Literature Study

Analysis of point-selection pattern in acupuncture-moxibustion treatment of amblyopia

针灸治疗弱视的选穴规律分析

Cao Zhao-xia (曹朝霞)^{1,2}, Liu An-guo (刘安国)¹, Yan Xing-ke (严兴科)¹, Li Xiao-juan (李小娟)¹ 1 Gansu University of Chinese Medicine, Lanzhou 730000, China

2 Dazhou Hospital of Integrated Chinese and Western Medicine, Sichuan Province, Dazhou 635000, China

Abstract

Objective: To analyze and summarize the characteristics and pattern in the selection of points and meridians by searching the clinical research literature about acupuncture-moxibustion treatment of amblyopia in the recent 17 years.

Methods: By searching Chinese and English databases, such as China National Knowledge Infrastructure (CNKI), PubMed, etc., the points in 52 articles in conformity with the requirements were analyzed by frequency statistics by the order of meridians, major points, and adjunct points to summarize the rules and characteristics of the point selection.

Results: In 52 articles, there were 21 articles on ear acupuncture and 31 articles on acupuncture-moxibustion treatment. Ten meridians were involved in acupuncture-moxibustion treatment of amblyopia, and the leading 3 meridians were the Bladder, Stomach and Gallbladder Meridians. There were 34 points, 10 extraordinary points and 37 ear points were used in acupuncture-moxibustion treatment of amblyopia. The top 10 major points were Jingming (BL 1), Taiyang (EX-HN 5), Cuanzhu (BL 2), Fengchi (GB 20), Baihui (GV 20), Hegu (LI 4), Guangming (GB 37), Sibai (ST 2), Chengqi (ST 1) and Sizhukong (TE 23). The top 5 adjunct points were Zusanli (ST 36), Shenshu (BL 23), Ganshu (BL 18), Sanyinjiao (SP 6) and Taixi (KI 3).

Conclusion: Acupuncture-moxibustion treatment of amblyopia is characterized by the selection of the points mainly from yang meridians, based upon syndromes differentiation plus personal experience, and the points mainly around the eyes and by stressed use of ear points.

Keywords: Acupuncture-moxibustion Therapy; Acupuncture Therapy; Moxibustion Therapy; Acupuncture, Ear; Auricular Point Sticking; Amblyopia; Point Selection; Point Combination

【摘要】目的:检索近17年来针灸治疗弱视的临床研究文献,对针灸治疗弱视的选穴用经特点和规律进行分析和 总结。方法:通过检索中国知网(CNKI)、PubMed 等中英文数据库,采用频数统计的方法对筛选出的符合要求的 52 篇文献中的腧穴按照归经、主穴、配穴进行频数统计分析,总结选穴规律及特点。结果:在52 篇文献中,以 耳穴治疗为主的文献有 21 篇,针灸治疗 31 篇;针灸治疗弱视涉及 10 条经脉,以膀胱经、胃经和胆经为主;涉及 34 个经穴、10 个常用奇穴和 37 个耳穴。主穴使用频次居前十位的腧穴依次为睛明、太阳、攒竹、风池、百会、 合谷、光明、四白、承运和丝竹空。配穴使用频次居前五位的腧穴依次为:足三里、肾俞、肝俞、三阴交和太溪。 结论:针灸治疗弱视具有选经以阳经取穴为主,辨证取穴结合经验配穴,选穴以眼周为主,重用耳穴的特点。

【关键词】针灸疗法;针刺疗法;灸法;耳针;耳穴贴压;弱视;选穴;配穴法

【中图分类号】R246.8 【文献标志码】A

Amblyopia is a disorder of sight due to refers to interactions of the two eyes or sufficient visual deprivation during the critical period of visual development. It causes a decrease in vision in one or both eyes with no apparent structural abnormality. The best corrected vision is still less than $0.9^{[1-2]}$. In China, amblyopia affects 0.81%-2.80% of children^[3-4]. Modern treatment methods include patching (occlusion), penalization, levodopa, or laser eye surgery. However, children may not respond well to these therapies due to

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their poor compliance and adverse reactions of levodopa or surgery^[5]. Acupuncture is widely used for the treatment of amblyopia because of its reliable efficacy, easy operation and fewer side effects^[6-8]. This paper analyzes the points used for amblyopia and point-combination pattern in acupuncture literature over the past 17 years and aims to provide valuable reference for future treatment in this regard.

