



IMMEDIATE EFFECT OF MIND SOUND RESONANCE TECHNIQUE (MSRT- A YOGIC RELAXATION TECHNIQUE) ON COGNITIVE FUNCTIONS IN TYPE 2 DIABETES

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Abstract

Diabetes is one of the chronic medical conditions with high prevalence rates. Long standing diabetes is associated with impaired cognitive functioning. Yoga is known to improve the cognitive functions in normal and many health conditions. Mind Sound Resonance Technique (MSRT) is one of the mindfulness based yogic relaxation technique, known to enhance cognitive functions. The objective comprised to study the immediate effect of MSRT practice on cognitive functions in patient with type 2 diabetes. Forty three (18 male) type 2 diabetes patients with an age range between 30 to 65 (mean age \pm SD = 56.83 \pm 12.54) with minimum history of diabetes since last 5 years, were enrolled in this study. All the subjects underwent training of 15 sessions of MSRT practice in 6 days. DLST test was used to assess psychomotor speed, which involves visual scanning, mental flexibility, sustained attention, psychomotor speed and speed of information processing. On 7th day subjects were administered DLST before and immediately after the 30 minutes of MSRT intervention. Data was found normally distributed by Shapiro-Wilcox test. The paired sample t test was used to see the pre-post changes. There was significant improvement in total score ($p = 0.001$; +24.99%) and net score ($p = 0.001$; +25.47%) along with a nonsignificant decrease in wrong attempts ($p = 0.855$) of DLST. Present pilot study indicates that MSRT may have a potential role in enhancing psychomotor performance in patients suffering from diabetes, immediately after the practice. These findings need confirmation from studies with a larger sample size and randomized controlled design, which will be implicated in the future.

Keywords: Mind sound resonance technique; psychomotor performance; diabetes, mindfulness, cognitive function.

Diabetes is a metabolic disorder characterized by chronic elevated blood sugar levels. In the long run it leads to multi-organ dysfunction like, heart, brain, kidneys, eyes, blood vessels, etc¹. Many studies have demonstrated that diabetes poor cognitive functioning in terms of reduced, memory concentration, processing speed etc². Diabetic patients are. Yoga is one of the ancient sciences. It was discovered and practiced by ancient Indian sages for the higher purposes of life like, self realization and achievement of super-natural powers called siddhi's. Recent scientific studies on yoga revealed its healing secret in various health conditions such as diabetes³, hypertension⁴, cardiovascular disease⁵, parkinson's disease⁶ etc. Yoga is also known to have a positive influence on psychological conditions like anxiety⁷, depression⁸, schizophrenia⁹ etc.

MSRT: Mind sound resonance technique is one of the mindfulness based relaxation techniques, in which resonance is generated by chanting the mantras. It leads to deep relaxation of the mind and body. Practice of MSRT enhances the relaxation, wellbeing, will power etc¹⁰. It is known to reduce state anxiety, pain, tenderness and disability in patient with chronic low back pain¹¹. In another study MSRT reduced state anxiety and improved cognitive performance immediately after the practice in patient suffering from generalized anxiety disorder.¹² This study was aimed to see the immediate effect of MSRT on cognitive functions in patients of type 2 diabetes.

Method: Fortythree subjects (18 male) with an age range between 30 to 65 (mean \pm SD = 56.83 \pm 12.54), suffering from diabetes type 2, since last minimum 5 years, were enrolled in this study [see table 1].

Table 1: Demographic detail of the patients

Sr no	Gender	Number	Age (years)
1	Male	18	56.76
2	Female	25	57.00
3	Total	43	56.83

All the subjects were on anti-diabetic medication. Subjects had no previous exposure to MSRT practice and were given one week of orientation to MSRT practice before the study. On 7th day subjects were administered DLST before and immediately after the MSRT intervention.

