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Acupuncture Care in Patients with Post-Stroke Dementia: A Case Report

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Abstract

Stroke remains a major global health concern due to its high mortality and disability burden, with post-stroke dementia emerging as a significant complication that affects cognitive function and patient independence. Acupuncture has been proposed as a complementary therapy to support neurological rehabilitation through its potential effects on cerebral blood flow, neuroplasticity, and cognitive recovery. This study aimed to describe the application of acupuncture care and evaluate changes in cognitive function in a patient with post-stroke hemorrhagic dementia using the Indonesian version of the Montreal Cognitive Assessment (MoCA-Ina). This study employed a descriptive case report approach involving a 60-year-old male patient diagnosed with post-stroke hemorrhagic dementia accompanied by chronic lacunar infarction and uncontrolled hypertension. The patient received acupuncture therapy three times per week for four weeks, resulting in a total of twelve treatment sessions. Cognitive function was assessed before and after the intervention using MoCA-Ina. The results demonstrated an improvement in the total MoCA-Ina score from 4 at baseline to 11 after acupuncture therapy. Improvements were observed in the naming, attention, language, abstraction, delayed recall, and orientation domains, while executive function remained unchanged. These findings suggest that acupuncture care may have potential benefits in supporting cognitive rehabilitation among patients with post-stroke dementia. However, further studies involving larger sample sizes and more rigorous research designs are required to confirm its clinical effectiveness and establish standardized acupuncture protocols for post-stroke cognitive rehabilitation.

INTRODUCTION

Stroke remains one of the leading causes of death and disability worldwide and represents a significant public health burden. The World Health Organization (WHO) reports that stroke is the second leading cause of death globally and one of the leading causes of long-term disability among adults. As life expectancy increases, the number of stroke survivors continues to rise, resulting in an increasing prevalence of post-stroke complications, including post-stroke dementia. This condition is characterized by cognitive decline that develops after a stroke and affects the ability to think, remember, communicate, and perform daily activities independently. Studies have shown that approximately 20–30% of patients develop dementia within the first year after stroke, while the risk increases among patients with recurrent stroke and chronic cerebrovascular disease (World Health Organization, 2024; Pendlebury & Rothwell, 2019;

Akinyemi et al., 2022). Consequently, post-stroke dementia has become a major challenge in neurological rehabilitation that requires comprehensive management.

The development of post-stroke dementia is influenced by various interrelated factors (Filler et al., 2024; MijajloviA et al., 2017). The most prominent risk factors include uncontrolled chronic hypertension, diabetes mellitus, dyslipidemia, atrial fibrillation, advanced age, smoking, obesity, and a history of previous strokes (Alharbi et al., 2019; Upoyo et al., 2021). In addition to these vascular factors, the presence of silent infarctions, small vessel disease, intracerebral hemorrhage, and multiple lesions in strategic brain regions, such as the frontal lobes, basal ganglia, hippocampus, and white matter, may further increase the risk of cognitive impairment. Long-term hypertension can cause endothelial dysfunction in cerebral blood vessels, reduce cerebral perfusion, and contribute to the development of lacunar infarctions that may remain undetected by patients (Santisteban et al., 2023; Wei et al., 2024). The accumulation of chronic vascular damage may then be exacerbated by acute stroke events, resulting in more extensive neuronal injury. Furthermore, neuroinflammation, oxidative stress, impaired neuronal energy metabolism, and reduced synaptic plasticity also contribute to the progression of post-stroke dementia (Wardlaw et al., 2019; Gorelick et al., 2020; Akinyemi et al., 2022).

