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Combination of Body Acupuncture with Scalp and Ear Micro acupuncture in Treating Alzheimer's Dementia in Elderly: A Case Report

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Abstract

Impairment in multiple domains of cognitive function is referred to as dementia. Alzheimer's dementia (AD) is the most prevalent cause of dementia. AD is associated with the influence of amyloid, oxidative stress, as well as abnormal phosphorylation of the protein Tau which forms neurofibrillary plaques in neurons. Clinical symptoms include progressive memory impairment for current events, cognitive impairment, general confusion, agitation, delusions, social disinhibition, and paranoia. This case report was using manual acupuncture as an adjuvant treatment in the Alzheimer's dementia to improve cognitive impairment of the patient. A 68-year-old man complained of rapid forgetfulness and decreased cognitive function accompanied by insomnia. Acupuncture manual therapy was performed at points GB20, LI4, HT7, KI3 bilaterally and EX-HN1, EX-HN3, GV20, CV9, CV4, CV3. Combine with scalp acupuncture Zhu Scalp Head and Face, as well as bilateral anterior hypothalamus and master cerebral ear points. Electroacupuncture 2 Hz continuous wave electroacupuncture at points ST25-ST28, CV12-CV6, and ST36-SP6. Therapy is carried out 2 times a week. Evaluation using MMSE and PSQI. After 10 treatments, there was improvement in clinical symptoms, MMSE and PSQI scores. Manual acupuncture and electroacupuncture, a combination of body points, scalp and ear microcupuncture are useful in the management of Alzheimer's dementia accompanied by insomnia as non-pharmacological adjuvant therapy with improvement on MMSE and PSQI score and also clinical symptoms.

***Keywords**: Manual acupuncture, electroacupuncture, scalp micro acupuncture, ear micro acupuncture, Alzheimer's dementia*

Introduction

Cognitive decline is a hallmark of dementia, a condition of long-term, acquired, and progressive cognitive impairment, that is common in the elderly, especially those aged 65 years and over. Alzheimer's disease is becoming more prevalent due to the global aging population (AD). The World Alzheimer Report estimates that 50 million people suffered from dementia worldwide in 2018, this number is expected to continue to increase to 74.7 million in 2030 and will reach 152 million in 2050. In 2019, AD was reported as the sixth leading cause of death, the largest among all age groups. Dementia affects about 3% of people aged between 65 and 74 years, 19% of those aged 75 and 84 years, and almost half of those aged over 85 years. Alzheimer's dementia (AD) and vascular dementia (VD) are the most common forms of dementia, accounting for 60–75% and 25% of all cases (Ma et al., 2021; Pasqualetti et al., 2022; Yu et al., 2020).

The primary risk factors for the pathophysiological pathways of AD are thought to be genetic inheritance, oxidative stress, amyloid deposition, and abnormal Tau protein phosphorylation. Insomnia is common among AD patients. This is due to the reciprocal link between AD and sleep disturbances. Shorter sleep duration and lower quality of sleep are two effects of disrupted sleep-wake cycles caused by increased amyloid-β accumulation. In the neocortex, intracellular tau aggregation and amyloid-β deposition are linked to poor sleep quality. Furthermore, the accumulation of tau and amyloid-β proteins in the brain is accelerated by sleep deprivation or fragmentation. The relationship between these two factors contributes to the severity of the disease (Roth & Brunton, 2019).

As of right now, dementia cannot be specifically treated with medication. Acetylcholinesterase inhibitors (Donepezil, Rivastigmine, and Huperzine-A), N-methyl-D-aspartate receptor

antagonists (Memantine), and brain metabolic activators (Oxiracetam) are the main treatments now being used to improve cognitive function. Nevertheless, nausea, vomiting, and appetite loss are some of the adverse effects of these medications. Thus, there is still a need for efficient alternative treatments that might lessen symptoms and slow the advancement of the disease (Ma et al., 2021; Yu et al., 2020).

