DOI: 10.53469/jcmp.2025.07(07).40

Research Progress on Acupuncture Treatment for Cognitive Impairment after Stroke

Nan Bai[1], Tianhong Ding[2,*], Running Zhang[2]

[1]Shaanxi University of Chinese medicine, Xianyang 712046, Shaanxi, China
[2]The Second Affiliated Hospital of Shaanxi University of Chinese medicine, Xianyang 712046, Shaanxi, China
**Correspondence Author*

Abstract: ***By reviewing the past 5 years of acupuncture alone and acupuncture combined with other therapies, such as: Clinical research on the treatment of post-stroke cognitive impairment by acupuncture and drug combination,, acupuncture combined rehabilitation therapy and other therapeutic methods to study the mechanism of action,, point selection rules and efficacy of acupuncture in the treatment of post-stroke cognitive impairment,, so as to guide the clinical treatment of acupuncture in the treatment of post-stroke cognitive impairment and confirm the authenticity and effectiveness of acupuncture in the treatment of post- stroke cognitive impairment.***

Keywords: Prick, Cognitive impairment after stroke, Clinical research, Curative effect**.**

1. Introduction

Post-stroke cognitive impairment (PSCI) refersto a series of symptoms that occur within six months after a stroke and can meet the diagnostic criteria for cognitive impairment. PSCI encompasses cognitive impairment caused by stroke events such as multiple infarctions, key infarction sites, subcortical ischemic infarction, and cerebral hemorrhage, as well as cognitive impairment resulting from the progression of brain degenerative diseases like Alzheimer's disease (AD) within 6 months after stroke. Song Haiqing [1] et al. 's research shows that after the first ischemic stroke in China, the high incidence of SCI, advanced age, living area and low educational level are three common risk factors for PSCI. PSCI thas a significant impact on the quality of life of stroke patients, and in severe cases, they may lose their ability to take care of themselves. The methods for treating PSCI in Western medicine are limited. Acupuncture, as a traditional Chinese medical therapy, has significant advantages in treating cognitive impairment.

2. The Understanding of the Pathogenesis of Cognitive Impairment after Stroke in Traditional Chinese Medicine

Post-stroke cognitive impairment falls under the category of "dementia" in traditional Chinese medicine. Its important pathological factors are no more than "qi", "fire", "phlegm" and "blood stasis". The location of the disease is in the brain, involving the liver, spleen and kidneys. The pathogenesis of cognitive impairment after stroke is closely related to the pathogenesis of stroke. Stroke can lead to the reduction of the marrow and brain in patients, and the reduction of the marrow and brain is the fundamental pathogenesis of PSCI. Phlegm and blood stasis are not only the initiating factors but also the long-term pathological products of this disease. Pathological products caused by qi deficiency and qi stagnation: The presence of phlegm and blood stasis can cause long-term obstruction of the brain meridians, leading to the loss of the vital energy and aggravation of PSCI. Qi deficiency and qi stagnation are attributed to the deficiency of primordial qi, qi deficiency of the spleen and stomach, and liver depression and qi stagnation. The spleen and stomach are the source of qi and blood production and the foundation of the body after birth. When the spleen and stomach are deficient, the production of qi and blood is insufficient. As the Ling Shu: Oral Inquiry states, "When the upper qi is insufficient, the brain is not satisfied." The spleen and stomach simultaneously transform and transport body fluids from food and water. When the qi of the spleen and stomach is weak and their transformation and transportation are insufficient, it will lead to pathological factors such as the formation of phlegm and blood stasis due to the obstruction of body fluids. The liver governs the free flow of qi and also regulates the smooth flow of qi. If the liver's function of regulating the free flow of qi and the smooth flow of qi is impaired, the transformation and transportation functions of the spleen and stomach will also be impaired, which will lead to qi stagnation. Qi can promote blood circulation. When qi stagnation is blocked, blood circulation is impeded. If the circulation of qi and blood is not smooth, the brain meridians will not be able to flow smoothly. The kidney is the foundation of the innate constitution. When the foundation of the innate constitution is damaged, the divine mechanism will be unable to function.

