best correction period. (2) Several methods of visual acuity correction are introduced, such as optical lens correction, traditional Chinese and western medicine prevention and control, and surgical correction. Among them, the conventional way of optical lens correction is frame glasses, which can improve the refractive error of patients through single-focus frame glasses. Secondly, contact lenses are also a way of optical lens correction, and compared with framed glasses, they have the advantages of a wide field of vision, small imaging ratio, no blind area, and low difference. Western medicine uses atropine and other anticholinergic drugs, through paralysis ciliary muscle to achieve effective regulation of the eye. (3) In class and between classes, students’ reading and writing posture, eye movement, and other movements should be
standardized and checked, the bad reading and writing posture of teenagers should be corrected in time, and teachers’ eye movement guidance should be strengthened to better standardize teenagers’ movements. And imposed rules to prevent myopia in the class are as follows: less exposure to computers and television; keeping one foot distance between the table and the glasses; adjusting the sleep time; ensuring that the glasses get enough relaxation; and avoiding wiping your eyes with germy hands.

In the satisfaction survey, oral inquiry was used to record the attitude of each patient in detail, including five items of “very dissatisfied,” “dissatisfied,” “uncertain,” “satisfied,” and “very satisfied.” Satisfaction rate = (very satisfied number + satisfied number)/total number × 100%. The rating scale was used to assess the degree of visual fatigue by a questionnaire, including whether there was easy drowsiness, inattention, eye fatigue, eye pain, and other phenomena when reading or working in close proximity. According to the rating rate, it was divided into never, sometimes, and frequent, and the scores were 0, 1, and 3, respectively. The scale score ranges from 0 to 15, and the higher the score, the higher the degree of visual fatigue.

Observation indicators refer to the “Diagnosis and Curative Effect Standards for Diseases and Syndromes of Traditional Chinese Medicine” [10], and Xiang et al. [11] reported to develop asthenopia symptom scoring standards for patients with impatience, sore eyes, dry eyes, and orbital eyebrow swelling pain. TCM clinical symptoms such as headache and general malaise are classified and quantitatively scored: 0 points: asymptomatic; 1: occasional (1 week ≤ 3 times); 2: frequent (1 week > 3 times); and 3 points: continuous (every day); before the intervention, after one course of intervention, and at the end of the intervention were scored. The clinical efficacy was evaluated according to the reduction of the total symptom score before and after the intervention. Recovery: the reduction of the symptom score was ≥95%; markedly: the reduction of the symptom score was 70% to 95%; effective: the reduction of the symptom score was 30% to 69%; and ineffective: the reduction of the symptom score was less than 30%. Symptom score reduction = (1 – score after treatment/total score before treatment) × 100%. The total effective rate is the sum of the cure rate, the apparent rate, and the effective rate. Before and after the intervention, rapid mydriatic computer optometry was used to determine the left and right eye dioptr.

In this paper, SPSS 22.0 was used for analysis. Measurement data are expressed as the mean ± standard deviation (X ± s), using the t-test; counting data are expressed as (n (%)), using the χ² test, with P < 0.05 means that the difference is statistically significant.

3. Results

3.1. Comparison of the Scores of Asthenopia before and after the Intervention between the Two Groups. There was no significant difference in the scores of asthenopia before the intervention between the two groups (P > 0.05). After the intervention, the scores of asthenopia symptoms in the control group and the test group were both reduced (P > 0.05). In the control group: t = 4.167 and 6.318, P = 0.027 and 0.010; in the test group: t = 4.820 and 6.834, P = 0.013 and <0.001; the scores of asthenopia symptoms in the first and second courses of the test group after intervention were significantly lower those in the control group (P < 0.05). Table 1 shows the comparison of visual fatigue symptom scores between the control group and the experimental group before and after intervention.

3.2. Comparison of Clinical Efficacy between the Two Groups. The total clinical effective rate of the test group is 93.48%, which is significantly higher than that of the control group (80.43%). The difference between the groups is statistically significant (P < 0.05). Table 2 presents the comparison of clinical efficacy between the control group and the experimental group after intervention.