However, an increasing amount of research is pointing to acupuncture's effectiveness in treating AD. The following can be modulated by acupuncture: autophagy, neuronal apoptosis, neuroinflammation, brain glucose metabolism, neurotransmitters, neurogenesis, synapse and neuron function, tau phosphorylation, Aβ metabolism, and brain responsiveness. Randomized controlled trials (RCTs) have been used to evaluate the impact of acupuncture on dementia. The results suggest that the mechanism of acupuncture may be associated with changes in neurotransmitters, anti-free radicals, inflammatory factors, excess Ca2+ reduction, and inhibition of cell apoptosis (Ma et al., 2021; Yu et al., 2020).

In this case report, we will be presenting and discussing the effectiveness of acupuncture therapy using manual acupuncture (MA) and electroacupuncture (EA) methods using a combination of body points, scalp, and ear microacupuncture in elderly patients with AD accompanied by insomnia.

Case Illustration

A 68-year-old contractor named Mr. HS arrived at the RSCM medical acupuncture clinic with his spouse, complaining of forgetfulness that had been bothering him for the past eight years. The patient can take four showers a day since, according to his wife, he frequently forgets fresh information, such as whether he has eaten or taken a shower today. The patient can mention the location, albeit insufficiently, but is unable to precisely state the day, date, and year. The patient can still recall his name and birthdate. In the last eight years ago, there have been complaints, and throughout the past year, they have gotten worse. Additionally, patients are more prone to be quiet and simply perform everyday tasks at home. Sleep frequently wakes up abruptly, although it can return. The patient reportedly claimed to see people, but in reality, he was experiencing visual hallucinations, according to his family. The patient remains able to care for himself but occasionally needs reminders from his wife. He responded well to questions about his condition, though his responses were somewhat delayed during the examination. An MMSE score of 15 suggests cognitive decline, while a PSQI score of 11 points to insomnia. His regular medications include Pletaal SR 100 mg twice daily, Vitamin B6, B12, Folic acid twice daily, Simvastatin 20 mg once daily, Donepezil 10 mg once daily, Abixa 10 mg once daily, and Quetiapine 150 mg once daily as prescribed by his psychiatrist. The results of the Neurological and Neuropsychological Examination (February 2023) by Neurologist showed that there were disturbances in attention, orientation, immediate memory, disturbances executive function (working memory, calculation, abstraction, psycho/visuomotor speed, set shifting, slowed thought processes), visuoconstruction disorders, visual hallucinations according to early onset of Alzheimer's dementia with BPSD.

Patients received manual acupuncture therapy at head EX-HN1, EX-HN3, GV20, GB20, upper extremity LI4, HT7, PC6, abdomen ST25, ST28, CV12, CV9, CV6, CV4, CV3, lower extremity ST36, SP6, KI3 bilaterally. Manual acupuncture was applied using rotation methods every 5 minutes for points that were not stimulated by electroacupuncture. This patient also undergoes micro acupuncture zhu scalp head and face and ear acupuncture at the anterior hypothalamus and master cerebral bilaterally. A 2 Hz continuous wave electroacupuncture was done at points ST25-ST28 and ST36-SP6 bilaterally, as well as CV12-CV6. All the treatments took 20 minutes of retention for manual and electroacupuncture and 30 minutes for micro acupuncture. The patient was educated to schedule routine acupuncture 2x/a week, light physical exercise and brain exercises, and also have a healthy and balanced diet. This patient undergoes ten sessions of therapy in 2 months.

Discussion

In this case report, the role of manual body acupuncture combined with body electroacupuncture and scalp and ear microacupuncture in treating Alzheimer's Dementia accompanied by insomnia in a 68-year-old man complained of easy forgetfulness, especially current memories, accompanied by difficulty sleeping. Enforcement of the working diagnosis in this case report is through history taking, physical examination, examination of the MMSE (Mini-mental state examination) questionnaire, and PSQI (Pittsburgh Sleep Quality Index). From the results of the MMSE questionnaire, it can be concluded that the patient experienced a decline in cognitive function in the moderate category (MMSE score 15) and also insomnia with a PSQI score of 11.