In conclusion, the functions of the spleen, stomach, liver and kidneys are closely related to the occurrence and development of PSCI. Functional disorders of the spleen, stomach, liver and kidneys can affect the production and circulation of qi and blood. Impaired production and circulation of qi and blood can lead to brain depletion and marrow reduction, and at the same time produce pathological products such as phlegm and blood stasis. The interaction of deficiency and excess factors results in the disease.

3. The Mechanism of Acupuncture Treatment for PSCI under the Guidance of Traditional Chinese Medicine Theory

Han Qichen [2] et al. believe that the occurrence of PSCI is closely related to the brain-gut axis, which can connect and communicate the cerebral cortex with the digestive system and serves as a bridge for communication and interaction between the cerebral cortex and the digestive system. The central nervous system, enteric nervous system, central immune system, hypothalamic-pituitary-adrenal (aixs, HPA),

and intestinal flora are all components of the brain-gut axis and the core of the neuroendocrine network [3]. The main function of the brain-gut axis is to regulate the levels of hormones such as ACTH and CORT and maintain the stability of the internal environment of the body. If the balance of the brain-gut axis is disrupted, the functions of the nervous, immune and endocrine systems will also be disordered, which plays a crucial role in the development of PSCI [4]. Studies have shown that acupuncture can treat PSCI by enhancing intestinal immunity, regulating intestinal flora and brain-gut peptides, and stabilizing the intestinal microecological environment. Acupuncture can regulate the diversity of intestinal flora and maintain the homeostasis of the intestinal environment to prevent and treat digestion System and nervous system diseases. Acupuncture can activate brain-gut peptides and regulate abnormal levels of brain-gut peptides through the brain-gut axis to achieve benigngut – brain interaction [5]. At the same time, it can adjust the disordered HPA axis to restore its normal function.

An Chengfei [6] et al. proposed that the occurrence of PSCI is closely related to the cardio brain-kidney axis. The heart-brain-kidneyaxisisformed based on the fact that the heart, brain and kidney jointly govern the spirit and have interconnected blood vessels. The location of PSCI is in the brain, but it is also closely related to the heart and kidneys. The fundamental pathogenesis of PSCI lies in the dysfunction of the heart spirit and deficiency of the kidney marrow. Therefore, for the acupuncture treatment of PSCI, the selection of acupoints should be combined with the heart, brain and kidney. Baihui, Sishencong, Shenting, Neiguan, Shenmen, Taixi and Sanyinjiao can be chosen to jointly achieve the effect of tonifying the heart and kidney, opening the orifices and awakening the spirit. For treating the brain, enhancing intelligence and calming the mind, acupuncture at the acupoint on the top of the peak can stimulate the frontal lobe of the brain and enhance the activity of neurons in the frontal and parietal lobes of the brain to improve the patient's memory [7], which is what is called "where the acupoint is located, the main treatment is within reach". Treating the heart, calming the mind and soothing the spirit, the function of the Heart meridian is closely related to the brain tissue. "Wherever the meridians pass, the main therapeutic effects reach." Kidney deficiency and reduced marrow are the fundamental causes of PSCI. Acupuncture at the kidney meridian points can nourish kidney essence and the divine mechanism can be reused. Furthermore, the Ling Shu: The Beginning and the End proposes: "For those with diseases above, choose those below..." For those with diseases on the head, the feet should be treated. Selecting kidney meridian acupoints such as Taixi and Sanyinjiao plays a significant role in imagining the obstacles of the disease. In conclusion, based on the theory of the heart-brain-kidney axis, needling the acupoints of the heart, brain and kidney meridians and regulating the three parts together can effectively treat PICI and greatly improve the memory and cognitive ability of patients with PSCI.

