

Effect of Short Term Integrated Approach of Yoga Therapy on Memory Scores in type 2 Diabetes Mellitus Patients

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ABSTRACT:

Background: Diabetes Mellitus can cause memory loss. Yoga helps in maintaining memory control. This study was designed to assess the effects of integrated approach of Yoga Therapy in improving the memory scores in diabetic patients.

Aims and Objectives: The objective was to investigate the influence of integrated approach of yoga on memory scores of diabetics using Wechsler's memory scale.

Materials and Methods: In the month of July 2011, all known diabetics aged 40 years and above, coming to SVYASA AROGYADHAMA for Yoga therapy, willing to volunteer for the study and who understood English were included in the yoga group after taking written informed consent. All diabetics (n=31) were administered with sections of WECHSLER MEMORY SCALE (WMS) on the first day and again after one week of yoga practice at Arogyadhama to assess: 1) attention and concentration (digit span forward and backward), and 2) associate learning. Data thus obtained were analyzed using paired t-test. Institutional Ethical clearance was obtained for the study.

Results: Diabetics on Yoga interventional therapy showed statistically significant improvement in memory scores ($p < 0.001$); Digit span forward scores ($p < 0.001$); Digit span backward scores ($p < 0.001$); Associate learning easy scores ($p < 0.001$); Associate learning hard scores ($p < 0.001$); Total associate learning scores ($p < 0.001$).

Conclusion: Short term Integrated yoga practices can improve memory scores of diabetics and play a vital role in managing the mental health of diabetics.

Keywords: Diabetes Mellitus, Yoga, Wechsler memory scale, memory

Access this article online	
Quick Response Code:	Website: www.innovativepublication.com
	DOI: 10.5958/2394-2126.2015.00015.8

INTRODUCTION

DIABETES MELLITUS is a complex metabolic disease that can have devastating effects on multiple organs in the body.¹ Although peripheral and autonomic neuropathy is a common complication of diabetes, one of the debilitating effects of diabetes can be memory loss. This can be a very distressing situation for diabetic patients to deal with. Memory loss due to old age is inevitable. However if relatively young diabetic patients have memory loss, then needful steps have to be taken to tackle the situation.²

Memory is the capacity to retain and recall information about past and present incidents. Memory capacity, is the ability to analyze and synthesise the assimilated information and not information storage alone.³ Cognition includes memory, psychomotor speed, visuospatial functions, frontal executive functions, processing speed, verbal fluency, attention and complex motor functions.⁴ Elevated blood glucose levels in diabetics can result

in brain malfunction and it promotes the synthesis of sorbitol, which damages blood vessels and causes degeneration of the nerves, resulting in neuropathology which can lead to dementia or cognitive impairment.¹

Yoga is a very old practice that originated in India; the term refers to union or communication.⁵ Yoga involves breathing techniques and posture and it helps to maintain cognitive control, specifically in the areas of attention, memory and arousal control.⁶ The present study was designed to assess the effects of intervention using yoga life style methods (which include yogic exercises, dietary management, moderate aerobic exercise and stress management) in the improvement of memory scores in diabetic patients.

AIMS

To investigate the influence of short term integrated approach of yoga on memory scores of diabetics using Wechsler's memory scale.

MATERIALS AND METHODS

Sample size and study period: In the month of July 2011, all known diabetics aged 40 years and above, coming to SVYASA AROGYADHAMA for Yoga therapy, willing to volunteer for the study and who understood English were included in the yoga group after taking written informed consent. 31 diabetics

were enrolled for the yoga group. Ethical clearance was obtained from Institutional Ethical committee of SVYASA before starting the protocol. Diabetics from psychiatry section of Arogyadhama, who came for rehabilitation and who were severely ill, were excluded from the study.

Program: Each diabetic underwent Integrated Approach to Yoga Therapy (IAYT) which included physical postures (Asanas), voluntary breathing (Pranayamas), meditation, internal cleansing processes (Kriyas) and lectures on practice of yoga and derived the following special techniques in diabetic section.

Breathing exercises: Hands in and out, Hands stretch, Ankle stretch, Tiger breathing. Sashankasana, Dhanurasana, Naukasana, Straight Leg raising, Pavanamuktasana, folded leg lumbar stretch, Setubandasana. And DYNAMIC EXERCISES: Jogging (forward and backward), Twisting, side bending, suryanamaskara, cycling, Deep Relaxation Technique (DRT), Chakki chalari, chapathi making, Bhujangasana, Boating. They underwent these procedures daily and each session lasted for 1 hour.

Design: 31 diabetics were administered WECHSLER MEMORY SCALE (WMS) on the first day of their admission and again after one week of yoga practice at Arogyadhama. The components tested with WECHSLER MEMORY SCALE (WMS) were: (a) digit span forward and backward (each correct answer scored as 1, the sum of all correct answers for digit span forward and backward were recorded separately), and (b) Verbal paired associate learning (easy and hard). The verbal paired associate learning task involved the presentation of ten pairs of unrelated words as three trials. After the three trials the examinee were presented with the first word in each pair and he or she were asked to provide the second word. Out of the ten pairs, six pairs were semantically easy to remember (e.g., table-chair).

