

Current Status of Research on the Treatment of Stroke with Wrist Ankle Acupuncture

Haofeng Wang^{1, a*} and Hujie Song^{2, b}

¹*Shaanxi University of Chinese Medicine, Xianyang, Shaanxi 712046, China*

²*Xi'an Chinese Medicine Encephalopathy Hospital Affiliated to Shaanxi University of Traditional Chinese Medicine, Xi'an, Shaanxi 710032, China*

^a*2606209544@qq.com*, ^b*13909231298@163.com*

**corresponding author*

Keywords: Wrist Ankle Needle, Stroke; Sports, Pain, Feeling, Shoulder Hand Syndrome

Abstract: "Stroke" is a major disease with high incidence rate, disability and mortality. Wrist ankle acupuncture is gradually used to treat stroke and stroke sequelae due to its small pain, obvious curative effect, and convenient operation. This article summarizes, sorts out, and analyzes the literature of the past five years, focusing on the characteristics of the efficacy of wrist ankle acupuncture in the treatment of stroke, and explores the feasibility of wrist ankle acupuncture in the treatment of stroke from the perspective of improving movement, pain, sensory impairment, shoulder hand syndrome, and other important aspects after stroke, in order to provide more research ideas and treatment strategies for the further application of wrist ankle acupuncture in the treatment of acute stroke.

"Stroke" (hereinafter referred to as "stroke"), referred to as "stroke" in traditional Chinese medicine, is an acute cerebrovascular disease that causes brain tissue damage due to sudden rupture of brain blood vessels or blockage of blood vessels that prevents blood from flowing into the brain. It includes ischemic stroke and hemorrhagic stroke, with the incidence of ischemic stroke accounting for 69.6% to 70.8% of all strokes. [1,2]. Surviving patients after stroke often show limb spasticity and sensory disorders, most of which are accompanied by cognitive, speech, swallowing, defecation and other disorders. Stroke, with its high incidence rate, high disability rate, and younger incidence trend, seriously threatens people's healthy life. Western medicine currently focuses on thrombolysis, intracranial pressure reduction, and early symptomatic support treatment. Early intervention with acupuncture in traditional Chinese medicine is beneficial to the patient's further recovery [3]. In clinical practice, wrist-ankle acupuncture has been gradually applied to the rehabilitation treatment of stroke due to its unique advantages of easy manipulation, light pain, fast

efficacy, and easy acceptance by patients. This article summarizes the clinical research on wrist ankle acupuncture as the main treatment for stroke as follows.

1. Wrist Ankle Needle Theory

Wrist ankle acupuncture is a acupuncture method proposed by Professor Zhang Xinshu in 1975. It is a special acupuncture treatment that uses filiform needles to perform subcutaneous shallow needling only on the wrist and ankle to achieve therapeutic purposes. The treatment basis originates from the theory of the six meridians, the theory of the camp health association, the theory of specimens, and modern neurological theory. "Su Wen": "Where there are twelve meridians and collaterals, the part of the skin is also the same." "Wei Qi precedes the skin, and first fills the collaterals." "Biao You Fu": "Needling according to the specimen will always heal." The wrist and ankle needles are used to gently prick the skin of the six longitudinal areas of the wrist and ankle of the limbs, and require that no lifting, inserting, twisting, and turning be performed after the needle is inserted to avoid feelings such as soreness, numbness, swelling, and pain. Although different from traditional acupuncture, it is required to "obtain Qi" after the needle is inserted, there are ways to regulate the Wei Qi Communicating the twelve meridians and qi mechanisms to treat diseases in the interior and distal limb diseases. Generally, needle retention lasts for half an hour, and the time of needle retention can be appropriately adjusted according to different diseases. When clinically applied, patients have good compliance [4].

2. Modern Action Mechanism of Wrist Ankle Acupuncture

After stroke α and γ The excitatory inhibition balance of motor neurons is broken, leading to γ Motor neurons dominate, reducing central inhibitory effects, and patients have abnormally high muscle tone, or limb spasms cause pain [5]. Wrist ankle acupuncture can stimulate subcutaneous loose connective tissue, release local fascia, stimulate subcutaneous nerve receptors, improve local circulation and cerebral microvascular perfusion, and stimulate the corresponding nerve segments in the six longitudinal regions to regulate the neurohumoral regulatory system, promoting the reconstruction of neural function [6-8]. Subcutaneous shallow needling can also promote the release of opioids to inhibit pain signal transmission, and the synthesis of monoamines can improve the body's pain threshold, achieving analgesic effects [9].

3. Progress in Clinical Treatment

3.1. Improving Poststroke Movement Disorders

Currently, wrist and ankle acupuncture combined with traditional acupuncture, rehabilitation training, oral muscle relaxants, and meridian ebb injection acupuncture are mainly used to improve motor function after stroke, resulting in a "1+1>2" effect, enhancing the efficacy of the original treatment, reducing patient muscle tension, improving motor function scores, improving the degree of nerve defect, and reducing the level of Hcy in elbow extension resistance. Chen Jinyu [10], on the basis of oral Baclofen, used wrist ankle acupuncture in the upper 5 and lower 4 regions and traditional acupuncture to treat patients with spastic hemiplegia after stroke. He found that it can effectively improve nerve defects, reduce muscle spasms, and reduce the degree of disability of the affected limb. He pointed out that wrist ankle acupuncture combined with yang meridian acupuncture can communicate yin and yang, replenish deficiency and reduce excess, and promote the recovery of motor function of the affected limb by promoting the upper conduction of nerve fibers. Jing Fuquan et al. [11], based on comprehensive rehabilitation therapy, used wrist and ankle