4. Simple Acupuncture Treatment for Cognitive Impairment after Stroke

Peng Tianzhong [8] et al. proposed that liver depression and blood deficiency, as well as deafness of the divine orifices, are the main pathogenesis of PSCI. The location of the disease is in the brain orifices and is related to the heart, liver, spleen, kidney and other internal organs, with "liver" and "deficiency" being the main focus. Therefore, the treatment should adopt the method of "soothing the liver and regulating the divine orifices". By applying the "Soothing the liver and regulating the Spirit" acupuncture method, select acupoints such as Fengchi, Baihui, Taiyang, Sishencong, Renzhong, Neiguan, Sanyinjiao, Xuehai, Touwei, and Taichong to jointly exert the effects of nourishing blood, soothing the liver, awakening the spirit, and opening the orifices. Studies have shown that the total effective rate of the MMSE score of the "Soothing the Liver and Regulating the Spirit" acupuncture method intreating cognitive impairment after stroke is 89.47%, and the total effective rate of the MOCA score is78.95%, suggesting that the treatment group is superior to the control group in all aspects of the cognitive domain. The "Soothing the Spirit and Regulating the Liver" acupuncture method for treating cognitive impairment after stroke affects the expression level of synaptic-related miRNAs in patients, down-regulates the expression of synaptic-related miRNAs, and repairs the damaged synapses, which can effectively improve the cognitive function of patients with cognitive impairment after stroke. Yang Jinhua [9] et al. proposed acupuncture based on the "Four Seas Theory", namely "Marrow Sea", "Qi Sea", "Blood Sea", and "Water and Grain Sea". The selected acupoints were Baihui, Fengchi, Dazhu, Shangjuxu, Xiajuxu, Dazhui, and Zusanli. The research showed that the MMES score, MOCA score, and SDSVD score of the treatment group were all higher than those of the control group. The latency ofP300in the brain topography of the treatment group was lower than that before treatment, the amplitude was higher than that of the control group, and the total effective rate of the treatment group was also higher than that of the control group. The acupoints formulated based on the Four Seas Theory have the functions of regulating the qi and blood throughout the body and nourishing the brain marrow. Needling this group of acupoints can effectively improve the learning and memory ability of patients with PSCI and significantly enhance their quality of life. WangFang [10] et al. utilized magnetic resonance waves Spectral (MRS) imaging technology was used to detect the changes in the contents of N-acetyl aspartic acid (NAA), choline (Cho), and creatine (Cr) in the brain tissue of the hippocampal region of the bilateral temporal lobes of patients with mild cognitive impairment after stroke before and after treatment. The imaging changes of patients with mild cognitive impairment after stroke were explored from the biochemical and metabolic levels. Acupuncture at Sishencong, Hegu, Taichong, Sanyinjiao, Fenglong, Zhongwan, Zusanli and other acupoints was combined with oral administration of nimodipine tablets. The research showed that the MoCA score of the treatment group was higher than that of the control group, the NAA/Cr was increased compared with that before treatment, and the Cho/Cr was decreased compared with that before treatment.

5. Acupuncture Combined with Other Methods for the Treatment of Cognitive Impairment after Stroke

Li L [11] et al. systematically evaluated the efficacy of acupuncture in the treatment of cognitive impairment after stroke. The results showed that combined acupuncture

treatment was superior to Western medicine or cognitive rehabilitation training in improving the cognitive function, overall remission rate and activities of daily living of patients with PSCI.

5.1 Combined Treatment of Acupuncture and Medication for Cognitive Impairment after Stroke

Zhang Jie [12] et al. proposed that the location of PSCI is in the brain and is closely related to the Governor vessel. Therefore, they put forward the "Tongdu Xingshen" acupuncture method, which stimulates peripheral and imagination receptors to transmit impulses to the higher central nervous system, thereby promoting the recovery of blood oxygen supply to the brain tissue, nourishing the brain tissue around the lesion to rebuild the neural network and repair the damaged tissue. Promote the recovery of brain tissue function and nerve repair in patients. Combined with the modified Xiaochaihu Decoction, it can regulate and disperse the qi movement, enhance the immune function, and regulate the central nervous system, among other effects. This method can effectively improve the cognitive function of patients. Cheng Shengqiang [13] treated the observation group with acupuncture (acupoints: Baihui, Sishencong, Zusanli, Xuehai, Geshu, etc.) combined with huayu Xingnao Decoction on the basis of Western medical treatment. The results showed that after treatment, the MoCAscore, MMSE score and ADL score of the observation group were all higher than those of the control group. The change range of neurotransmitter indicators and the improvement of nerve injury markers in the observation group were both higher than those in the control group. Hu Hao [14] et al. proposed that the control group was given oral Huanshaodan on the basis of conventional treatment, while the treatment group was given Xingnao Kaiqiao acupuncture on the basis of the control group. The research results show that the MMSE score, MoCA score and ADL score of the treatment group are all higher than those of the control group.