Measures: The digit letter substitution task (DLST): This test was developed from the Digit Symbol Substitution Test (DSST) as one of the subsets of the Wechsler intelligence scale. Substitution tests are essentially speed-dependent tasks that require the subject to match particular signs and symbols, digits or letters to other signs within a specified time period (90 s).¹³ Substitution tasks involve visual scanning, mental flexibility, sustained attention, psychomotor speed and speed of information processing. DLST is a valid tool for assessing neuro-psychiatric illnesses and has been standardized for the Indian population¹⁴. **Assessment:** All assessments were performed on an empty stomach between 6:30 pm and 7:00 pm. MSRT session was given in the supine position for 30 min in a dark, quiet room. A pre-recorded audio-tape was used to give the MSRT instructions.

Intervention: MSRT is one of the advanced yoga-based mindful relaxation techniques that involves experiencing with closed eyes the internal vibrations and resonance developed while counting the syllables A, U, M, Om and Mahamrityunjayamantra sounds. The details of MSRT practice, including the steps involved are described elsewhere.

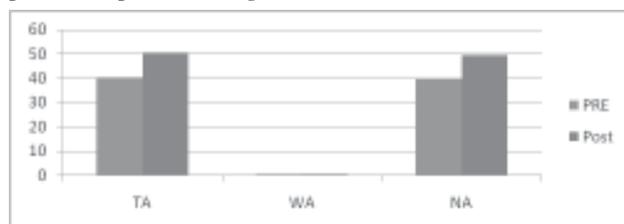
Data analysis: All statistical analysis was performed using the Statistical Package for Social Sciences (SPSS version 10.0). data was found normally distributed by the Shapiro-Wilcox test. The Paired sample t test was applied to find the pre-post changes.

Result: There was significant improvement in total score ($p = 0.001$; +24.99%) and net score ($p = 0.001$; +25.47%) of DLST [see table 2].

Table 2: Details of Pre and Post test Scores

Sr No	PreMean SD	±	PostMean SD	±	% change	P*- Value
TA	40.41 ± 15.27		50.51 ± 15.57		+ 24.99	<0.001**
WA	0.60 ± 1.8		0.67 ± 1.8		+ 11.67	0.88
NA	39.53 ± 15.66		49.60 ± 15.90		+ 25.47	<0.001**

TA=Total attempt, NA=Net attempt, WA=Wrong attempt, ^apaired sample t test, ** significance level at 0.001



Graph 1: Graph showing changes mean score of DLST, before and immediately after the practice of MSRT

Discussion: This study was aimed to see the immediate effect of MSRT on cognitive functions in patients with type 2 diabetes, at the end of the study, we observed the significant improvement in total and net score of DLST. In one of the recent study on immediate effect of MSRT on state anxiety and psychomotor performance in patient with generalized anxiety disorder has shown to enhance psychomotor performance as compared to supine rest¹⁵. In another randomized controlled study, MSRT intervention, given daily for 10 days, was found useful in reducing the state anxiety in patients suffering from chronic neck pain.. In this study¹⁶.

The results of this study are also in support of findings of previous studies. Possible mechanism behind these findings, after the practice of MSRT may be because, Yoga known to improve autonomic functions via triggering neurohormonal mechanisms that suppress sympathetic activity through down-regulation of the hypothalamic-pituitary-adrenal axis¹⁷ and mindfulness-based practices are predicted to enhance cognitive flexibility¹⁸. The strengths of the study are: (a) This multidisciplinary study encompasses the fields of yogic science, psychology and diabetology; (b) due to the short duration of yoga intervention, acceptability and adherence to therapy was good; and (c) as MSRT was delivered through a standard protocol, it could be reproduced in the exact way for all cases. Small sample size and lack of control group are the most important limitations of the study. This study was a pilot project to assess the response to MSRT in a small patient population to plan for a better study with a much higher sample size and better design in the future. There is a lack of objective variables to understand the mechanism of action of MSRT at the electro-physiological, neurological and biochemical levels. Future studies should include randomized controlled design with a larger sample size along with objective variables of autonomic functions such as heart rate variability nerve conduction velocity, biomarkers such as blood sugar level.

Conclusion: The Present pilot study indicates that MSRT may have a potential role in enhancing cognitive functionings in patients suffering from type 2 diabetes, immediately after the practice. These findings need confirmation from studies with a larger sample size and randomized controlled design, which will be implicated in the future.

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