acupuncture in the upper and lower regions and abdominal acupuncture to treat hemiplegia due to ischemic stroke. They found that long-term intervention can stimulate the skin meridian qi, improve the tension of core muscle groups, improve balance function, and reduce the serum Hcy level. Zhang Meng and Liu Yuanyuan [12] found that the improvement of muscle spasticity in the treatment of hemiplegia after stroke by using wrist ankle needles in the upper 5 and lower 4 areas and traditional acupuncture on the basis of oral etoperidone tablets may be affected by factors such as intervention time and course of treatment. Liu Junhong et al. [13], on the basis of conventional medical treatment, used wrist and ankle acupuncture to remove the upper 4, 5, lower 2, 4, and 5 areas and traditional acupuncture point electroacupuncture to treat hemiplegia after stroke. According to the situation of the head, face, and two stools, adding bilateral upper 1, and lower 1 areas can significantly improve muscle strength to levels IV to V. Long term intervention and flexible acupoint selection may affect the therapeutic effect. The sample size of this study is large enough to ensure that there are no adverse reactions throughout the treatment. You Mengqi et al. [14] used wrist ankle needles in the upper 5 and lower 4 zones to treat stroke hemiplegia on the basis of routine medical treatment and rehabilitation training, and found that their therapeutic efficacy in reducing muscle tension in spastic muscles of the elbow and knee joints was particularly significant, which could be significantly reduced to Level I. There is a retrospective study [15] that found that the upper 5 and lower 4 areas of the wrist and ankle acupuncture can improve the motor and language abilities of patients after stroke, significantly promote the absorption of intracranial non coagulation, and improve the daily living ability of patients. It is clear that the wrist and ankle acupuncture has significant therapeutic effects from factors such as the location and size of the lesion. Wu Qi [16] applied isokinetic muscle strength training to patients with elbow joint flexor spasms in the recovery period after stroke, and found that it can reduce muscle tension and improve passive elbow extension resistance of the upper limb. Zhao Chaoling [17] applied wrist and ankle acupuncture in areas 2, 4, 5, and 6 on the basis of routine medical treatment and rehabilitation training to treat hemiplegia patients with wind phlegm stasis type after stroke. He found that the upper limb motor function had the most significant effect after 2 weeks of treatment, and also found that the patient's fine hand movements such as grasping and pinching on the affected side had significantly improved, which better reflected the early effect and fast time effect of wrist and ankle acupuncture during the treatment process. Xu Sihuan [18] treated hemiplegia after stroke by using wrist and ankle needles to remove the upper, lower, 5th, and 6th zones on the basis of traditional acupuncture, and found that the recovery of muscle tension in the upper and lower extremities of the affected side can be mainly reduced to Level I+, while the muscle tension in the lower extremities can be significantly reduced to Level I. He pointed out that wrist and ankle needles can stimulate the human body's yang qi to support yang and smooth the meridians, soften the tendons, and alleviate muscle spasms by relieving pain, stimulating corresponding nerve segments, and releasing local muscle fasciae, the purpose of reducing abnormal posture. To sum up, treatment with wrist ankle acupuncture in the upper, lower 4, and 5 regions can significantly improve motor function and reduce muscle tension in patients after stroke. The curative effect of the upper limb is superior to that of the lower limb, and there is a certain correlation between the intervention time and course of treatment. The early effect of intervention is significant(Figure 1).