5.2 Acupuncture Combined with Rehabilitation Training is used to Treat Cognitive Impairment after Stroke

SongYang [15] et al. gave the control group conventional treatment, while the observation group, on the basis of conventional treatment, was treated with acupuncture under the guidance of the "brain-kidney correlation" theory: acupuncture was performed on acupoints such as Baihui, Sishencong, Fengchi, Shenshu, mingmen, yaoyangguan, and taixi to tonify the kidney and enrich essence. The results showed that the MoCA score, MBI score and FMAscore of thepatientsin the observation group were all higher than those in the control group. ChenLei [16] et al. adopted the therapy of acupuncture at Baihui and Shenting points combined with rehabilitation training. The results showed that after treatment, the MMSE scores of both groups of patients increased compared with those before treatment. After treatment, the scores of each item on the cognitive scale of both groups of patients increased significantly. The clinical effective rate of the treatment group was95.74%, significantly higher than that of the conventional group (72.34%). Tian Yanmin [17] et al. provided rehabilitation exercise therapy to the control group, while the treatment group was treated with acupuncture in combination on the basis of the control group. The selected acupoints were Baihui and Si Shencong, Dazhong, Xuanzhong, Yongquan. The research results show that after treatment, the NIHSS scores of both groups were significantly lower than those before treatment, with the treatment group being lower than the control group. After treatment, the MoCA scores and FMA scores of both groups were higher than those before treatment, with the treatment group being higher than the control group. After treatment, the levels of MDA and 8-OHdG in both groups were lower than those before treatment, with the treatment group being lower than the control group. The levels of GSH-Px in both groups increased compared with before, and those in the treatment group were higher than those in the control group. The total effective rate of the treatment group was 95.56%, which was higher than that of the control group at 73.33%. Studies by Liu Y [18, 19] et al. have shown that acupuncture treatment combined with rehabilitation training has a positive effect on improving the cognitive function and self-care ability of patients with PSCI. Su KQ [20] et al. 's research indicates that both holding the needle after electroacupuncture combined with cognitive training and electroacupuncture combined with cognitive training can effectively treat PSCI and improve the clinical symptoms, cognitive function and daily living ability of PSCI patients. The treatment effect of retention of needles after electroacupuncture combined with cognitive training is relatively good.

Acupuncture combined with rehabilitation exercise therapy can improve then daily living ability, cognitive function and motor function of patients with PSCI, and can greatly enhance the quality of life of patients.

5.3 Auricular Point Embedding Acupuncture Combined with Acupuncture for the Treatment of Cognitive Impairment after Stroke

Du Yijun [21] et al. proposed that on the basis of simple acupuncture in the control group, the observation group was also treated with auricular point embedding acupuncture. They compared the scores of each item and the total score of the Lovinston (LOTCA) cognitive test report before and after treatment between the two groups. The therapeutic effect of the observation group was better than that of the control group. Auricular acupuncture therapy is a traditional Chinese medical treatment method that is safe, convenient and more easily accepted by patients. The combination of auricular point embedding and acupuncture for treating cognitive impairment after stroke is superior to single acupuncture treatment.