1 Data and Methods

1.1 Data sources

Domestic databases: China National Knowledge Infrastructure (CNKI), Chongqing VIP Database (CQVIP),

Author: Cao Zhao-xia, master degree candidate of grade 2016 Corresponding Author: Yan Xing-ke, professor, doctoral supervisor. E-mail: yanxingke@126.com

Wanfang Academic Journal Full-text Database (Wanfang), and Chinese Biomedical Literature Database (CBM).

Overseas databases: PubMed, Cochrane Library (Cochrane), and Excerpta Medica Database (EMBASE).

Search time: Between January 1, 2000 and March 31, 2017.

1.2 Search terms

Amblyopia, acupuncture-moxibustion, acupuncture, moxibustion, electroacupuncture, plum-blossom needle, auricular point, ear acupuncture, points, etc.

1.3 Inclusion criteria

Confirmed diagnosis of amblyopia; major points mainly from the fourteen meridians, extraordinary points and ear points, with the therapies of acupuncture, moxibustion, electroacupuncture, plum blossom puncture and ear acupuncture, treatment of amblyopia by single therapy or plus other methods; precise selection of points; definitive criteria for assessment of therapeutic effects; one latest-published article in the similar articles of the same author.

1.4 Exclusion criteria

Literatures of review, general summary and expert's comments; literatures of animal experiment or mechanism study; and literatures without concrete points in the treatment.

1.5 Statistical management

After Excel tables were established, the points of the

collected literatures were categorized statistically by meridian, major points, adjunct points and ear points, and respectively recorded with their frequency. The frequency of the collected points was statistically analyzed by frequency statistics, to sum up the pattern of the point selection and draw up the tables.

2 Results

2.1 Results of literature search

In accordance with the above methods, totally 121 relevant articles were collected. After screening, 52 articles were in conformity with the inclusive criteria, in which there were 21 articles on treatment by ear acupuncture, and 31 articles on treatment by non-ear acupuncture.

2.2 Point-selection and meridian

It can be seen from Table 1 that in 31 articles of nonear acupuncture, acupuncture-moxibustion treatment of amblyopia involved 10 meridians, and 10 commonlyused extraordinary points. Totally 44 points at 217 times of frequency involved, including 159 times of frequency in major points and 58 times of frequency in adjunct points. The meridians with most points used were the Bladder Meridian of Foot Taiyang (8 points), the Stomach Meridian of Foot Yangming (6 points), Governor Vessel (5 points), and the Gallbladder Meridian of Foot Shaoyang (4 points), (Table 1).

Meridian/extraordinary point	Number	Points and frequency (time)		
Bladder Meridian	8	Jingming (BL 1) (17), Cuanzhu (BL 2) (13), Chengguang (BL 6) (2), Tianzhu (BL 10) (1), Ganshu (BL 18) (9), Shenshu (BL 23) (8), Pishu (BL 20) (3), Fuyang (BL 59) (2)		
Stomach Meridian	6	Chengqi (ST 1) (10), Sibai (ST 2) (9), Xiaguan (ST 7) (1), Zusanli (ST 36) (7), Touwei (ST 8) (5), Juliao (ST 3) (1)		
Gallbladder Meridian	4	Fengchi (GB 20) (16), Guangming (GB 37) (10), Tongziliao (GB 1) (2), Yangbai (GB 14) (1)		
Large Intestine Meridian	3	Hegu (LI 4) (13), Quchi (LI 11) (1), Binao (LI 14) (1)		
Triple Energizer Meridian	3	Sizhukong (TE 23) (8), Waiguan (TE 5) (1), Yifeng (TE 17) (2)		
Spleen Meridian	2	Sanyinjiao (SP 6) (6), Taibai (SP 3) (1)		
Liver Meridian	1	Taichong (LR 3) (3)		
Kidney Meridian	1	Taixi (KI 3) (4)		
Pericardium Meridian	1	Neiguan (PC 6) (3)		
Governor Vessel	5	Yintang (GV 29) (3), Dazhui (GV 14) (2), Baihui (GV 20) (12), Shangxing (GV 23) (1), Fengfu (GV 16) (1)		
Extraordinary points	10	Yuyao (EX-HN 4) (5), Taiyang (EX-HN 5) (16), Qiuhou (EX-HN 7) (5), Yiming (EX-HN 14) (6), Cervical Jiaji (EX-B 2) (1), Xinming (Extra) (1), Yandian (Extra) (1), Shibai (Extra) (1), Zhengguang1 (Extra) (1), Zhengguang 2 (Extra) (1)		
Total	44	217		