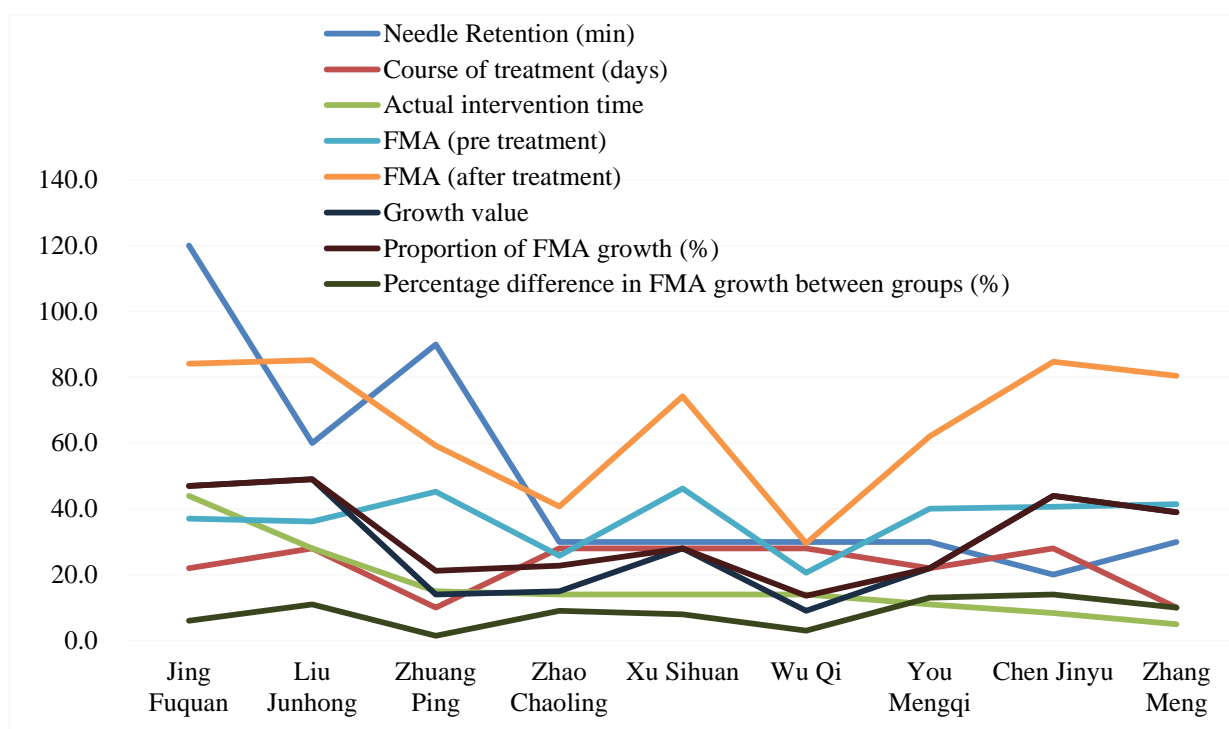


Figure 1. The effect of wrist ankle acupuncture as the main therapy on post stroke FMA

3.2 Improve Pain

Wrist ankle acupuncture is often used to treat pain related diseases in clinical practice, so it is gradually used to improve limb pain, headache, and shoulder pain after stroke. Jin Yu and Wang Fei [19] used wrist and ankle acupuncture to remove areas 3, 4, and 5 on the basis of traditional acupuncture to treat patients with shoulder pain after stroke (including cerebral hemorrhage), and found that it can significantly eliminate the symptoms of shoulder pain. Zhu Jie and Luo Yueqin [20] found that the number of patients with NRS score of 0 in the treatment group was significantly greater than that in the control group, and the number of patients with NRS scores of I and II was the largest, indicating that wrist and ankle acupuncture has advantages over conventional Western medicine in eliminating limb pain after stroke, and the NRS score is based on the direct subjective feelings of patients, making the evaluation results more scientific. Chao Yu and Wang Min [21], on the basis of routine medical symptomatic treatment and oral administration of carbamazepine, used wrist and ankle acupuncture to take the upper 5 and lower 4 areas of both sides, combined with Huoxue Tongluo Lotion and Jiaji Acupuncture to treat post stroke thalamic pain in the recovery period. They found that traditional Chinese medicine treatment based on wrist and ankle acupuncture has significant early efficacy in relieving post stroke pain, which has irreplaceable clinical advantages over Western medicine treatment. Han Wencong et al. [22] treated patients with post stroke headache with wrist ankle acupuncture combined with Tianmen manipulation on the basis of conventional medical symptomatic treatment, and found that the degree of headache decreased quickly in a short period of time. The latest analysis points out that [23], wrist ankle acupuncture has a definite effect on relieving shoulder pain after stroke, and can improve the patient's motor function and daily living ability to a certain extent. However, further research is needed in terms of the analgesic mechanism, the relationship between analgesia and motor function (Figure 2).

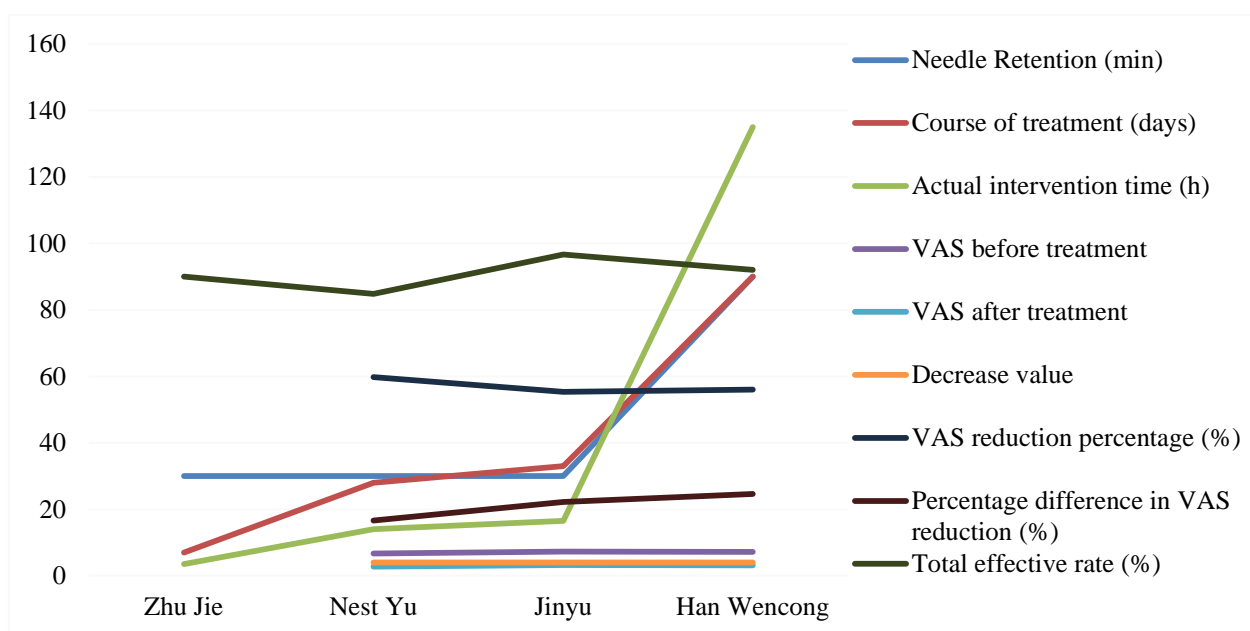


Figure 2. The effect of wrist ankle acupuncture as the main therapy on post stroke VAS