Acupuncture treatment in this patient used manual and electroacupuncture modalities, a combination of body points, with head and ear microacupuncture. Acupuncture can alter the structural and functional characteristics of synaptic plasticity by modulating synaptic proteins, and inhibiting inflammatory responses in neural pathways. Local acupuncture points such as GV20, GB20, EX-HN1, EX-HN3, and scalp acupuncture primarily work to increase brain blood flow, reduce inflammation, and increase brain synapse plasticity (Wu et al., 2024). Remote acupuncture points such as CV12, CV6, SP10, and ST36, SP6 were proven in vitro tests to increase SYN expression, promote nerve regeneration and synaptogenesis, repair damaged neurons, and improve memory(Zhao et al., 2020). In addition, acupuncture at the GV20 point can improve memory by increasing GAP-43 activity, thereby reducing synaptic deficits and increasing synaptic plasticity. Electroacupuncture stimulation at GV20, ST36, also inhibits the production of inflammatory factors such as IL-1β and IL-6 (Du et al., 2022).

An RCT by Jia, 2017 using points CV4, CV6, CV12, ST25, ST36, LR3, for 12 weeks, with a frequency of 3x/week, for 30 minutes. The RCT compared acupuncture therapy + donepezil 5-10mg with donepezil alone and found that both groups gave significant results in reducing the ADAS-COG (The Alzheimer's Disease Assessment Scale-Cognitive Subscale) and CIBIG (Clinician Interview-Based Impression of Change) scores with $p < 0.05$ and there was no significant difference between the two treatment groups with $p > 0.05$ (Jia et al., 2017).

Tabel 1. Patient follow-up progress

First session	Patient's spouse said that He often forgets new and old events, such as whether he has eaten today, and is disoriented to time and place, but still remembers his name and date of birth. Patients also tend to be quiet, often wake up suddenly but can fall asleep again.
Second session	Patient's spouse reported that following acupuncture, He increased in activity, started being able to have discussions and started moving more often (walking) than before. Patients still often forget new and old events, there is disorientation in time, but they still remember their name and date of birth.
Third session	Patient can name places, there is disorientation in time, but still remembers his name and date of birth. Patient's spouse said she was sleeping better and waking up less often than before.
Fourth session	Patients are more active, are starting to be able to have discussions and are starting to move more often (walking in the yard) than before. Patient can name places, there is disorientation in time, but still remembers his name and date of birth. Sleeping is more sound, and~~,~~ wake up less often than before.
Fifth second	Patients become more active, discussing and providing solutions, starting to move more often (walking in the yard) than before. Sleep soundly, don't wake up at night
Sixth session	Patient is calmer, willing to follow orders. Increased appetite 5 times a day. Patients still often forget new events, can name places, can state the child's name, past memories, name and date of birth, although there is disorientation in time. No problem in sleeping.
Seventh session	During the consultation at the neurological clinic, patient was able to mention the day, date, date of birth and name, and began to move more often (walking in the yard) than before. Already calmer, willing to follow orders. Increased appetite
Eighth session	Patient couldn't sleep last night and woke up 3 times, and there were visual hallucinations, He was on holiday with his grandchildren and patient's spouse informed him because he was annoyed with his grandchildren. Previously the patient was calmer.
Ninth session	Patient sleeps soundly, can say places and days, names of objects, dates of birth, recall 3 words, year is still not correct, appetite has increased since acupuncture to 5 times a day.
Tenth session	Patients move more actively, interact more with children, grandchildren and extended family, want to listen to music, actively discuss and provide solutions