3.3. Comparison of the Refractive Power of the Two Groups of Eyes before the Intervention. There was no statistically significant difference in the refractive power of the left and right eyes of the two groups of patients before the intervention (P > 0.05). Both were significantly reduced (P < 0.05). After the intervention, the difference in the refractive power of the left and right eyes between the two groups was statistically significant (P < 0.05). Table 3 shows a comparison of the results of eye refractive examination between the control group and the experimental group before and after intervention.

3.4. The Scores of Asthenopia of the Two Groups Were Compared before and 6 Months after Intervention. The results showed that the scores of asthenopia in both groups changed in 6 months, but the scores of asthenopia in the control group were significantly higher than those in the test group (P < 0.05). Table 4 shows the scores of asthenopia of the two groups compared before and 6 months after intervention.

4. Discussion

Asthenopia is an ophthalmological disease induced by long-term use of the eyes, and adolescents are the high-risk population of this disease [12]. At present, Western medicine mainly focuses on the symptomatic treatment of eye fatigue. The main methods include the removal of inducements, topical antibiotics, and artificial eye drops. For teenagers, it is difficult to remove inducements due to the needs of learning. However, topical eye medication can only be relieved in a short period of time. The disease is easy to relapse. The symptoms are not the root cause. And it will damage the ocular surface in long term [13]. In recent years, local traditional Chinese medicine interventions such as traditional Chinese medicine fumigation, traditional Chinese medicine iontophoresis, and traditional Chinese medicine eye hot ironing have achieved remarkable results in improving the symptoms of patients’ asthenopia and improving the treatment efficiency [14]. To this end, this paper is based on the overall concept and the concept of
syndrome differentiation and treatment, using traditional Chinese medicine hot press to intervene in the asthenopia of adolescents, in order to provide a more effective method for clinical intervention of asthenopia.

The results of the hot ironing of traditional Chinese medicines selected in this paper showed that the scores of asthenopia symptoms of the control group and the test group after the intervention were reduced after 1 and 2 courses of treatment, and the scores of asthenopia symptoms of the 1 and 2 courses of the test group were significantly lower than those of the control group after the intervention. The total clinical effective rate of the test group was 93.48%, which was significantly higher than that of the control group (80.43%). The difference between the groups was statistically significant ($P < 0.05$), suggesting that the combination of traditional Chinese medicine hot pressing and health education can significantly improve the symptoms of adolescent eyestrain and enhance the clinical treatment effect. Traditional Chinese medicine classifies asthenopia in the category of “liver work.” Adolescents’ asthenopia is mostly caused by heavy learning burdens, long-term papers at the desk, excessive use of eyes, lack of exercise, and lack of sleep. The tendon meridian is elongated but not relaxed, and the blood essence of the liver and kidney is insufficient. The depletion of essence and blood and the loss of muscle nutrition are closely related to the blood deficiency of liver and kidney meridians [15, 16]. Therefore, adolescent patients with visual fatigue often show symptoms of stagnation of meridians and loss of qi and blood. Therefore, the intervention of adolescents’ visual fatigue should be carried out to nourish the liver and kidney, relax the meridians, and activate the collaterals. The classic prescriptions selected in this paper are mainly composed of dodder, wolfberry, chrysanthemum, etc. The classic prescription itself has the effects of nourishing the liver and kidney, nourishing essence and blood, and can directly act on the eyeball and its appendages with the help of traditional Chinese medicine hot blanching technology. The tissues can regulate the local qi and blood of the eye, nourish the liver and kidney, relax the meridians, relieve fatigue, and improve eyesight. The borneol in the prescription can increase the penetration of other drugs in the eye, nourish the liver and kidney, relax the meridians, and activate the collaterals.

Table 1: Comparison of visual fatigue symptom scores between the control group and the experimental group before and after intervention (±s, points).

| Group          | Number | Before intervention | After intervention for 1 course of treatment | After intervention for 2 course of treatment |
|----------------|--------|---------------------|---------------------------------------------|---------------------------------------------|
| Control group  | 46     | 14.35 ± 3.27        | 8.94 ± 1.20*                                | 6.61 ± 0.95*                                |
| Test group     | 46     | 14.62 ± 3.22        | 7.30 ± 1.15*                                | 4.50 ± 0.82*                                |
| T value        | 0.751  | 4.617               | 5.039                                       |                                             |
| P value        | 0.240  | 0.031               | 0.016                                       |                                             |

Note. Compared with before intervention, *$P < 0.05$.