These factors have significant consequences for both patients and healthcare systems. Cognitive decline may impair memory, attention, orientation, language abilities, executive function, and decision-making capacity. Patients may also experience reduced independence in performing daily activities, requiring long-term assistance from family members or caregivers. Additional consequences include increased hospital readmissions, higher rehabilitation costs, reduced quality of life for patients and families, and increased risks of depression, anxiety, and mortality (Religioni et al., 2025; Suksatan & Tankumpuan, 2021). At the healthcare system level, post-stroke dementia contributes to the growing economic burden associated with long-term rehabilitation needs. Therefore, rehabilitation interventions are required that not only focus on restoring motor function but also effectively address cognitive impairment in post-stroke patients (Feigin et al., 2022; World Stroke Organization, 2023).

Post-stroke dementia is a form of vascular neurocognitive disorder resulting from brain tissue damage caused by ischemic or hemorrhagic stroke. Injury to the frontal, temporal, basal ganglia, and subcortical regions disrupts neural networks involved in memory, attention, language, orientation, and executive functioning. Cognitive function is commonly assessed using the Montreal Cognitive Assessment (MoCA), an instrument with high sensitivity for detecting mild to moderate cognitive impairment. Currently, pharmacological interventions for improving cognitive function in post-stroke dementia remain limited in effectiveness, leading to increased interest in complementary therapies, including acupuncture. Previous studies have demonstrated that acupuncture may improve cerebral blood flow, enhance brain glucose metabolism, increase the expression of Brain-Derived Neurotrophic Factor (BDNF), promote neurogenesis, enhance synaptic plasticity, and reduce inflammatory processes and neuronal apoptosis. These mechanisms suggest that acupuncture may support cognitive recovery in post-stroke patients and may be integrated into neurological rehabilitation programs (Chang et al., 2020; Wang et al., 2022; Zhao et al., 2023).

Although numerous studies have investigated the effectiveness of acupuncture for post-stroke cognitive impairment, most have focused on clinical trials involving ischemic stroke

populations. Meanwhile, case reports describing acupuncture therapy in patients with post-stroke hemorrhagic dementia involving both acute and chronic brain lesions remain limited. Furthermore, few studies have documented detailed changes in cognitive function using the Indonesian version of the Montreal Cognitive Assessment (MoCA-Ina) among patients with combined chronic and acute brain injuries, such as chronic lacunar infarction (silent infarction) accompanied by acute hemorrhagic stroke without significant motor impairment. Therefore, the novelty of this study lies in documenting acupuncture care as a complementary therapy for a patient with post-stroke hemorrhagic dementia involving chronic and acute structural brain abnormalities, with cognitive improvement evaluated using MoCA-Ina following regular acupuncture therapy. This study is expected to contribute additional evidence regarding the potential role of acupuncture in post-stroke neurocognitive rehabilitation.

This study has significant urgency considering the increasing prevalence of stroke and the growing number of stroke survivors worldwide, while post-stroke cognitive impairment continues to receive less attention compared with motor rehabilitation. Untreated or inadequately managed cognitive decline may hinder the rehabilitation process, reduce quality of life, increase patient dependence on family members, and elevate healthcare costs. Meanwhile, acupuncture represents a complementary therapy that is generally considered safe, has minimal adverse effects, can be combined with conventional medical treatments, and has been investigated as part of neurological rehabilitation strategies. Therefore, documenting the outcomes of acupuncture care in patients with post-stroke dementia is important for supporting the development of evidence-based practices in integrative healthcare services.

Based on this background, this study aimed to describe the implementation of acupuncture care in a patient with post-stroke hemorrhagic dementia and evaluate changes in cognitive function following acupuncture therapy using the Indonesian version of the Montreal Cognitive Assessment instrument (MoCA-Ina). Furthermore, this study aimed to provide an overview of the potential role of acupuncture as a complementary therapy supporting the neurocognitive rehabilitation process in patients with post-stroke dementia.