5.4 Transcranial Direct Current Stimulation Combined with Acupuncture for the Treatment of Cognitive Impairment after Stroke

Transcranial direct current stimulation (tDCS) can stimulate the anode and cathode through weak polarized direct current (1-2mA), thereby achieving the purpose of regulating the excitability of nerve cells in the cerebral cortex. The combination of tDCS and acupuncture for the treatment of PSCI is an effective method. HuangYi [22] et al., on the basis of providing conventional treatment to patients, compared acupuncture treatment alone, tDCS treatment alone, and tDCS combined with acupunctureat the Shenting point and other

acupoint therapies. They found that aftertreatment, the MoCA score, NCSE score, and MBI score of the three groups of patients all improved compared with those before treatment. Among them, the effect of the acupuncture combined with tDCS group was more prominent. Acupuncture combined with tDCS can significantly improve the blood flow supply to the brain of patients, and at the same time, it can also promote the repair effect of neurotrophic factors on brain nerve injury. Liu Yinglong [23] et al. proposed that scalpacupuncture combined with tDCS stimulation of the Shenting and Benshen acupoints can effectively enhance Yang qi, control the activity of cholinesterase, reduce the damage to neurological function, increase the neuronal signals in the hippocampal region of patients, thereby improving their cognitive function and enhancing their quality of life.

6. Scalp Acupuncture is used to Treat Cognitive Impairment after Stroke

Deng Zhenxing [24] proposed the treatment of PSCI with scalp acupuncture combined with transcranialmagneticstimulation. The control group was given conventional treatment, while the observation group, in addition to conventional treatment, was also given scalp acupuncture combined with transcranial magnetic stimulation. By comparing the MMSE score, MoCA score and ADL score, it was found that after treatment, all the scores of the observation group were higher than those of the control group. Scalp acupuncture at areas rich in nerves and blood vessels on the head can effectively promote blood circulation and has a good effect on the recovery of limb function in patients with PSCI. Combined with transcranial magnetic stimulation therapy, it can stimulate the cerebral cortex and promote the recovery of brain function. Wang Molei [25] et al. treated PSCI with acupuncture at the head point combined with auricular point seed pressing. On the basis of conventional treatment, auricular point seed pressing was provided respectively (Select the heart, kidney, brain, subcortical, and Shen men points) and auricular point pressing combined with head point acupuncture treatment (selected points: Baihui, Sishencong, Shenting, and Shuangbenshen points). The study found that acupuncture at the head point combined with auricular point seed pressing could improve the vascular endothelial function of patients. After treatment, NO increased and ET-1 and NES decreased in both groups. Among them, the change range of index levels in the combined group was higher than that in the auricular point group. Acupuncture at the head point combined with auricular point seed pressing can also effectively improve the cognitive function of patients with PSCI. After treatment, the MESS score and Barthel score of both groups were higher than those before treatment, and the score of the combined group was even higher than that of the auricular point group. Wang Qinghua [26] et al. believe that scalp acupuncture treatmenthasanimpacton the MoCA score of patients with PSCI. The control group was given cognitive training.

On the basis of the control group, self-massage of the head and scalp acupuncture treatment were respectively given. The acupoints and lines for massage were the same as those for scalp acupuncture. In addition, three groups of patients were given symptomatic treatment with drugs to improve cognitive dysfunction. The results showed that the MoCA scores of all three groups were higher than those before treatment after the treatment, among which the scores of the scalp acupuncture group were higher than those of the massage group and the control group. Ban Weigu [27] et al. proposed the use of head acupuncture combined with acupuncture at the Thirteen Ghosts point to treat PSCI. The results showed that head acupuncture combined with acupuncture at the Thirteen Ghosts point could effectively improve the cognitive ability and daily living ability of PSCI patients, and also upregulate the level ofmiRNA-335in peripheral blood.

7. Summary

Post-stroke cognitive impairment has a significant impact on the quality of life of patients. Acupuncture, as a safe, convenient, easy-to-operate and cost-effective traditional Chinese medical therapy, can not only greatly leverage the advantages of traditional Chinese medicine, but also improve the living standards of patients and enhance their ability to live independently by combining with other therapies. More and more studies have also shown that acupuncture treatment for cognitive impairment after stroke is indeed feasible and has great advantages. At present, in clinical practice, due to inconsistent acupoint selection and evaluation criteria, there are still differences in research results, and higher-quality research is still needed.

