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Article

Electroacupuncture Therapy for Post-Stroke Speech Disorder with Yang Liver Hyperactivity Syndrome

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ABSTRACT

Stroke is a condition when blood flow in certain areas of the brain suddenly occurs damage to some brain cells which then experience death due to impaired blood flow due to blockage or rupture of brain blood vessels. One of the signs of symptoms arising from stroke is a speech disorder. Objective: To determine the effectiveness of electroacupuncture therapy with Tiantu points (CV 22), Lianquan (CV 23), Dicang (ST 4), Jianche (ST 6), Hegu (LI 4), Tongli (HT 5), (SP 6), Taixi (KI 3), Xingjian (LV 2), Taichong (LV 3) and additional therapy using scalp acupuncture in patients with post-stroke speech disorders. Management of post-stroke speech disorders by electroacupuncture methods at Tiantu (CV 22), Lianquan (CV 23), Dicang (ST 4), Jianche (ST 6), Hegu (LI 4), Tongli (HT 5), (SP 6), Taixi (KI 3), Xingjian (LV 2), Taichong (LV 3) and additional therapy using scalp acupuncture. The principle of therapy in this case is to strengthen Yin, calm the Heart, and improve the circulation of Qi and blood. Therapy is carried out in as many as 6 therapy sessions. The result measurement indicator uses the Barthel Index form. Electroacupuncture therapy as many as 6 therapy sessions is effective to increase the comfort of patient activities and the changes that occur are very significant.

I. INTRODUCTION

Stroke is a condition of cerebrovascular disease that occurs when blood vessels carrying oxygen and nutrients to the brain are obstructed by clots or ruptures of blood vessels in certain parts of the brain(1). Stroke is also a condition where clinical symptoms develop rapidly, involving a decrease in nerve function both locally and comprehensively(2). Clinical signs and symptoms of stroke include speech disorders such as dysarthria. Dysarthria is a condition where the muscles used for human speech experience weakness or difficulty in control (3). The neurological pathways involved in speech articulation include various brain structures such as upper motor neurons in the primary motor cortex and related areas, basal ganglia, cerebellum, as well as

cranial nerves such as CN V, VII, IX, X, and XII, as well as neuromuscular junctions and oropharyngeal speech muscles [4].Based on data collected by the World Stroke Organization, the prevalence of stroke includes 13.7 million new strokes diagnosed each year and approximately 5.5 million people dying as a result. About 70% of stroke cases and 87% of stroke-related deaths and disabilities occur in low- and middle-income countries[5].

In TCM, Stroke, known as Zhong Feng, is described as a disorder of the brain's blood vessels, characterized by symptoms resembling stroke, including paralysis on one side of the body, speech disorders, drooping of the mouth to one side, and related to wind pathogens [6]. Based on its clinical condition, Zhong Feng can be classified into two types: Zhong Jing Luo, indicating the disease occurring in the meridians, and Zhong Zang Fu, indicating the disease occurring within the Zang Fu organs. Zhong Feng that affects the meridians tends to have a shallower disease location and milder symptoms, such as hemiplegia, dysarthria, aphasia (stuttering speech, difficulty speaking), facial drooping, and others, accompanied by relatively inconspicuous consciousness disturbances[7]. Traditional Chinese medicine believes post-stroke dysarthria is categorized as "wind obstruction." It is believed that the root cause of post-stroke dysarthria involves an imbalance of Yin and Yang, as well as uneven Qi and blood distribution, along with blockages resulting in apnea [8].

Research indicates that the use of acupuncture alongside speech rehabilitation training can significantly improve the recovery process in patients with spastic dysarthria after a stroke, and the clinical efficacy in managing dysarthria can also be enhanced[8].