3.3 Improving Poststroke Sensory Disorders

Zhuang Jingxiang [24], on the basis of traditional acupuncture, treated patients with hemiplegia (including cerebral hemorrhage) after stroke of qi deficiency and blood stasis type with wrist ankle acupuncture in the upper, lower 4, and 5 regions, and found that it can significantly reduce the degree of superficial sensory, proprioceptive, and composite sensory impairment, shorten the latency of somatosensory evoked potentials on the affected side, and improve the performance of the upper limb better than the lower limb. He pointed out that wrist ankle acupuncture can promote the reconstruction of damaged sensory conduction pathways. However, peripheral nerve function was not evaluated and analyzed based on the amplitude of somatosensory evoked potentials. Fang Meifeng et al. [25] used wrist ankle acupuncture combined with rehabilitation training to significantly improve the conduction velocity of peripheral nerves on the affected side, improve the motor ability and autonomous living ability of the affected limb, indicating that there may be a connection between sensory function and motor accuracy, which requires further research. According to research by Fu Biao et al. [26], from the perspective of hemodynamics and somatosensory evoked potential amplitude, it has been found that taking the upper and lower regions of the wrist and ankle acupuncture combined with mecobalamin tablets can significantly improve the peripheral nerve function of patients after stroke, increase brain blood flow rate and flow, improve clinical symptoms by increasing the blood supply of ischemic brain tissue, and significantly improve the quality of life of patients. Zou Yulong et al. [27] treated patients with hemisensory abnormalities after stroke (including patients with cerebral hemorrhage) with traditional acupuncture based on Bapentine and wrist ankle acupuncture in areas 5, 6, 4, and 5, and combined with scalp acupuncture. They found that the efficacy of traditional acupuncture alone was not significant, and the combined effect of wrist ankle acupuncture, scalp acupuncture, and Bapentine was the best. Yan Kai et al. [28] found that taking the upper, lower, and fourth and fifth regions of the wrist and ankle acupuncture combined with mecobalamin tablets can significantly improve the peripheral nerve function of patients after stroke, increase brain blood flow rate and flow, and improve clinical symptoms. Currently, there is no significant positive correlation between the clinical effect of wrist ankle acupuncture as the main treatment for post stroke sensory disorders

and the selection of different regions of the wrist and ankle, as well as the length of intervention. However, it can indeed promote the reestablishment of superficial and complex sensory functions on the affected side after stroke. Further research is needed on its efficacy and mechanism of improving deep sensation after stroke (Figure 3).

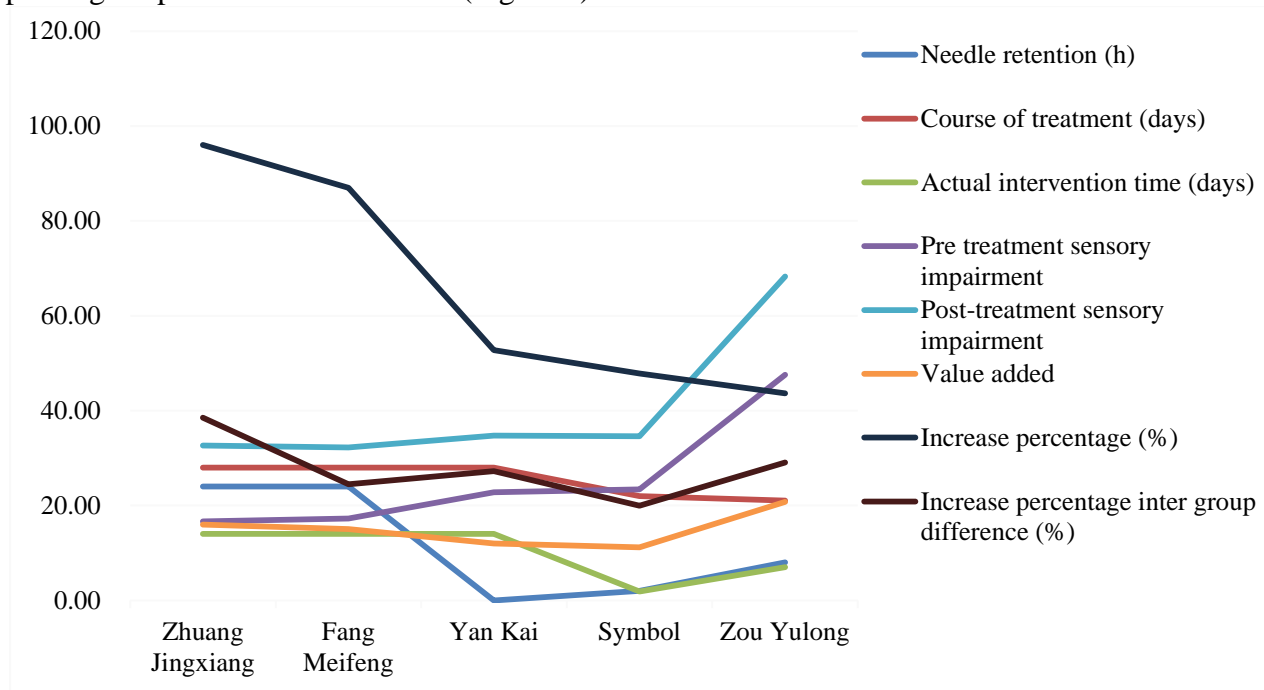


Figure 3. The effect of wrist ankle acupuncture as the main therapy on sensory function after stroke