References

[1] Aini He; Zu Wang; Xiao Wu; Wei Sun; Kun Yang; Wuwei Feng; Yuan Wang; Haiqing Song. Incidence of post-stroke cognitive impairment in patients with first-ever ischemic stroke: a mu lticenter cross-sectional study in China. The Lancet Regional Health-Western Pacific. 2023, 1, 00687.

[2] HAN Q C, SUN Z R, YIN H N, et al. Action mechanism of acupuncture in treatment of post-stroke cognitive impairment based on theory of brain-gut axis[J]. Information on TCM, 2022, 399(4): 10-15, 46.

[3] NIEMARKT H J, DEMEIJT G, GANZEWINKEL C J, etal. Necrotizing enterocolitis, gut microbiota, and brain development: role of the Brain-GutAxis[J]. Neonatology, 2019, 115 (4): 423-431.

[4] KIM B, KANAIMI, OH Yetal. Response of the microbiome-gut-brain axis in Droso phila toaminoaciddeficit[J]. Nature, 2021, 593 (7860): 570-574.

[5] Bu Liying, Lu Dongmei. Theinfluenceof Spleen-strengthening and liver-soothing Acupuncture on brain-intestinal peptides and anxiety and Depression in Patients with diarrhea-predominant irritable bowel Syndrome [J] Journal of Modern Integrated Traditional Chinese and Western Medicine, 2020, 29 (10): 1074-1077

[6] An Chengfei, ZhaoQi, DuYuzheng. Exploringthepathogenesis and acupuncturepointselectionideas of cognitive impairment after Stroke based on the “heart-brain-Kidney Axis” [J]. Journal of Traditional Chinese Medicine, 0221, 62(24):2135-2139.

[7] ZhongHui. fThe Effects of Acupuncture at the Shenting and Baihui Acupoints on Memory Function in Post-

stroke Patients: A fMRI Study Based Amplitude of Low Frequency Fluctuation [D]. Chinese Master's Theses Full-text Database, 2018.

[8] Peng Tianzhong, HuangXuedi, LinXingzhen, et al. The effect of the acupuncture method for soothing the liver and regulating the spirit on the treatment of cognitive impairment after stroke and itsinfluenceon the expression of synaptic associated miRNAs [J] Journal of Integrated Traditional Chinese and Western Medicine in Cardiovascular and Cerebrovascular Diseases, 2023, 21(17):3247-3251.

[9] YangJinhua, ZhuYonglei, HanBing, et. World Journal of Acupuncture-moxibustion, 2022, 32(04):324-328.

[10] WangFang, LiangHui, Chen Su, et al. Magnetic Resonance Spectroscopy Study on Acupuncture Regulation of Brain Tissue Metabolism in the Treatment of Mild Cognitive Impairment after Stroke [J] Chinese Journal of Emergency Medicine, 2014, 23(10):1928-1930.

[11] Li L, Yang L, Luo B, Deng L, Zhong Y, Gan D, Wu X, Feng P,, Zhu F. Acupuncture for P ost-Stroke Cognitive Impairment: An Overview of Systematic Reviews. Int J Gen Med. 2022 Sep 13; "249-7264.

[12] Gong Zhibin, LiangXiaojun, ZhangJie. Professor ZHANG Jie's experience in treating post-stroke cognitive impairment by acupuncture plus medicine[J]. Clinical Research of Traditional Chinese Medicine, 2023, 15(13):108-111.

[13] Cheng Shengqiang. Therapeutic Effect of Acupuncture Combined with Huayu Xingnao Decoction in the Treatment of Cognitive Dysfunction After Stroke. Proceedings of the Second National Academic Exchange Conference on Rehabilitation and Clinical Pharmacy (PartThree). ed. Zunyi First People's Hospital 2022, 297-303.

[14] HU Hao, SUN Shan-bin, Anhui University of Traditional Chinese Medicine, et al. Clinical Study of Xingnaokaiqiao Acupuncture Combined with Huanshao Pill in the Treatment of Cognitive Impairment after Stroke[J]. Chinese Manipulation and Rehabilitation Medicine, 2023, 14(03): 13-15, 19.