II. METHODS

This case study was conducted to determine the effectiveness of electro-acupuncture therapy management in Mr. D, a 63-year-old man with a weight of 60 kg and a height of 161 cm. Mr. D appeared enthusiastic, with bright eyes and a reddish complexion. The patient's body posture was not upright due to mobility impairments in the extremities and lack of energy when walking. Observation of the tongue revealed that the tongue muscles were red, fat, and tilted to one side, with tooth imprints and fissures. The tongue coating appeared yellowish and dry. A red tongue indicates heat, a yellow tongue coating indicates body heat and cracks on the tongue indicate heat in the body. Still, if the tongue is cracked and red, it indicates a deficiency of Yin syndrome and flaming fire, and a dry tongue indicates excess heat. Tooth imprints on the tongue, with a red tongue, indicate Spleen and Qi deficiency. A tongue pulled to one side suggests wind disturbance [9,10].

Mr. D's voice was loud but unclear (hoarse), and his breathing was regular. There was no coughing or sputum, and no hiccup sounds were heard. The patient's mouth odor and sweat were not smelled, and there were no signs of urine or stool odor. Loud speech indicates excess, while unclear speech indicates the disease has progressed to a more severe stage[9,10].

Mr. D complained of speech impairment (hoarse voice) after a stroke attack due to nervous system weakness (cranial nerves CN V, VII, IX, X, and XII). Dysarthria refers to a group of speech problems caused by disruptions in the strength, speed, range, and accuracy of tone or movement needed to control the processes of respiration, phonation, resonance, articulation, and prosody, all of which are aspects of speech production. These pathophysiological disorders are caused by abnormalities in the central or peripheral nervous system, which often present symptoms such as weakness, stiffness, lack of coordination, uncontrolled movements, or abnormalities in muscle movements, including excessive muscle movement, inadequate muscle movement, and erratic muscle movement [11].

Mr. D's bowel and bladder elimination patterns were normal, with a frequency of one bowel movement per day and seven urinations per day. Anamnesis on Mr. D's dietary status revealed a good appetite with a frequency of three meals per day, with a large portion consisting of two servings of rice (2 portions), with a tendency toward green vegetables or steamed foods such as tubers, a tendency toward salty taste, and a liking for snacking on chips. Mr. D drinks frequently with a volume of 2 liters daily, preferring cold beverages.

The patient's sleep pattern is slightly disturbed during sleep, and Mr. D also exercises in the morning by walking for 10 minutes. The emotional pattern tends to be irritable, and excessive anger is closely related to the Liver organ, where excessive anger can disrupt the flow of Qi and blood and also cause Qi and blood to rise upwards, leading to the rise of Yang Qi as well [9,12].

Examination of Mr. D's organ/ meridian status revealed symptoms such as high blood pressure, stiff neck, dizziness, anger, sleep disturbances, easy fatigue, extremity weakness, dry skin, knee pain, and graying hair. These symptoms are related to the liver/gallbladder system, heart/small intestine, spleen/ stomach, lung/large intestine, and kidney/ bladder systems.

The examination results of inspection and palpation on Mr. D's knees revealed no masses, muscle tension, or crepitus sounds, but the knees felt painful when used for walking. Palpation of Mr. D's pulse yielded data indicating superficial palpable depth, rapid pulse rate, large pulse size, and strong normal pulse strength. A fast pulse indicates an excess syndrome, while a large and strong pulse indicates excessive heat in the body. A floating, large, rapid, and full pulse indicates Zhengqi/body strength with Yang characteristics and resistance against pathogens, but the pathogen (Xie) persists [9,12].

The equipment used in this therapy process includes a sphygmomanometer, sterilized 1 cun needles, alcohol swabs, a bending tool, a safety box, hand sanitizer, and an electrostimulator. The acupuncture treatment was administered from August 26, 2023, to Saturday, September 30, 2023, with a frequency of 6 therapy sessions conducted once a week at Dewandaru Acupuncture Clinic in Klaten.

The acupuncture therapy used for the case of post-stroke speech disorder with Hyperactivity Syndrome of the Liver Yang involved needling at the points Tiantu (CV 22), Lianquan (CV 23), Dicang (ST 4), Jianche (ST 6), Hegu (LI 4), and Tongli (HT 5). According to the point theory of Tiantu (CV 22), Lianquan (CV 23), Tongli (HT 5), Sanyinjiao (SP 6), Taixi (KI 3), Xingjian (LV 2), Taichong (LV 3), additional therapy was performed using scalp acupuncture, with the patient in a supine position. The therapeutic principle in this case was to strengthen Yin, calm the Liver, and promote the circulation of Qi and blood. The therapy modality used an electrostimulator set at 20 minutes with a frequency of 80 Hz, dispersed wave, and intensity adjusted to the patient's comfort.