Table 2: Comparison of clinical efficacy between the control group and the experimental group after intervention (case (%)).

| Group          | Number | Cure | Markedly effective | Effective | Invalid | Total effective rate |
|----------------|--------|------|--------------------|-----------|---------|----------------------|
| Control group  | 46     | 2 (4.35) | 10 (21.74)        | 25 (54.35) | 9 (19.57) | 37 (80.43)         |
| Test group     | 46     | 6 (13.04) | 17 (36.96)       | 20 (43.48) | 3 (6.52)  | 43 (93.48)         |

$\chi^2$ 4.453

$P$ 0.036

Table 3: Comparison of the results of eye refractive examination between the control group and the experimental group before and after intervention (±s, D).

| Group          | Number | Left eye diopter | Right eye diopter |
|----------------|--------|------------------|-------------------|
|                | Before intervention | After intervention | Before intervention | After intervention |
| Test group     | 46     | −1.79 ± 0.31     | −1.65 ± 0.26      | −1.73 ± 0.29       | −1.60 ± 0.20       |
| Control group  | 46     | −1.81 ± 0.28     | −1.05 ± 0.18*     | −1.75 ± 0.30       | −1.03 ± 0.16*      |
| $t$ value      | 0.726  | 4.824            | 0.95              | 4.308              |
| $P$ value      | 0.312  | 0.027            | 0.506             | 0.041              |

Note. Compared with before intervention, *$P < 0.05$.

Table 4: The scores of asthenopia of the two groups were compared before and 6 months after intervention (±s, points).

| Group          | Number | Before the intervention | Six months after intervention | $t$ value | $P$ value |
|----------------|--------|-------------------------|------------------------------|-----------|-----------|
| Control group  | 46     | 6.61 ± 0.95             | 7.03 ± 0.52                 | −2.630    | 0.010     |
| Test group     | 46     | 4.50 ± 0.82             | 4.74 ± 0.73                 | −1.183    | 0.142     |
patients’ awareness of using their eyes scientifically, improve bad eye habits, remove incentives to a certain extent, allow the eyes to be fully rested, and regulate the symptoms of asthenopia. In addition, the results of this paper showed that there was no significant change in the refractive power of the left and right eyes of the control group before and after the intervention ($P > 0.05$). After the intervention, the refractive power of the left and right eyes of the paper group was significantly reduced ($P < 0.05$). After the intervention, the differences in the refractive powers of the left and right eyes of the two groups were statistically significant. It is suggested that the traditional Chinese medicine hot ironing can improve the eyesight of the patients. In addition, there were no adverse reactions in the two groups in this paper, but during the implementation of hot ironing, more communication should be made with the patient, and the hot ironing temperature should be adjusted according to personal sensitivity to avoid skin burns.

5. Conclusion

In conclusion, the traditional Chinese medicine ironing combined with health education intervention can improve the symptoms of adolescents’ visual fatigue and improve the treatment efficiency. The method is safe, and the operation is convenient. It is worthy of clinical promotion.

In addition, the satisfaction rate of the experimental group was significantly higher than that of the control group. It shows that Chinese medicine therapy is satisfied with teenagers and parents because of its simple and comfortable operation, no adverse side effects, and high curative effect [18, 19]. In addition, although this paper has achieved some results, there are still some limitations [20, 21]. First of all, the sample size of this paper is too small, and the selection scope is relatively concentrated, which cannot represent the vast area of teenagers. Therefore, the sample size should be further expanded in the next paper, and representative samples should be selected from all parts of the country to make the research results more rigorous and representative [22–24]. Secondly, this paper conducted a follow-up investigation on the vision changes of adolescents in the next 6 months and showed that the combination of TCM hot pressing and health education had a good effect in the short term, but the long-term efficacy has not been studied yet. Therefore, the follow-up time will be extended in the next paper to observe the long-term efficacy of this therapy.

Data Availability

The simulation experiment data used to support the findings of this paper are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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