



Research Article

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BENEFICIAL EFFECT OF MANUAL-ACUPUNCTURE IN LIMITING COGNITIVE CHANGES IN TYPE-2 DIABETIC PATIENTS

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ABSTRACT

Though acupuncture has been used for management of cognitive impairment, high quality evidence is lacking to support this therapy. The present study was designed to assess beneficial effects of manual acupuncture in limiting cognitive decline in diabetic patients. Thirty cases of controlled type II diabetes mellitus and thirty age matched healthy individuals (controls) of either sex were included in the present study after obtaining informed consent. After recording baseline parameters (pre-intervention values), intervention was administered to the cases for weekly three days (alternative days) for 3 months. After 3 months, post intervention post intervention values were recorded and compared. Cognition was assessed by using spatial and verbal memory test and MMSE. Our study supports to advocate the acupuncture as a treatment to improve cognitive function. We recommend further detailed study in this area to provide high quality evidence to support the acupuncture in the management of diabetes and its complications.

Key Words: Acupuncture, Diabetes, Cognition, Memory.

INTRODUCTION

In Chinese tradition, acupuncture was commonly practiced in the management of diabetes.¹ In acupuncture, a fine needles into the skin to activate certain points for therapeutic purpose. According to the Acupuncture, the health status depends on the balance and energy levels in the body and stimulating particular points can correct the imbalances in the flow of Qi through channels known as meridians.² Manual acupuncture is widely practiced type of acupuncture, where needles are inserted to acupoints.³ The prevalence of diabetes is being increased among Indian population and soon it was expected that India become diabetic capital of the world.⁴ Diabetes was considered as a risk factor for cognitive impairment⁵ and cognitive decline is one of the complications of Diabetes.⁶ It was reported that acupuncture is not only effective in reducing blood glucose but also effective in treating the complications of diabetes.^{7,8} Though the exact mechanism of action of acupuncture was still not clear, it was reported that, acupuncture lowers blood glucose levels directly by acting on pancreas and also through hypothalamus.⁹ Though acupuncture has been used for management of cognitive impairment, high quality evidence is lacking to support this therapy. The present study was designed to assess beneficial effects of manual acupuncture in limiting cognitive decline in diabetic patients.

MATERIALS AND METHODS

Study design: Case control study

Patients and controls

Thirty cases of controlled type II diabetes mellitus and thirty age matched healthy individuals (controls) of either sex were included in the present study after obtaining informed consent. The following criteria were followed while recruiting the cases:

1. Controlled diabetic patients (fasting blood sugar levels \leq 126 mg/dl and post prandial blood sugar level \leq 180mg/dl), attending our diabetic clinic for regular check up
2. Having diabetes at least one year duration and those on diabetic diet and oral hypoglycemic agents
3. Not suffering with any other complications or diseases.

Unwilling participants and participants with any severe complications, cancer, pulmonary tuberculosis, and rheumatoid arthritis and those with vestibular or ear disorders were excluded from the study. All the healthy participants and patients were subjected to general and physical examination. Cognition tests were carried out in the morning at 9 am, after familiarizing the participants with the procedures. After recording the baseline parameters (pre-intervention values), intervention was administered to the cases for weekly three days (alternative days) for 3 months. After 3 months, post intervention post intervention values were recorded and compared.

Laboratory setting

The present study was carried out at Yes 4 Health Hospital, Hyderabad, Telangana, India. The patients were instructed to follow strict diabetic diet and not to consume alcohol and other caffeinated beverages and not to smoke during the study duration.

Intervention

Acupoints

The acupoints used in the study are Pishu (BL 20), Shenshu (BL 23), Zusanli (ST 36), Sanyinjiao (SP 6), Hegu (LI 4), Jianjing (GB21), Quchi (LI 11), Waiguan (TW5), Jiexi (St.41), Taibai (Sp.3), Taichong (Liv3), Dazhui (Du14). These points are standard points used in acupuncture for diabetes specified in the literature.¹⁶ Acupuncture was administered by trained professional from Yes 4 Health hospital.