Table 1. Points, meridians and frequency

2.3 Major and adjunct points

In 31 articles of non-ear acupuncture, the top 10 major points in frequency were Jingming (BL 1) (17 times), Taiyang (EX-HN 5) (15 times), Cuanzhu (BL 2) (13 times), Fengchi (GB 20) (13 times), Baihui (GV 20) (11 times), Hegu (LI 4) (10 times), Guangming (GB 37) (9 times), Sibai (ST 2) (9 times), Chengqi (ST 1) (9 times) and Sizhukong (TE 23) (8 times). The top 5 adjunct points in frequency were Zusanli (ST 36) (8 times), Shenshu (BL 23) (8 times), Ganshu (BL 17) (7 times), Sanyinjiao (SP 6) (4 times) and Taixi (KI 3) (4 times).

In 31 articles of non-ear acupuncture, the high percentage in the total frequency of the major points was extraordinary points (34 times), points of Bladder Meridian (36 times), Gallbladder Meridian (25 times),

Table 2.	Number	of	points	and	their	frequency

and Stomach Meridian (23 times). The high percentage in the total frequency of the adjunct points was Bladder Meridian (19 times), Stomach Meridian (10 times), Large Intestine Meridian (5 times) and Spleen Meridian (5 times). The high percentage in the total frequency of the adjunct points was Bladder Meridian (55 times), extraordinary points (41 times), Stomach Meridian (33 times) and Gallbladder Meridian (29 times), (Table 2). 2.4 Ear points

In 21 articles of treatment by ear points, totally 37 ear points were involved (161 times). The ear points with the using frequency larger than 30% were Kidney (CO_{10}) (100.0%), Liver (CO₁₂) (90.5%), Eye (LO₅) (80.9%), Eye 1 (TG₂) (57.1%), Eye 2 (AT₁) (57.1%), Heart (CO₁₅) (42.8%) and Spleen (CO₁₃) (33.3%), (Table 3).

Meridian/extraordinary points	Number	Major points frequency [time (%)]	Adjunct points frequency [time (%)]	Total points frequency [time (%)]
Bladder Meridian	8	36 (22.6)	19 (32.8)	55 (25.3)
Stomach Meridian	6	23 (14.5)	10 (17.2)	33 (15.2)
Gallbladder Meridian	4	25 (15.7)	4 (6.9)	29 (13.4)
Large Intestine Meridian	3	10 (6.3)	5 (8.6)	15 (6.9)
Triple Energizer Meridian	3	9 (5.7)	2 (3.4)	11 (5.1)
Spleen Meridian	2	2 (1.3)	5 (8.6)	7 (3.2)
Liver Meridian	1	0 (0)	3 (5.2)	3 (1.4)
Kidney Meridian	1	0 (0)	4 (6.9)	4 (1.8)
Pericardium Meridian	1	3 (1.9)	0 (0)	3 (1.4)
Governor Vessel	5	17 (10.7)	2 (3.4)	19 (8.8)
Extraordinary points	10	34 (21.4)	4 (6.9)	38 (17.5)
Total	44	159 (100)	58 (100)	217 (100)

Table 3. Ear	points in using	frequency	larger than 30%

Points	Frequency (time)	Percentage of total ear points (%)	Frequency (%)
Kidney (CO ₁₀)	21	13.0	100.0
Liver (CO ₁₂)	19	11.8	90.5
Eye (LO ₅)	17	10.6	80.9
Eye 1 (TG ₂)	12	7.6	57.1
Eye 2 (AT_1)	12	7.6	57.1
Heart (CO ₁₅)	9	5.6	42.9
Spleen (CO ₁₃)	7	4.3	33.3

3 Analysis of the Pattern in the Point-selection

Amblyopia is a common ophthalmic disease in children. Although the patients with amblyopia have no organic lesions in the eyes, the vision after correction is still lower than that of the children at the same age. Amblyopia can be divided into strabismic amblyopia,

anisometropic amblyopia, ametropic amblyopia, and form deprivation amblyopia^[9].

There was no term of amblyopia in the classical literature of traditional Chinese medicine. Based upon the clinical manifestations, it can be categorized into the scope of 'blurry vision' and 'glaucoma', and is mostly caused by deficiency of the liver and kidney due to prenatal insufficiency or postnatal malnutrition due to deficiency of the spleen and stomach, or failure in treatment or error in the treatment^[10]. The points in the literatures collected for this study were categorized and summarized by the proper order of meridian, major and adjunct points, showing that the selection of points in acupuncture-moxibustion treatment of amblyopia was characterized by 4 aspects.