3.4 Improving Shoulder Hand Syndrome after Stroke

Shen Yinli and Wang Jieying [29] used wrist and ankle acupuncture to treat stage I patients with post stroke shoulder hand syndrome on the basis of routine rehabilitation training, and found that wrist and ankle acupuncture has more clinical value in improving limb pain in shoulder hand syndrome than simple rehabilitation treatment. Jiao Lina et al. [30] found that the treatment of shoulder and hand syndrome with Buyang Huanwu Decoction plus the use of wrist and ankle acupuncture in areas 4, 5, and 6 can enhance the analgesic effect. In the wrist and ankle acupuncture group, more than 1/2 of the patients' pain disappeared, with a total effective rate of 90% (70% in the control group), making up for the shortcomings of simple traditional Chinese medicine decoction that has a slow onset of effect and a long duration of effect, and promoting the recovery of upper limb function on the affected side to a certain extent. Jiang Wanming et al. [31] used Wuzi heat dissipation ironing on the basis of wrist and ankle acupuncture and conventional pain care treatment, and found that the combination of acupuncture and medicine can significantly reduce the swelling of the affected limb, eliminate pain, and improve the motor function of the affected limb. However, more than 1/3 of patients in the wrist and ankle acupuncture and conventional nursing group still have no pain relief effect, indicating that the combination of acupuncture and medicine can maximize its pain relief and swelling reduction effect. Li Ruiqing et al. [32], on the basis of conventional medical treatment, respectively, used wrist and ankle acupuncture in areas 4, 5, and 6, as well as traditional acupuncture to treat patients with shoulder hand syndrome after stroke (including those caused by cerebral hemorrhage), and found that it can significantly alleviate joint pain, reduce swelling, prevent the development of muscle atrophy, and improve activity. The treatment results mainly focused on the significant and effective range. However, this study

evaluated limb swelling through SHSS evaluation combined with drainage method, and the results were more reliable. Zhang Nan [33] treated stage I patients with shoulder hand syndrome after stroke with wrist and ankle acupuncture, and found that the pain was most significantly reduced after 4 weeks of treatment (VAS score of 1.0 in the wrist and ankle acupuncture group, VAS score of 3.4 in the traditional acupuncture group). However, there was no significant difference in improving the motor function of the affected limb between the two groups, and the treatment of swelling of the affected limb took effect quickly while the cure was slow. Xu Jun et al. [34] added Buyang Huanwu Decoction and wrist ankle acupuncture to areas 4, 5, and 6 on the basis of conventional internal medicine and rehabilitation treatment, and found that it can significantly reduce pain and relieve muscle spasm in patients, indicating that acupuncture combined with medicine has clinical advantages over conventional Western medicine in relieving symptoms, but there is no significant difference in curing shoulder hand syndrome compared to Western medicine treatment. Currently, wrist ankle acupuncture combined with traditional Chinese medicine is a major clinical advantage in the treatment of shoulder hand syndrome after stroke, with a particularly significant effect on pain relief. Further clinical research and mechanism exploration should be actively carried out(Figure 4).