Assessment of cognition

Spatial and verbal memory test

This is a standardized test to assess spatial and verbal memory.¹¹

Mini Mental State Examination (MMSE)

The Mini Mental State Examination (MMSE) is a tool that can be used to systematically and thoroughly assess mental status.¹²

Ethical consideration

The study was approved by Institutional Human Ethics committee (EC/22/1/2015) of the hospital.

Statistical analysis

Data was presented as mean ±SD. Data was analyzed by using SPSS 20.0. Paired t test was used to assess significance of difference between the groups.

RESULTS

Demographic parameters were not significantly different between the groups (Table 1). Pre intervention scores of spatial, verbal memory and MMSE scores were significantly impaired in diabetic patients when compared with controls (Table 2). Post intervention scores of spatial, verbal memory and MMSE were not significantly different between the groups (Table 3). Significant improvement was observed in cognitive functions in cases followed by intervention (Table 4).

Table 1: Demographic profile of cases and controls

Parameter	Cases (n=30)	Controls (n=30)
Age (years)#	40±5.77	42±6.21
Gender (Male: female)	18:12	16:14
Height (cms)#	158±16.72	155±19.37
Weight (kgs)#	71.32±22.6	69.78±18.96

#Values are expressed in Mean ± SD. There is no statistically significant difference in between the cases and controls.

Table 2: Spatial and verbal memory and MMSE scores of cases and controls before intervention

Parameter	Cases (n=30)	Controls (n=30)	P value
Spatial Memory Score	3.52±1.66	6.48±2.37	<0.0001***
Verbal Memory Score	2.58±0.33	5.35±2.47	<0.0001***
MMSE score	18.44±3.42	23.72±5.68	<0.0001***

Values are expressed in Mean ± SD. *P<0.05, **P<0.01, ***P<0.001

Table 3: Spatial and verbal memory and MMSE scores of cases and controls after intervention

Parameter	Cases (n=30)	Controls (n=30)	P value
Spatial Memory Score	5.47±2.62	6.32±2.58	0.2105
Verbal Memory Score	4.37±1.68	5.28±2.62	0.1147
MMSE score	22±6.88	24.1±5.98	0.2121

Values are expressed in Mean ± SD. *P<0.05, **P<0.01, ***P<0.001

Table 4: Spatial and verbal memory and MMSE scores of cases before and after intervention

Parameter	Before	After	P value
Spatial Memory Score	3.52±1.66	5.47±2.62	0.0011**
Verbal Memory Score	2.58±0.33	4.37±1.68	<0.0001***
MMSE score	18.44±3.42	22±6.88	0.0139*

Values are expressed in Mean ± SD. *P<0.05, **P<0.01, ***P<0.001

DISCUSSION

Due to industrialization globally, the physical activity was decreased and life style changed. All these factors increased life style disorders all over the world. Acupuncture was reported to be beneficial for diabetic patients and no complications was reported followed by acupuncture.^{13,14} In acupuncture nearly 20 points were reported to manage diabetes. Apart from lowering the blood glucose levels, acupuncture can also prevent/ delay the complications of diabetes. It was reported that acupuncture acts through multiple systems and controls diabetes and its complications. Animal studies reported that acupuncture improves cognition in rats with dementia.¹⁷ Acupuncture improves the ability of learning or relearning and memory.¹⁸ It was reported that acupuncture improves cognition through increasing the reactivity of acetylcholinesterase.¹⁹ Acupuncture effects brain cell proliferation and cell apoptosis.²⁰ Impaired

glucose metabolism in brain cause dementia and acupuncture regulates glycometabolic enzymes in the brain.²¹ However, the reports of acupuncture on cognition are variable.²² The present study supports earlier studies who reported, positive impact of acupuncture on cognition.

Limitations

The major limitation of the present study is less sample size. Also, we have not studied neuro transmitter levels.

CONCLUSION

Our study supports to advocate the acupuncture as a treatment to improve cognitive function. We recommend further detailed study in this area to provide high quality evidence to support the acupuncture in the management of diabetes and its complications.

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