The findings of this study are expected to provide both theoretical and practical contributions. Theoretically, this study may enrich the scientific literature regarding the potential role of acupuncture in the rehabilitation of patients with post-stroke dementia, particularly in cases involving hemorrhagic stroke with a history of chronic lacunar infarction. Practically, the findings may serve as a reference for healthcare professionals, including acupuncturists, physicians, and rehabilitation specialists, in considering acupuncture as a complementary intervention to support cognitive recovery among post-stroke patients. In addition, this study may provide a foundation for future research using stronger study designs and larger sample sizes to further establish scientific evidence regarding the benefits of acupuncture in post-stroke dementia management.

METHOD

Research Design

This study employed a descriptive research design with a case report approach to describe the implementation of acupuncture care in a patient with post-stroke dementia and evaluate changes in cognitive function following acupuncture therapy. The case report approach was selected to provide a comprehensive description of the patient's clinical condition, therapy

implementation, response to intervention, and changes observed during the treatment period. The study did not aim to examine causal relationships or compare treatment effectiveness between groups; rather, it focused on presenting clinical findings regarding the application of acupuncture as a complementary therapy for post-stroke dementia. The research process was conducted systematically, including patient assessment, identification of clinical problems, therapy planning, acupuncture intervention, and evaluation of cognitive function using clinical examinations and standardized assessment instruments. Through this approach, the study aimed to provide clinical insights into the potential role of acupuncture therapy in supporting neurocognitive rehabilitation in patients with post-stroke dementia.

Research Location and Time

The research was carried out at an acupuncture service clinic where patients underwent rehabilitation after hospital treatment due to hemorrhagic strokes. The entire series of data collection was carried out from the time the patient started acupuncture therapy until all therapy sessions were completed. Data collection includes the results of anamnesis, physical examinations, supporting examinations, medical records, results of cognitive function evaluation, and documentation of patient development during therapy. The implementation of therapy was carried out on a scheduled basis three times a week for one month so that a total of twelve acupuncture therapy sessions were obtained. During this period, continuous observation of changes in the patient's condition was carried out to obtain objective data on the development of cognitive function after receiving the intervention.

Research Subject

The subject in this study was a 60-year-old male patient diagnosed with post-stroke hemorrhagic dementia with a history of uncontrolled chronic hypertension. Radiological examination showed bleeding in the left occipital lobe and bilateral frontal accompanied by a long laxative infarction of the basal left ganglia and bilateral frontal. Although the patient's motor condition is still excellent with normal muscle strength in all extremities, the patient experiences impaired cognitive function in the form of aphasia, disorientation of place, memory impairment, and decreased thinking ability leading to the diagnosis of vascular dementia. Patients were chosen as study subjects because they met the characteristics of the case in accordance with the purpose of the study, which was to describe the application of acupuncture care in post-stroke dementia patients with dominant cognitive impairment without being accompanied by severe motor impairment. Before the research was carried out, the patient's family had given approval to the use of clinical data as research material so that the entire research process still paid attention to ethical aspects and confidentiality of the patient's identity.

Acupuncture Care Procedures

The implementation of acupuncture care begins with a thorough assessment of the patient's condition which includes anamnesis, physical examination, medical record review, laboratory examination results, radiological examination, and neurological examination results. Based on the results of the assessment, an acupuncture therapy plan was prepared by considering the clinical condition, medical diagnosis, and therapeutic principles in traditional Chinese medicine. Therapy was carried out using a sterile disposable acupuncture needle of the Huanqiu brand measuring 0.25 × 25 mm with an action procedure that began with disinfection of the puncture area using 70% alcohol. The selected acupuncture points are focused on the head (scalp acupuncture) and several body points that play a role in improving neurological

function, improving cerebral blood circulation, stimulating cognitive function, and calming the nervous system. The main points used include Baihui (GV20), Sishencong (EX-HN1), Shenting (GV24), Neiguan (PC6), and Taichong (LR3). The needle was maintained for thirty minutes at each therapy session with a frequency of three times every week for four weeks for a total of twelve treatments. During the therapy process, observations were made of the patient's response as well as the possibility of side effects related to acupuncture actions.