The outcome measurement indicator for therapy was assessed using the Barthel Index. The Barthel Index is a measurement tool that uses an ordinal scale to evaluate functional independence in personal care and mobility in individuals with chronic conditions and disabilities, particularly in rehabilitation. The main version of this index is the original 10-item version, which is commonly used in activities such as eating, transferring from a wheelchair to bed and vice versa, dressing, using the toilet, bathing, walking on flat surfaces, climbing up and down stairs, dressing, and controlling bowel and bladder movements. The Barthel Index is useful in evaluating the level of disability and monitoring changes in disability over time. When assessing, consideration is given to whether the individual requires assistance with each task. Scores for each

item are then summed to produce a total score, with higher scores indicating higher levels of independence[13].

III. RESULT

Therapy was evaluated at each therapy session to determine if there were any differences after the treatment compared to the previous session. The evaluation was done subjectively and objectively.

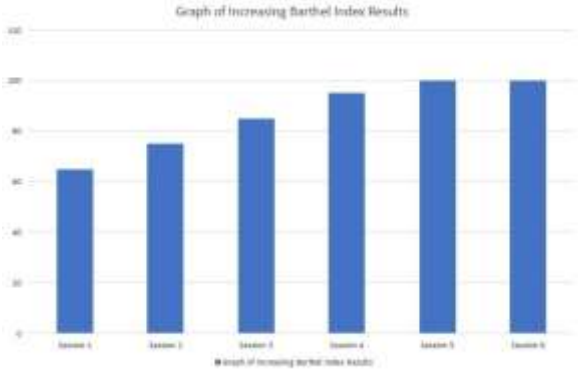

Figure 1. Improvement in Barthel Index results for Mr. D.

Table 1. Observation of Mr. D's Tongue Before and After Therapy

Stage	Image	Description
Before therapy		The tongue muscles are red and swollen, with tooth imprints, fissures, and a thin yellow coating.
After therapy		The tongue muscles are red and swollen, with tooth imprints and a thin white coating.

Table 2. Observation of Mr. D's Pulse Before and After Therapy

Stage	Right	Left
Before therapy	Cun superficial, fast normal guan, normal chi.	Cun superficial, fast Guan is normal, normal chi.
After therapy	Intermediate cun, normal guan, normal chi.	Intermediate cun, normal guan, normal chi.

The first therapy session was conducted on August 26, 2023. Mr. D complained of dysarthric speech after a stroke. Other complaints included mouth deviation, occasional choking when eating or drinking, drooling, dizziness, stiff neck, weakness, and fatigue in the legs and arms. Mr. D mentioned that besides acupuncture therapy, he also underwent speech therapy.

The second therapy session was conducted on September 2, 2023. Mr. D stated that there was a slight improvement after the first therapy session; although the speech was still dysarthric, there was still mouth deviation, occasional choking, and drooling, dizziness was gone, the stiff neck remained, and weakness and fatigue in the legs and arms persisted. Mr. D continued to undergo speech therapy once a week.

The third therapy session was conducted on September 9, 2023. After the second therapy session, the patient reported that the speech was becoming clearer, swallowing movements were no longer choking, drooling occurred less frequently, mouth deviation still existed, endurance increased, and weakness and fatigue in the legs and arms were reduced. Mr. D continued to undergo speech therapy once a week.

The fourth therapy session was on September 15, 2023. After the third

therapy session, the patient reported that the speech was clear, mouth deviation began to be symmetrical, no more choking or drooling, and a significant improvement in motor skills compared to previous therapy. Mr. D continued to undergo speech therapy once a week.

The fifth therapy session was on September 23, 2023. After the fourth therapy session, the patient reported that speech was clearer compared to the previous therapy, there was no more choking or drooling, tongue reflexes began to be symmetrical, mouth deviation was more symmetrical than before, motor skills were significantly improved, and the patient mentioned being able to ride a motorcycle independently. Mr. D continued to undergo speech therapy once a week.