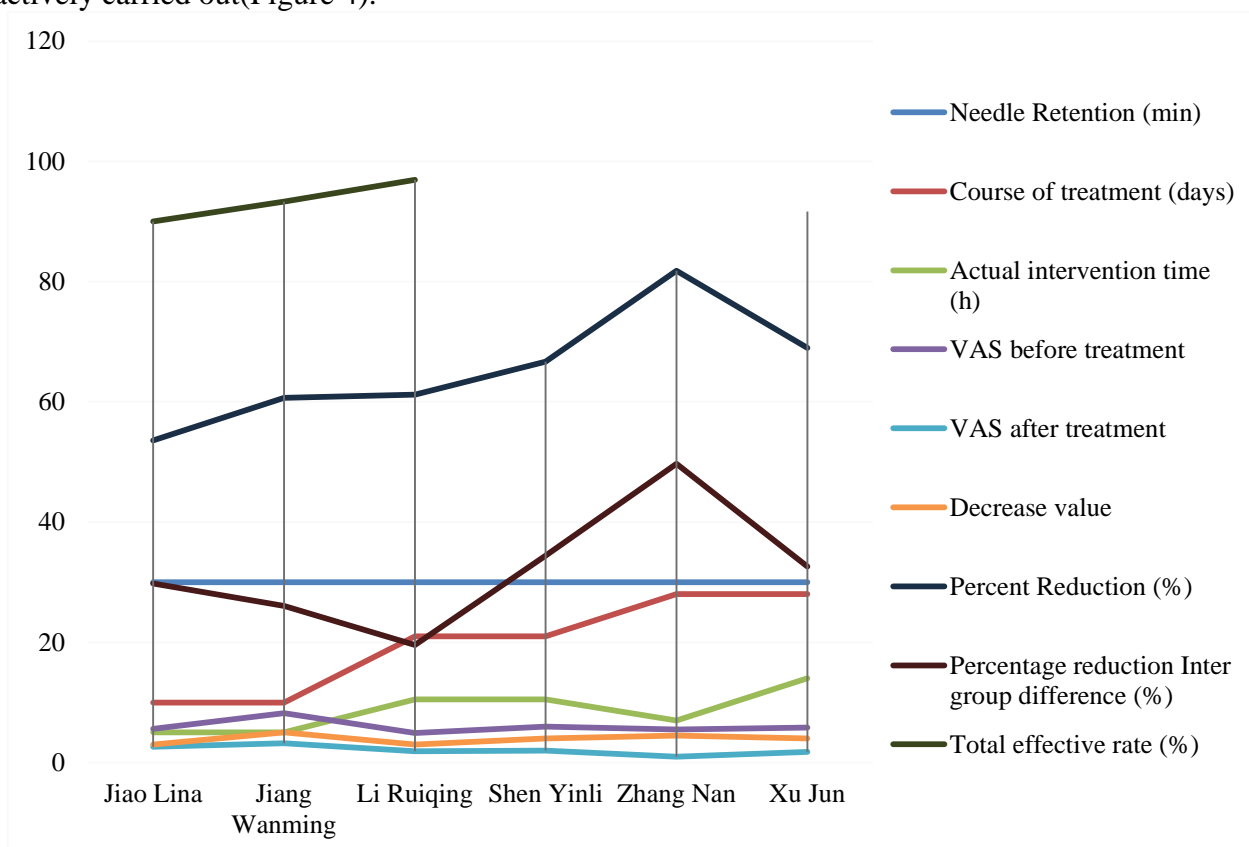


Figure 4. The effect of wrist ankle acupuncture as the main therapy on shoulder hand syndrome after stroke

3.5. Other Aspects

Tang Qiaolu et al. [35] used wrist and ankle acupuncture to take bilateral upper and lower regions 1 and 2 for treatment of post stroke swallowing disorders (including those caused by cerebral hemorrhage), and found that it can improve the quality of life of patients with swallowing disorders, and evaluated the improvement of swallowing from imaging, which is better than the

traditional acupuncture group. Gui Meilin et al. [36] found that the application of wrist ankle acupuncture combined with swallowing therapy instrument can significantly improve the Wada drinking water test level of patients with post stroke swallowing disorders by more than 2, with a total effective rate of 86.67% (control group 75.86%), which can improve the quality of life of patients with swallowing disorders. The evaluation methods and mechanisms of wrist ankle acupuncture for treating post stroke swallowing disorders still need to be further explored. Wu Mengting and Chen Miao [37] found that wrist and ankle acupuncture combined with rehabilitation training can significantly improve the swallowing dysfunction caused by cyclopharyngeal muscle atony after stroke based on imaging and SSA evaluation tables, and this research evaluation is more comprehensive and safe. Teng Haiyan and Yang Zhong [38] found that using wrist ankle acupuncture to treat patients with constipation after stroke (including those caused by cerebral hemorrhage) can significantly improve the defecation speed, shorten the defecation interval to within 3 days, and improve the defecation speed to 15-20 minutes or less, with a total effective rate of 95.56 (73.33% in the control group). Jiao Lina et al. [39] used wrist and ankle acupuncture to take bilateral upper zone 1 needles on the basis of estazolam tablets to treat patients with insomnia after stroke, and found that the time for patients to fall asleep was significantly shortened, the sleep time was significantly prolonged, and the sleep efficiency was significantly improved. More than 1/3 of the treatment group patients had longer sleep time to more than 6 hours, and the next day was full of energy. They pointed out that acupuncture of upper zone 1 could regulate the heart meridian of hand Shaoyin to play a role of tonifying qi, nourishing blood, and calming nerves, and had no adverse reactions compared to oral administration of western drugs, Improving insomnia after stroke has clinical advantages. Chao Yu and Wang Min found that wrist ankle acupuncture has clinical advantages in improving anxiety and sleep quality after stroke, which may be related to pain relief, and further clinical research is needed. In addition, [40] scholars have found that wrist ankle acupuncture combined with fluoxetine can significantly improve post stroke depression, and the efficacy is positively correlated with the thickness of wrist ankle acupuncture. Strong wrist ankle acupuncture stimulation combined with fluoxetine can enhance the antidepressant effect.

4. Problems and Prospects

Wrist and ankle acupuncture as the main therapy has significant early effects in the treatment of ischemic stroke or hemorrhagic stroke. It requires long-term treatment in improving movement disorders, and in eliminating post stroke pain, it is currently a major feature to cooperate with western medicine oral administration and traditional Chinese medicine lotions. In the treatment of post stroke sensory disorders, clinical research is needed to improve deep sensation. Wrist and ankle acupuncture can significantly enhance the efficacy of the original treatment in the treatment of shoulder hand syndrome, In order to improve the cure rate, it is necessary to extend the intervention time and course of treatment, and to support multicenter and large sample clinical data. The commonly used insertion positions for wrist ankle acupuncture in the treatment of stroke are the upper, lower 1, 4, 5, and 6 regions, which can be adjusted according to different symptoms. To sum up, currently using wrist ankle acupuncture to treat multiple sequelae after stroke is a positive choice.

Funding

National Administration of Traditional Chinese Medicine 2021 Academic Research Project of Traditional Chinese Medicine: Real World Clinical Research on Combination of Traditional Chinese and Western Medicine for Spastic Cerebral Palsy (GZY-KJS-2021-003).

Data Availability

The datasets used during the current study are available from the corresponding author on reasonable request.

Conflict of Interest

The author states that this article has no conflict of interest.