Research Instruments

The main instrument used in this study is the Indonesian version of the Montreal Cognitive Assessment (MoCA-Ina) which is a cognitive function screening instrument with a high level of sensitivity in detecting cognitive impairment in stroke patients. This instrument assesses several domains of cognitive function which include executive function, naming, attention, language, abstraction, delayed memory, orientation, and visuospatial ability so as to be able to provide a comprehensive picture of the patient's cognitive condition. In addition to MoCA-Ina, research data was also obtained through the results of anamnesis, physical examination, medical records, laboratory results, CT-scan examination of the head, and the results of neurological examinations used to support the interpretation of the patient's clinical condition during acupuncture therapy.

Data Collection and Analysis

Data collection was carried out in stages from before the intervention until all therapy sessions were completed. Basic data were obtained through interviews with the patient's family, direct observation of the patient's condition, physical examination, review of medical records, and results of supporting examinations. Furthermore, cognitive function assessment was carried out using MoCA-Ina before therapy as a baseline and repeated after the entire series of therapy was completed to determine the changes that occurred. The data that has been obtained is then analyzed descriptively by comparing the results of the examination before and after therapy. Analysis was carried out on changes in total scores and each cognitive domain in MoCA-Ina so that aspects of cognitive function that improved after acupuncture therapy were identified. The results of the analysis are then presented in the form of narrative descriptions and tables to provide a clearer picture of the development of the patient's condition during acupuncture care.

RESULTS AND DISCUSSIONS

Case Report

An anamnesis was performed on a 60-year-old male patient who was brought by his family to receive post-treatment rehabilitative therapy at the hospital due to an acute hemorrhagic stroke.

Clinical Data and Supporting Examinations

Radiological Examination (CT Brain Scan): Showed a bleeding volume of 15.33 cc in the area of the left occipital lobe and bilateral frontal lobe. It was also found that there was an *old lacunar infarction* in the basal area of the left ganglia and bilateral frontal. This old infarction condition is *silent infarction*, where the family does not know its existence at all before this acute stroke attack occurs.

Medical History: The patient has a history of comorbidities in the form of uncontrolled chronic hypertension. The patient is known to have never taken antihypertensive drugs regularly.

Motor Status: Very excellent, with muscle strength valued at 5/5 in all extremities. No hemiparesis or physical paralysis was obtained.
Cognitive and Behavioral Status: Patients experience severe post-stroke cognitive impairment. Manifestations that appear include aphasia (speech/language disorders), obvious disorientation of the place, and a clinical diagnosis leading to vascular dementia.

Medical Intervention and Acupuncture:

After discharge from the hospital, at the request and consent of the family, the patient receives combination therapy in the form of standard oral medications from a neurologist as well as acupuncture therapy interventions.

Acupuncture therapy is done regularly (at least 2-3 times a week). The determination of acupuncture points is based on the principle of syndrome differentiation to nourish the brain (*Nourish the Brain*), smooth the meridians, and calm the soul (*Shen*). The main points applied include a combination of *scalp acupuncture* on the cognitive/motor functional area, as well as specific body points such as *Baihui* (GV 20), *Sishencong* (EX-HN1), *Shenting* (GV 24), *Neiguan* (PC 6), and *Taichung* (LR 3) to regulate blood circulation and reduce post-stroke excitoxicity.

Results (MoCA-Ina Evaluation)

Cognitive function assessment was carried out before acupuncture intervention began (*baseline*) and was re-evaluated periodically using the *Indonesian version of the Montreal Cognitive Assessment* (MoCA-Ina) score instrument. The results of the sub-score comparison show the following changes:

Domain Kognitif MoCa-Ina	Before Score Terapi (Baseline)	Post-Therapy Score	Changes
Executive Functions	0	0	Fixed
Naming	1	2	Increased (+1)
Memory	0	0	Not counted
Attention	1	2	Increased (+2)
Language	0	1	Increased (+1)
Abstraksi	1	2	Increased (+1)
Memory Delay	1	2	Increased (+1)
Orientation	0	2	Increased (+2)
Total Skors	4	11	Increased (+7)

The patient in this case report presents a unique clinical condition, in which there is *a double hit* or double damage to his brain tissue. First, chronic damage due to lacternal infarction in the basal left and bilateral frontal ganglia caused by long-term uncontrolled hypertension. Second, acute damage in the form of a hemorrhagic stroke of 15.33 cc in the left occipital and bilateral frontal lobes.