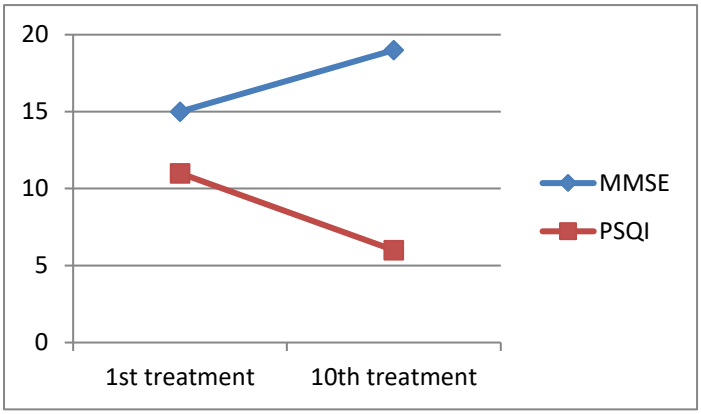

Figure 1: Changes in MMSE and PSQI scores after 10 treatments

The basis for scalp microacupuncture is the somatotopic reflex system on the scalp's surface, which transports endocrine and central nervous system functions to and from the scalp's surface. Scalp microacupuncture zones directly affect the cerebral cortex, cerebellum, thalamic-cortical circuit, thalamus, hypothalamus, and pineal body. They correlate to cortical areas in the cerebrum and cerebellum that are in charge of central nervous system tasks like motor activity. In neurological cases, scalp acupuncture has good efficacy and can repair nerve cell damage. In the Zhu scalp microacupuncture method, the head and face area is a 1 cun square area centered at GV24 and extending 0.5 cun to the right, left, front, and back, this area functions as a calmer and also corresponds to abnormalities in the frontal lobe area of the brain which is the cognitive center (Hao et al., 2012).

SR-MA by Kwon, et al, 2018 (Kwon et al., 2018) using 12 RCTs, When compared to the conventional medication, AA (auricular acupuncture) exhibited inconsistent results on the Mini-Mental State Examination [MMSE] cognitive performance. However, when paired with standard medications, AA showed higher rates of clinical success (risk ratio [RR] 1.42, 95% CI 1.06–1.91) in patients with dementia. No harmful side effects associated with AA have been reported. The MMSE score before the first acupuncture therapy was 15. After 10 times acupuncture therapy there was an improvement in symptoms, and the MMSE score rose to 19. According to Andrews, et al, an increase of 1-2 points in the number of boxes on the clinical dementia scale and

an increase of 3-5 points on the activity questionnaire functional function is an indication of a significant reduction in AD clinical symptoms (Andrews et al., 2019) Complaints of difficulty sleeping with a PSQI score of 11 before acupuncture therapy reduced to 6 after the 10th session. A four-point reduction in the SDI is considered the minimum meaningful and beneficial change for dementia patients experiencing insomnia (Webster et al., 2020).

Evidence of acupuncture in the management of dementia in a SR-MA by Ma, et al (Ma et al., 2021) involving 13 SRs (137 RCTs and 9012 participants), The findings demonstrate that acupuncture is beneficial in treating dementia in terms of efficacy, cognitive function, and activities of daily life. with varying durations ranging from 4 to 24 weeks, although there is a high level of heterogeneity due to the lack of standardized therapy protocols, frequency, and duration used in each RCT. The modalities used in SR-MA vary between MA, a combination of MA, EA, scalp, and a combination of the three. The safety of acupuncture is significantly higher compared to medication. There were no therapeutic side effects complained by patients. Acupuncture therapy is a relatively safe and effective therapy for the elderly. Continued therapy sessions are needed to get optimal improvement in cases of Alzheimer's dementia

Conclusions

Manual acupuncture and electroacupuncture, a combination of body points, scalp, and ear microacupuncture are useful in the management of Alzheimer's Dementia accompanied by insomnia as non-pharmacological adjuvant therapy with improvement in outcome MMSE and PSQI. Further research is needed using a larger sample and more objective clinical trial methods.

Conflict of interest

The author declares that there is no conflict of interest in this research

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