References

- [1] Peng Bin, Wu Bo. *Chinese Guidelines for the Diagnosis and Treatment of Acute Ischemic Stroke 2018*. *Chinese Journal of Neurology*, 2018, 51 (09): 666-682
- [2] Jia Qianfang. *Evaluation of the efficacy of wrist ankle acupuncture in the treatment of upper limb dysfunction in children with spastic cerebral palsy*. *Xinxiang Medical College*, 2019: 30.18. *Chinese Journal of Neurology*, 2018, 51 (09): 666-682
- [3] Lin Zhicheng, Xue Xiehua, Jiang Yijing, et al. *Clinical Practice Guide for Traditional Chinese Medicine Rehabilitation: Stroke*. *Rehabilitation Journal*, 2019,29 (06): 6-9+15
- [4] Zhang Xinshu. *Wrist Ankle Needle [M]*. Third Edition. Beijing: People's Military Medical Press, 1997
- [5] Baude M, Nielsen JB, Gracies JM. *The neurophysiology of deforming spastic paresis: A revised taxonomy[J]*. *Annals of Physical and Rehabilitation Medicine*,2019,62(06):426-430.
- [6] Yuan Lin, Jiao Peifeng, Tang Lei, Huang Wenhua. *The material basis of the meridian theory of traditional Chinese medicine: connective tissue, fascia, and automonitoring system*. *China Basic Science*, 2005 (03): 44-47
- [7] Fan Yushan, Luo Yan. *Effect of shallow needling at Shuigou and Neiguan on CasPase-3 protein expression in ischemic penumbra of cerebral infarction rats*. *Clinical Journal of acupuncture and moxibustion and Moxibustion*, 2007,23 (2): 45-48
- [8] Guo Shanshan, Fu Xinhao, Qin Zhaomei, et al. *The influence of neural segment effects on acupoint selection based on data mining*. *Journal of Chengdu University of Traditional Chinese Medicine*, 2019, 42 (4): 65-69
- [9] Han Yingying, Lin Wenxin, Wang Yang, etc *Analysis of wrist ankle acupuncture [C]*//*Chinese acupuncture and moxibustion Society. Proceedings of the annual meeting of the Chinese acupuncture and moxibustion Society in 2002 [Publisher unknown]*, 2022:4. DOI: 10.26914/c.cnkihy.2022.018308
- [10] Chen Jinyu. *Observation on the therapeutic effect of acupuncture combined with wrist ankle acupuncture on spastic hemiplegia after stroke*. *Inner Mongolia Journal of Traditional Chinese Medicine*, 2017,36 (04): 121. DOI: 10.16040/j.cnki.cn15-1101.2017.04.117
- [11] Jing Fuquan, Zhou Yu, Niu Xianglai, et al. *Clinical observation on abdominal acupuncture, wrist ankle acupuncture combined with rehabilitation therapy for ischemic stroke hemiplegia*. *Shanghai acupuncture and moxibustion Journal*, 2018,37 (02): 154-158. DOI: 10.13460/j.issn.1005-0957.2018.02.0154
- [12] Zhang Meng, Liu Yuanyuan. *Analysis of the therapeutic effect of acupuncture combined with wrist ankle acupuncture on spastic hemiplegia after stroke*. *Intelligent Health*, 2018,4 (06): 77-78. DOI: 10.19335/j.cnki.2096-1219.2018.06.035
- [13] Liu Junhong, Wu Zhimin, Zhang Kechang, et al. *The effect of wrist ankle acupuncture combined with electroacupuncture in the treatment of ischemic stroke and hemiplegia*. *World Journal of Integrated Chinese and Western Medicine*, 2019, 14 (11): 1596-1599+1604. DOI: 10.13935/j.cnki.sjzx.191128

- [14] "You Mengqi, Luo Zirui, Liu Tao, et al. Observation on the efficacy of scalp acupuncture combined with wrist ankle acupuncture in the treatment of muscle spasm after stroke. *Journal of External Treatment of Traditional Chinese Medicine*, 2021,30 (05): 43-45."
- [15] Zhuang Ping, Chen Fengmei, Yi Ling, et al. The application effect of wrist ankle acupuncture technique based on the meridian ebb flow theory in patients with acute ischemic stroke and hemiplegia. *Western Chinese Medicine*, 2022,35 (02): 111-114
- [16] Wu Qi "Clinical study of wrist ankle acupuncture combined with isokinetic muscle strength training in the treatment of elbow flexion spasm after stroke. *Anhui University of Traditional Chinese Medicine*, 2022. DOI: 10.26922/d.cnki.ganzc.2022.000200."
- [17] Zhao Chaoling Study on the Effect of Wrist Ankle Acupuncture Therapy on Upper Limb Function in Hemiplegic Patients with Cerebral Infarction of Wind Phlegm and Blood Stasis Type. *Nanchang University*, 2022. DOI: 10.27232/d.cnki.gnchu.2022.000965
- [18] Xu Sihuan Clinical observation on the efficacy of wrist ankle acupuncture combined with conventional acupuncture in the treatment of spastic hemiplegia after stroke. *Fujian University of Traditional Chinese Medicine*, 2022. DOI: 10.27021/d.cnki.gfjzc.2022.000390
- [19] Jin Yu, Wang Fei. Wrist ankle acupuncture for treatment of 30 cases of shoulder pain after stroke. *Journal of External Treatment of Traditional Chinese Medicine*, 2018, 27 (01): 38-39
- [20] Zhu Jie, Luo Yueqin. Observation on the efficacy of wrist-ankle therapy for patients with limb pain after stroke. *Clinical Research of Traditional Chinese Medicine*, 2019, 11 (07): 116-118
- [21] Chao Yu, Wang Min. Observation on the therapeutic effect of acupuncture and medicine on 33 cases of thalamic pain during recovery after ischemic stroke. *Hunan Journal of Traditional Chinese Medicine*, 2021,37 (03): 72-74. DOI: 10.16808/j.cnki.issn1003-7705.2021.03.025
- [22] Han Wencong, Huang Liyan, Li Manxiang, et al. Clinical efficacy of wrist ankle acupuncture combined with Kaitianmen in the treatment of stroke headache patients. *China Pharmacoeconomics*, 2021,16 (04): 41-44
- [23] Yu Mengting, Li Zhuangmiao, Yan Wenjuan, et al. Meta analysis of wrist and ankle acupuncture for the treatment of shoulder pain in stroke hemiplegia. *Clinical Research of Traditional Chinese Medicine*, 2022, 14 (15): 88-93
- [24] Zhuang Jingxiang Clinical observation on wrist and ankle acupuncture for treatment of hemisensory disturbance in stroke of qi deficiency and blood stasis type. *Fujian University of Traditional Chinese Medicine*, 2018
- [25] Fang Meifeng, Tan Feng, Zhang Xuwen. Clinical study of wrist ankle acupuncture combined with rehabilitation training in the treatment of hemisensory dysfunction after stroke. *Journal of Zhejiang University of Traditional Chinese Medicine*, 2018,42 (11): 971-974. DOI: 10.16466/j.issn1005-5509.2018.11.021
- [26] Fu Biao, Zhang Geng, Zhan Daliang. Observation on the therapeutic effect of wrist ankle acupuncture combined with mecobalamin on hemisensory dysfunction in ischemic stroke. *World Journal of Traditional Chinese Medicine*, 2019, 14 (09): 2492-2494
- [27] Zou Yulong, Song Yufan, Wang Hui, et al. Clinical effect of scalp acupuncture combined with wrist ankle acupuncture on patients with hemisensory abnormalities after stroke. *Medical Equipment*, 2020,33 (02): 1-2
- [28] Yan Kai, Xue Yuan, Yin Guirong. Clinical effect of wrist ankle acupuncture combined with mecobalamin on hemisensory dysfunction in patients with ischemic stroke. *Chinese Journal of Gerontology*, 2021,41 (18): 3917-3920
- [29] Shen Yinli, Wang Jieying. Clinical observation on nursing wrist ankle acupuncture therapy for relieving pain in patients with shoulder hand syndrome after stroke. *Sichuan Traditional Chinese Medicine*, 2019, 37 (11): 211-213