The involvement of the bilateral frontal area (both as a result of old infarction and new bleeding) is a major explanation for why patients develop severe vascular dementia and aphasia, as the frontal lobe is responsible for high levels of cognitive function, language initiation, and orientation. Interestingly, the patient's motor pathway (corticospinal tract) was completely indented, as evidenced by the perfect value motor status (5/5). This phenomenon confirms that

the focus of rehabilitation in these patients is purely shifted from physical rehabilitation to cognitive rehabilitation.

The use of the MoCA-Ina instrument showed good sensitivity in monitoring the patient's cognitive progression. Although the executive function sub-score still remained at 0—which correlated with the severity of permanent structural damage in the bilateral frontal lobe due to chronic infarction and hemorrhage—other domains showed promising improvements.

The increase in the total score from 4 to 11 (up 7 points) for patients and their families is really very meaningful. Improvements in the Attention (1 to 2) and Orientation (0 to 2) domains indicate an improvement in environmental awareness and focus. Improvements in the Language (0 to 1) and Naming (1 to 2) domains showed positive stimulation in the speech area (possible plasticity in the area around the lesion in the left hemisphere).

In terms of biomolecular mechanisms, acupuncture needle stimulation on head points such as *Baihui* (GV 20) and *Sishencong* (EX-HN1) has been widely proven in various literature studies to activate the cerebral cortex, increase the expression of *Brain-Derived Neurotrophic Factor* (BDNF), increase glucose metabolism in the brain, and modulate neurotransmitters such as acetylcholine which are crucial for memory and attention processes. This acupuncture nursing therapy improves the window of brain plasticity of post-stroke patients.

CONCLUSION

This case report demonstrated that acupuncture care as a complementary therapy had the potential to support cognitive rehabilitation in a patient with post-stroke hemorrhagic dementia. The patient, who experienced cognitive impairment due to a combination of chronic lacunar infarction and acute hemorrhagic stroke, showed improvement in cognitive function after receiving twelve acupuncture therapy sessions over four weeks. The MoCA-Ina assessment indicated an increase in the total cognitive score from 4 at baseline to 11 after therapy, with improvements observed particularly in attention, orientation, language, naming, abstraction, and delayed recall domains. Although executive function remained unchanged, possibly due to irreversible structural damage in the bilateral frontal regions, the observed cognitive improvements suggested that acupuncture may contribute to supporting neuroplasticity and recovery processes in post-stroke cognitive impairment. However, because this study was conducted using a single case report design, the findings should be interpreted as preliminary clinical observations rather than definitive evidence of therapeutic effectiveness.

Future studies should investigate the effectiveness of acupuncture therapy in patients with post-stroke dementia using stronger research designs, such as randomized controlled trials or prospective cohort studies, involving larger and more diverse patient populations. Further research should also examine optimal acupuncture protocols, treatment duration, session frequency, and specific acupuncture points associated with cognitive improvement. In addition, future investigations should incorporate objective biomarkers, neuroimaging assessments, and longer follow-up periods to evaluate the mechanisms underlying acupuncture-related neuroplasticity and determine whether cognitive improvements can be sustained over time. Comparative studies evaluating acupuncture combined with standard rehabilitation versus standard therapy alone are also needed to establish the clinical value of acupuncture as an evidence-based complementary intervention in post-stroke dementia rehabilitation.

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