The sixth therapy session was on September 30, 2023. Mr. D stated that there were many improvements after the fifth therapy session: speech clarity was significantly better than the previous therapy, no more instances of drooling or choking, mouth deviation, tongue reflexes were more symmetrical than before, and motor skills had greatly improved. Mr. D continued to undergo speech therapy once a week.

IV. DISCUSSION

To determine the acupuncture diagnosis through 4 examination methods and 8 basic diagnoses, including Wang (observation), Wen (listening & smelling), Wun (inquiry), and Cie (palpation). Data obtained from Wang: said to be Yang because the facial expression is red, the tongue muscles are red with viscera, the tongue surface is dry, the tongue membrane is yellow, said to be deficient because there are tooth marks. Wen: said to be Yang because the voice sounds loud but unclear. Wun: said to be deficient because there are complaints of weakness in both hands and feet, said to be Yang because the tongue membrane is yellow, the tongue muscles are red, there are viscera in the middle, and the tongue surface appears dry. Cie: Said to be Yang because the superficial pulse examination is rapid, large, strong, normal, and deficient because both hands and feet feel weak[9,12].

The diagnosis result of Mr. D, 63 years old, with complaints of dysarthria (pelo) after a stroke due to nervous system weakness, is acupuncture diagnosis of Yang Liver Hyperactivity Syndrome due to poor emotional management. Yang Liver Hyperactivity Syndrome has symptoms such as hemiplegia/hemiparesis, anger, headache/dizziness, stiff neck, mouth deviation, speech disorder, dizziness, red face, red tongue with yellow membrane, and tilting to one side, floating or tense pulse, rapid, and strong [9,14,15]. Excessive anger is closely related to the liver organ, where excessive anger can cause Qi and Blood flow to be obstructed. Anger causes the flow of Qi and blood to rise upwards, causing Yang Qi to rise upwards, thus causing dizziness [12,16].

This therapy utilizes main (symptommatic) and differential (causative) points. The main points used for cases of speech disorders include Tiantu (CV 22), Lianquan (CV 23), Dicang (ST 4), Jianche (ST 6), Hegu (LI 4), Tongli (HT 5) [9,17,18]. These points are chosen because they are local points for speech disorder indications. Regional points are used because they produce reflexes that stimulate specific primary nociceptive afferent A-delta fibers (including A-gamma and sometimes A-beta) and muscle nerves II and III. This triggers the release of CgRp, which releases vasodilators and 'neuropeptides,' chemical fluids that have local therapeutic effects[19]. Causative (Differential) points include Sanyinjiao (SP 6), Taixi (KI 3), Xingjian (LV 2), Taichong (LV 3). These points replenish Yin, calm Yang Liver Hyperactivity, and improve the flow of Qi and Blood[9,20]. Additional therapy uses scalp acupuncture for needling in the motor area. Scalp acupuncture stimulates functional zones of the brain, sensory,

memory, and motor [21]. The location of the motor area in Jiao's scalp acupuncture is above the anterior central convolution of the brain cortex. This line starts from a point (known as the motor area point) 0.5 cm posterior to the middle point of the anterior-posterior line of the head. It extends diagonally to the occipital line and the anterior boundary of the temporal hairline [22].

The modality used in this therapy is electrostimulation. Electrostimulation is set with a dispersed wave pattern, a frequency of 80 Hz, a therapy duration of 20 minutes, and electrostimulation intensity adjusted to patient comfort. Dispersed wave patterns function to increase muscle and ligament excitability and strength in cases of muscle injury [9].

V. CONCLUSION

The case study results show that electroacupuncture is effective for post-stroke speech disorders. Several improvements were noted when comparing the patient's condition before therapy to after undergoing therapy six times. This includes alleviating the patient's discomfort and decreasing the severity level of complaints measured using the Barthel Index form, with a score of 65 improving to 100, indicating independence, functional improvement, and satisfaction with the treatment.