- [30] Jiao Lina, Liu Zhiqiang, Wang Yuhua. *Observation on the efficacy of wrist ankle acupuncture combined with Buyang Huanwu decoction in the treatment of shoulder hand syndrome after stroke. Journal of Practical Chinese Medicine*, 2020,36 (04): 434-435
- [31] Jiang Wanming, Tang Yunmei, Yan Jiamin. *Clinical analysis of wrist and ankle acupuncture combined with Wuzi heat dissipation ironing in the treatment of patients with shoulder hand syndrome after stroke and pain care. Chinese Community Physician*, 2021, 37 (24): 172-173
- [32] Li Ruiqing, Wang Yiyang, Mei Jinjin, et al. *Observation on the Phase I clinical efficacy of wrist ankle acupuncture in the treatment of shoulder hand syndrome after stroke. China acupuncture and moxibustion*, 2022,42 (07): 721-725. DOI: 10.13703/j.0255-2930.20210813-k0001
- [33] Zhang Nan *Clinical observation on the efficacy of wrist ankle acupuncture combined with conventional acupuncture in the treatment of shoulder hand syndrome after ischemic stroke in stage I. Tianjin University of Traditional Chinese Medicine*, 2022. DOI: 10.27368/d.cnki.gtzy.2022.0000371
- [34] Xu Jun, Huang Yisheng, Chen Min, et al. *The effect of wrist ankle acupuncture combined with Buyang Huanwu Decoction on the clinical efficacy and motor function of shoulder hand syndrome after stroke. Journal of Hubei University of Traditional Chinese Medicine*, 2022,24 (04): 97-99
- [35] Tang Qiaolu, Jiang Xianjun, Que Jianlan. *Observation on the therapeutic effect of wrist ankle acupuncture combined with rehabilitation training on swallowing disorders after stroke. Zhejiang Journal of Integrated Traditional Chinese and Western Medicine*, 2019, 29 (04): 295-298
- [36] Gui Meilin, Xiao Hongbo, Chen Ruiquan, et al. *Clinical Study on Wrist Ankle Acupuncture Combined with Vocastim Master Swallowing Therapy Instrument for Treating Swallowing Disorders after Ischemic Stroke. Hubei Journal of Traditional Chinese Medicine*, 2021,43 (04): 34-37
- [37] Wu Mengting, Chen Miao. *Clinical study of wrist ankle acupuncture combined with rehabilitation training in the treatment of poststroke dysphagia due to cyclopharyngeal muscle atony. China Grassroots Medicine*, 2023,30 (01): 68-71
- [38] Teng Haiyan, Yang Zhong. *Clinical Study of Wrist Ankle Acupuncture Therapy Combined with Electroacupuncture on Poststroke Constipation. Electronic Journal of Clinical Medicine Literature*, 2020,7 (09): 13-15. DOI: 10.16281/j.cnki.jocml.2020.09.007
- [39] Jiao Lina, Liu Zhiqiang, Wang Yuhua. *Wrist ankle acupuncture for treating 29 cases of insomnia after stroke. Guangming Traditional Chinese Medicine*, 2021,36 (08): 1302-1304
- [40] You Y, Zhang T, Shu S, Qian X, Zhou S, Yao F. *Wrist-ankle acupuncture and Fluoxetine in the treatment of post-stroke depression: a randomized controlled clinical trial. J Tradit Chin Med*. 2020 Jun; 40(3):455-460. doi: 10.19852/j.cnki.jtcm.2020.03.014. PMID: 32506860.