3.1 Points predominantly from yang meridians

It has been shown in the analysis of the literatures that amblyopia was mainly treated by the points from yang meridians, predominantly from the Bladder, Stomach and Gallbladder Meridians. Because the pathways of those three meridians are closely related to the eye system, the stimulation to the points on those three meridians can be used for the diseases of the eyes. The points in the top three of the frequency were respectively from the Bladder, Stomach and Gallbladder Meridians. Ge HL, *et al*^[11], reported that in the treatment of intractable amblyopia by mainly the points from the Bladder, Gallbladder and Stomach Meridian, the total effective rate was 100% for amblyopia after cataract surgery and anisometropic amblyopia.

3.2 Points mainly around the eyes, plus holistic consideration

It has found out in this study that the points used most frequently for amblyopia did not belong to the fourteen meridians, but were the extraordinary points distributed around the eyes. Generally, the extraordinary points are developed from Ashi points^[12]. Qiuhou (EX-HN 7) and Yuyao (EX-HN 4) are located around the eyes, distributed with many arterial branches in the deep layer. Blood circulation in the ocular region mainly comes from the ocular arteries. Acupuncture can dilate the local blood vessels, speed up blood flow and accelerate the local metabolism, so as to treat amblyopia^[13]. Since the ancient times, Jingming (BL 1) around the eye had been extensively used in treatment of amblyopia^[14]. Distributed with the ophthalmic nerves in the deep layer^[15], Jingming (BL 1) was combined with various points for directly regulating the meridian qi of the eyes^[16]. Taiyang (EX-HN 5), adjacent to the branch of the trigeminal nerve and oculomotor nerve, is a commonly used point for diseases in the ocular region^[17-18]. Cuanzhu (BL 2) is mainly used to treat ocular diseases and forehead pain, and can be used to brighten the eyes, if it is combined with Fuyang (BL 59). Zhao JH, et al^[19], achieved satisfactory therapeutic results in the treatment of amblyopia in children by selecting Cuanzhu (BL 2) in combination with Fuyang (BL 59), and Hegu (LI 4) with Fuyang (BL 59), based upon the theory of combination of remote and adjacent points and the points in the lower body for problems in the upper body.

3.3 Points selection by pattern identification plus combination of points by experience

Amblyopia is mostly caused by essence deficiency of the liver and kidney, essence deficiency and shortage of blood, or insufficiency of natural endowment, postnatal malnutrition, or failure in treatment or error in the treatment, and its pathogenesis is mainly related to deficiency. Therefore, clinically, Fengchi (GB 20), Chengqi (ST 1), Baihui (GV 20), Zusanli (ST 36), Hegu (LI 4), Ganshu (BL 18), Pishu (BL 20), and Shenshu (BL 23) could be selected for pathogenesis, in combination with empirical points such as Zhengguang 1 (Extra), Zhengguang 2 (Extra), Xinming (Extra), and Yandian (Extra), jointly for treating amblyopia. J. Acupunct. Tuina. Sci. 2018, 16(2): 127-132

and Yang Link Vessel, and links with the collaterals of the eyes. Acupuncture at Fengchi (GB 20) can dredge the collaterals of the eyes, clear and benefit the head and eyes. It has been proven that acupuncture at Fengchi (GB 20) has an obvious improving effect on the excitability of the cerebral cortex^[20]. Miao CY, et al^[21], treated amblyopia in children of high age by heat-sensitive moxibustion at Fengchi (GB 20) and the total effective rate was 85.1%. In combination of Fengchi (GB 20) and Chengqi (ST 1), essence of the spleen and stomach could be guided to flow upward and nourish the eyes, and ensure the healthy transportation of the spleen and stomach, sufficiency in production of gi and blood, exuberance of essence and blood in the liver and kidney, and smooth flow of the meridians, so as to nourish the ocular system. Baihui (GV 20) is located at the vertex and can be used to regulate yang qi of the whole body. Zusanli (ST 36), the Lower He-Sea point, is a healthcare point. Acupuncture at Zusanli (ST 36) can be used to reinforce the spleen and benefit the stomach, and strengthen the source of qi and blood production^[22]. Hegu (LI 4) is the Yuan-Primary point of the Large Intestine Meridian of Hand Yangming. Acupuncture at Hegu (LI 4) can be used to regulate qi and blood, nourish blood, dredge the collaterals and brighten the eyes. Ganshu (BL 18), Pishu (BL 20) and Shenshu (BL 23), as Back-Shu points, can be used to regulate the liver and nourish blood, reinforce the spleen and benefit the kidney. As an effective point to brighten the eyes, Ganshu (BL 18) is also able to regulate the liver to brighten the eyes^[23]. The above points in combination can improve the circulation of gi and blood in the eyeballs and surrounding tissues, and dredge the collaterals of the ocular fundus, so as to transport the essential gi of five Zang and six Fu organs to the eyes for treating amblyopia. Lin ZH, et al^[24], punctured Ganshu (BL 18) and Shenshu (BL 23) for treating the patients with amblyopia and the effective rate was 100%.