REFERENCES

1. Kariasa IM. Antisipasi Serangan Stroke Berulang. Nasrudin, editor. Jawa Tengah: PT Nasya Expanding Management; 2022.
2. Susita O, Khiong TK. Biologi Molekuler Stroke Iskemik Ditinjau Dari Teori Medis Barat dan TCM. J Compr Sci [Internet]. 2023;2(5):1–14.
3. Melati AF. Gangguan Berbahasa Pada Penderita Disartria Dalam Kajian Neurolinguistik. Pros Senasbasa. 2019;3(2):35–43.
4. Aradi S, Cucchiara BL. Decision-Making in Adult Neurology. Cucchiara BL, Price RS, editors. Elsevier; 2021. p. 48–49.
5. Listari PR, Hidayah N, Setyowati E, et al. Kombinasi Kinesio Taping dan Proprioceptive Neuromuscular Facilitation (PNF) Terhadap Kekuatan Otot Ekstremitas Atas pada Pasien Stroke Iskemik: A Systematic Review. J Keperawatan. 2023;15(2085–1049):1031–44.
6. Yin G, Zhenghua L. Advanced Modern Chinese Acupuncture Therapy (A Practical Handbook for Intermediate and Advanced Study). Beijing: New World Press; 2002. 592 p.
7. Jie SK. Solusi TCM dalam Penyakit Saraf. Jawa Tengah: Situ Seni; 2021.
8. Wu ZJ, Hu KM, Guo YG, Tu YM, Zhang HY, Wang Y. Acupuncture Combined with Speech Rehabilitation Training for Post-Stroke Spasmodic Dysphonia: A Multicenter Randomized Controlled Trial. World J Acupunct Moxibustion. 2014;24(4):12–6.
9. Saputra K. Akupunktur Dasar. Surabaya: Airlangga University Press; 2017.
10. Jie SK. Dasar Terapi Ilmu Akupunktur: Identifikasi dan Klasifikasi Penyakit. Jakarta: Gramedia Widiasarana Indonesia (Grasindo); 2012.
11. Duffy JR. Motor Speech Disorders: Substrates, Differential Diagnosis, and Management. 3rd ed. Elsevier Health Sciences; 2013.
12. Jie SK. Dasar Teori Ilmu Herbal & Akupunktur: Identifikasi dan Klasifikasi Penyakit. Singapore: TCM Publication; 2012.
13. Ferrucci L, Koh C, Bandinelli S, Guralnik JM. Disability, Functional Status, and Activities of Daily Living. In: Birren JE, editor. Encyclopedia of Gerontology. 2nd ed. San Diego: Academic Press; 2007. p. 427–36.

14. Maciocia G. The Practice of Chinese Medicine: The Treatment of Diseases with Acupuncture and Chinese Herbs. Philadelphia: Churchill Livingstone Elsevier; 2017.
15. Xinghua B. Acupuncture in Clinical Practice. Beijing: Beijing College of Acupuncture and Moxibustion; 1996.
16. Liu Z. Essentials of Chinese Medicine. London: Springer; 2009.
17. Abdurachman. Mudah Akupunktur Melalui Anatomi. Yogyakarta: Arti Bumi Intaran; 2016.
18. Jin GY. Contemporary Medical Acupuncture: A Systems Approach. Beijing: Higher Education Press; 2006.
19. Maciocia G. Neuropuncture: A Clinical Handbook of Neuroscience Acupuncture. 2nd ed. London: Churchill Livingstone Elsevier; 2017.
20. Xuemin S. Acupuncture and Moxibustion. Beijing: Higher Education Press; 2007.
21. Xiaoxi L, Xuezhu Z, Kun N, et al. Effect of Electro-Scalp Acupuncture on Acute Ischemic Stroke: A Randomized, Single Masked, Trial. J Tradit Chinese Med. 2018;38(1):95–100. doi: 10.1016/j.jtcm.2018.02.012
22. Wang J, Pei J, Khiati D, et al. Acupuncture Treatment on the Motor Area of the Scalp for Motor Dysfunction in Patients with Ischemic Stroke: Study Protocol for a Randomized Controlled Trial. Trials. 2017;18(1):1–11.