[15] SongYang, ZhaoFeng, Huang Wenhao, etal. Therapeutic Observation of Acupuncture Based on Brain-kidney Correlated Theory Combined with Rehabilitation Training for Post-stroke Cognitive Impairment[J] Shanghai acupuncture magazine, 2020, 33(6) 6:657-660.

[16] CHEN Lei, JIAO Peng, LI Fanghui, et al. Acupuncture at Baihui, Shenting Point and Rehabilitation Training for Post-stroke Cognitive Dysfunction[J]. Chinese Journal of Geriatric Care, 2020, 18(02): 11-13.

[17] TTIAN Yan-min, MAO Ling-di, YANG Ai-chun, et al. Effects of acupuncture combined with rehabilitation exercise on cognitive impairment, motor function and stress response after stroke[J]. Guangdong Medical Journal, 2023, 44(09): 1110-1113.

[18] Liu Yang, Chen Fuyan, Qin Peng, et al. Acupuncture treatment vs. cognitive rehabilitation for post-stroke cognitive impairment: A systematic review and meta-analysis of randomized controlled trials [J]. Frontiers in Neurology, 2023, 14:1035125.

[19] Yuan HW, Liu YX, Zhang H, Liu Y, Li XL,, Ni JX.[Tongdu Xingshen acupuncture and moxi bustion combined with cognitive training in treatment of, post-stroke mild cognitive impairmen t: a randomized controlled trial]. Zhongguo Zhen Jiu. 2022 Aug 12; 42 (8): 839-843.

[20] Su KQ,, Lv Z,, Wu ML,, Luo M,, Gao J,, Li RQ,, Zhang ZX,, Hu B,, Feng XD. Needle retainin g after electroacupuncture combined with cognitive training for post-stroke cognitive, impairment: a multi-center randomized controlled trial. Zhongguo Zhen Jiu. 2023 Oct 11; 43 (11): 1221-1225.

[21] DU Yi-jun, WANG Yong-hui, MA Yan-ping. 30 Cases of Cognitive Dysfunction after Stroke Treated by Ear Point Embedding Acupuncture Combined with Acupuncture[J]. Jiangxi Journal of Traditional Chinese Medicine, 2020, 51(05): 57-60.

[22] HuangYi, Zhou Wenqiang. Analysis of the Effect of Transcranial Direct Current Stimulation Combined with Acupuncture in the Treatment of Cognitive Impairment Patients after Stroke [J]. Fujian Medical Journal, 2023, 45(05):75-78.

[23] Liu Yinglong, Liu Junhong, Li Fangfang, et al. The Effects of Electroacupuncture at Baihui and Shenting points on Cognitive Function and Neurotransmitters in Patients with Alzheimer's Disease [J]. Modern Chinese Medicine, 2022, 42 (1): 104-107.

[24] Deng Zhenxing. Observation on the Clinical Effect of Scalp Acupuncture Combined with Transcranial Magnetic Stimulation in the Treatment of Cognitive Impairment After Stroke [J]. Bethune medical journal, 2015, 13(01): 105-106.

[25] WANG Molei, MA Liqun, LI Hua, et al. Effect of Scalp Acupuncture Combined with Auricular Point Sticking on Vascular Endothelial Function and Cognitive Level for Patients with Post-stroke Cognitive Impairment[J]. Journal of Sichuan of Traditional Chinese Medicine, 2022, 40(10): 197-200.

[26] WANG Qinghua, CHU Zhaohu, XU Yesong, et al. Treatment efficacy of scalp acupuncture on the score of MoCA and serum of Hcy in stroke patients with obstacles cognitive[J]. Chinese Journal of Clinical Pharmacology and Therapeutics, 2017, 22(02): 165-169.

[27] BAN Wei-gu, TENG Xiu-ying, GONG Fei-fei, et al. Effect of Puncturing the Thirteen Ghost Points Combined with Cluster Needling at the Scalp Acupoints on the Expression of miRNA-335 in Patients with Post-stroke Cognitive Impairment[J]. Shanghai Journal of Acupuncture and Moxibustion, 2021, 40(12): 1395-1400.