Zhengguang 1 (Extra), Zhengguang 2 (Extra), Xinming (Extra) and Yandian (Extra) are the frequently-used empirical points. Zhengguang 1 (Extra) and Zhengguang 2 (Extra) are located in the ocular region and have the effects to brighten the eyes^[6]. Xinming (Extra), an empirical point innovated in 1980s^[25], has the effects to regulate the meridian qi of the ocular region, accelerate blood circulation of the ocular region, improve nutrition of the ocular nerves and is mainly used for treating diseases in the ocular region. Yandian (Extra) is located in the ear lobe and is stimulated to dredge the meridians and collaterals, and regulate and harmonize qi and blood, so as to improve the vision of the patients with amblyopia.

3.4 Emphasis on ear points

It has been found out in this study that in 52 articles in conformity with the inclusion criteria, 21 articles were the literatures about ear acupuncture, accounting for 40% of the selected literatures. It could be seen that ear points were significant in the treatment of amblyopia.

It is believed in Chinese medicine that the ear is most densely distributed with the meridians and collaterals. Twelve meridians and three hundred and sixty five collaterals all go through the ear. It has been proven by the study that oppression on the ear points can regulate the physiological functions of the human organs. Seed-embedding method at ear points can stimulate the nervous pathways of the lymphatic vessels, blood vessels and nerves of the ocular region, so as to improve the functions of the organs^[26]. The selection of ear points is mainly focused on Liver (CO₁₂), Kidney (CO₁₀), Eye (LO₅), Heart (CO₁₅), Eye 1 (TG₂), Eye 2 (AT₁), and Spleen (CO₁₃). Among them, Heart (CO₁₅), Liver (CO₁₂) and Kidney (CO₁₀) can regulate qi and blood, and dredge the meridians. The spleen dominates the muscles. Therefore, stimulation on Spleen (CO₁₃) is able to improve the vision. Eye (LO₅), Eye 1 (TG₂) and Eye 2 (AT_1) are the corresponding points of the eye and are able to dredge the meridians and improve the vision by stimulation.

The commonly used herbal product for earembedding method is *Wang Bu Liu Xing* (*Semen Vaccariae*)^[27] and Er Xue Zeng Shi Dan (Ear Point Visionincreasing Pills)^[28]. Liu HY^[29] treated 65 children with amblyopia by embedding the herbal seeds at ear points and the total effective rate was 97%. Miao CY, *et al*^[30], treated amblyopia by applying round magnetic steel sheet, in diameter of 4 mm and 3 000 Gauss of surface magnetic field strength, to the bilateral ear points of Eye (LO₅), Liver (CO₁₂), Spleen (CO₁₃), Central Rim (AT_{2,3,4i}), Subcortex (AT₄) and Sympathetic (AH_{6a}), by stimulating the ear points with magnetic stimulation and pressure from suction of the two pieces of magnetic sheets, and the total effective rate was 90.3%, without adverse reactions.

4 Summary

It can be seen from the findings of this study that the selection of the points in acupuncture-moxibustion treatment of amblyopia reflects the holistic concept and therapy based upon pattern identification in traditional Chinese medicine, and the point-selecting pattern of the selection of the local points, plus the selection of the points by holistic consideration, the selection of the points based upon pattern identification, and the combination of the points based upon experience, in order to strengthen the spleen and circulate qi, reinforce and benefit the liver and kidney, dredge the eye collaterals, clear the head and eyes, and harmonize yin and yang, so as to realize the goal to treat amblyopia.

Conflict of Interest

The authors declared that there was no potential conflict of interest in this article.

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Translator: Huang Guo-qi (黄国琪)