Where such association exists, it was described as associate learning, easy. Where there was no such associations the task was described as associate learning, hard. There were six pairs for the easy task and four pairs for the hard task. Each correct answer was scored as '1' (for digit span forward or backward), while for associate learning, each easy answer was scored as '1' and difficult or hard answer as '2'. This was based on the conventional scoring for Wechsler memory scale.⁷

Parallel worksheets were prepared, changing the digits and words to eliminate serial testing artifacts when retesting.⁸ Data thus obtained were analyzed by paired t-test using the statistical software namely SPSS version 20.0.

RESULTS

In the present study, among 31 participants, 12 (38.7%) were males, and 19 (61.3%) were females. The mean age of the patients having diabetes type 2 was 61.51 ± 9.30 years.

Table 1: Parameters at Baseline and after one week

Parameters	Yoga Group(n= 31)		
	Baseline	After	p value
Memory(WECHSLER MEMORY SCALE score	18.22± 5.79	21.98± 6.50	0.001
Digit span forward scores	5.80± 1.75	6.45± 2.07	0.001
Digit span backward scores	3.29± 1.67	4.25± 1.91	0.001
Associate learning easy scores	14.38± 2.61	15.70± 2.41	0.008
Associate learning hard scores	3.87± 5.26	6.83± 5.74	0.001
Total associate learning scores	9.12± 3.58	11.27± 3.45	0.001

The memory status of yoga group significantly improved after yoga intervention with mean \pm SD (21.98 ± 6.50) as compared to before yoga intervention (18.22 ± 5.79) with p value < 0.001.(Fig:1)

A significant improvement was seen in Digit span forward scores (p<0.001); Digit span backward scores(p<0.001); Associate learning easy scores (p<0.001); Associate learning hard scores (p<0.001); Total associate learning scores (p<0.001).

DISCUSSION

Previous studies have proved beyond doubt that cognitive decline seems to increase with increase in duration of diabetes. Aging does have a role in cognitive decline but, middle-aged patients with type 2 diabetes show accelerated cognitive decline when compared to non-diabetic middle-aged patients.⁹

Yoga is mind-body technique that involves relaxation, meditation and a set of physical exercises performed simultaneously with breathing. It is the best method of achieving physical, mental, social, and spiritual well-being.¹⁰

Yoga assists in improving the memory power with yogic techniques of concentration and meditation. The brain function of attention, cognition, processing of sensory information and visual perception are toned with yogic practices. Yogic practices help to calm the mind and enhance concentration skills by increasing the circulation of blood to the brain through its asanas, pranayamas, meditation and om chanting. Memory lapses can also be prevented, through yogic practices that enhance the power of recall.³

The memory status of yoga group diabetics significantly improved after yoga intervention. The digit span tests assess attention, concentration and primary working memory.¹¹ Verbal paired associate learning assesses integration of information and episodic memory.¹² The present results suggest an improvement in these aspects of memory after yoga intervention in the yoga group.

Yogasana is based on a sound knowledge of human anatomy and physiology. Placing the body in certain posture or position stimulates specific nerves, organs and glands. Sitting yogasanas provide greater blood circulation in parts above the waist. Thus, the vital organs are energized, giving increased stimulus to brain functioning. Similarly, inverted yogasanas help in increasing blood flow to the brain and activate the brain cell, thereby improving memory and attention.¹³

Many researchers and Yogis have reported the benefits of practising pranayama on Diabetes Mellitus.¹⁴ This systematic breathing pattern results in improvement in Feeling Healthy, enhancing Memory Recall, decreasing Mental Stress and imparting Physical Relaxation.¹⁵

Regular practices of yoga is associated with the reduction of basal cortisol and catecholamine secretion, a decrease in sympathetic activity with the corresponding increase in parasympathetic activity, reduction in metabolic rate and oxygen consumption with beneficial effect on cognitive functions and cerebral neurophysiology.¹⁶

However, one study limitation is the lack of a control group in this investigation. A follow-up control-group design study by a group of interested investigators would be welcome. Thus from this study we found that yoga life style intervention has several beneficial effects, in the form of improvement of memory status. The present study also shows that adjunctive use of yoga life style interventions significantly improves memory status of diabetics. Being a traditional and cost effective lifestyle management maneuver it can be used as an alternative therapy in diabetics.

CONCLUSION

The present study suggests that a short term integrated yoga therapy can improve the memory scores of diabetics. To conclude, yoga could be prescribed as a supplement to conventional therapy of treatment for diabetes.

ACKNOWLEDGEMENT

I would like to thank and acknowledge the immense support of SVYASA University and Department of Physiology of Sri Devaraj Urs Medical College, for the assistance in undertaking the study.

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