



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

International Journal of Current Research  
Vol. 11, Issue, 12, pp.8752-8755, December, 2019

DOI: <https://doi.org/10.24941/ijcr.37452.12.2019>

INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH

## RESEARCH ARTICLE

### EFFECT OF RAJYOGA MEDITATION ON LIPID PROFILE IN TYPE -2 DIABETIC PATIENTS

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#### ARTICLE INFO

##### Article History:

Received 24<sup>th</sup> September, 2019

Received in revised form

18<sup>th</sup> October, 2019

Accepted 07<sup>th</sup> November, 2019

Published online 30<sup>th</sup> December, 2019

##### Key Words:

Type-2 Diabetic Patients,  
Lipid Profile and Rajyoga Meditation.

#### ABSTRACT

**Introduction**-Diabetes Mellitus is a metabolic disorder of multiple aetiologies characterized by chronic hyperglycemia resulting from defective insulin secretion, insulin function or both. **Material & Method:** This was an intervention, pre and post study. All diabetic patients in the age group of 30-60 years, including both sexes and taking treatment since 5 to 10 years. **Discussion:** In our study a total of 17 diabetic patients in the age group of 32-60 years were studied. Comparison of fasting blood sugar pre and post intervention yielded significant finding. However, comparison of findings of HBA1C, TC, TG, HDL, LDL AND VLDL pre and post intervention was not significant. **Conclusion:** Rajyoga as a complementary intervention is effective in improving glycaemic control.

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**Citation:** Dr. Dalia Biswas, Dr. Komal Meshram and Dr. Satish Pawar. 2019. "Effect of Rajyoga meditation on Lipid profile in type -2 Diabetic patients.", *International Journal of Current Research*, 11, (12), 8752-8755.

## INTRODUCTION

Diabetes Mellitus is a metabolic disorder of multiple aetiologies characterized by chronic hyperglycemia resulting from defective insulin secretion, insulin function or both. A number of large-scale RCTs (i.e., Da Qing DPS, MALMO Feasibility Study, Finnish DPS, United States DPP, Indian DPP, SLIM, and Japanese DPS trials) have been performed in persons who are at risk for T2DM (overweight/obese, IGT and/or IFG) in order to evaluate lifestyle modification of diet and physical activity (Pan, 1997; Tuomilehto, 2001; Kosaka, 2005; Eriksson, 1991). Findings indicated that the combined lifestyle intervention of dietary and physical activity relative to the education control or usual/standard- care condition produced greater risk reduction for progressing to T2DM. Meta-analysis indicated that over all of these studies, the risk of becoming T2DM was reduced by about 51% (range: 42%-67% reduction) by the combination intervention (Thomas, 2010). The characteristic features of diabetic dyslipidemia are a high plasma triglyceride concentration, low high-density

lipoprotein (HDL) concentration and increased concentration of small dense low-density lipoprotein (LDL) particles. Insulin resistance leads to increased flux of free fatty acids and hence the lipid changes (Mooradian Arshag, 2009). Reports from the National Health and Nutrition Examination Survey (NHANES) 1999–2000 indicate that 51% of adults aged 20–59 years with diabetes have hypercholesterolemia (Ford 2003; Imperatore, 2000). Raja yoga meditation is a behavioral intervention which is practiced in India and all over the world. It appears to (Easy Raj Yoga, 1981). Some studies done on Raja-yoga meditators have shown increased parasympathetic activity in meditators and improvement in the lipid profile of meditators than non-meditators (Telles, 1993; Vyas, 2002; Vyas, 2002). Our hypothesis is that these three lifestyle interventions namely Rajyoga meditation, can have a role to play in slowing down the progress of diabetes in T2DM.

#### Objectives of the study was

- To find out the out the fasting blood sugar (FBS) and post prandial blood sugar (PPBS) in the study group.
- To compare the HbA<sub>1</sub>C among the study group.
- To analyze the lipid profile values in all the study group

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## MATERIALS AND METHODS

The guidelines of the National Diabetes Data Group and the third set of the Adult Treatment Panel of the National Cholesterol Education Program (NCEP ATP III) shall be used to recruit patients with type 2 diabetes and dyslipidemia (14,15). Diabetic patients who are smokers, alcoholics, pregnant, on long-term steroids and those with known retinopathy, nephropathy, coronary artery disease and cerebrovascular diseases shall be excluded from the study.

**Study Design-** This was a intervention, pre and post study.

**Study setting-** Department of Physiology, Jawaharlal Nehru Medical College, Wardha.

**Period of Study** – 1 ½ years.

**Study participants** – All diabetic patients in the age group of 30-60 years, including both sexes and taking treatment since 5 to 10 years.

### Sample size-20

**Intervention:** By random selection 20 diabetic patients were allocated to the intervention group. (Rajyoga meditation (RM)). In the study group, the person shall sit upright and concentrate on a point of white light. There are 3 stages

- **Initiation:** in this stage, thoughts in the mind, come in randomly.
- **Concentration:** He now, converts all negative thoughts with positive thoughts of peace, happiness, love bliss purity .knowledge & power.
- **Realization:** This final stage involves feeling the emotions of these positive thoughts. RM was practised daily for 10 min in the morning and 10 min in evening. The participants were reviewed in the mind-body – medicine clinic every weekend for the first 3 months and after every fortnight for the last 3 months.

### Observation

### Sample size-20

**Outcome measures:** Primary follow up measure were fasting and postmeal blood sugar and lipid profile estimations. The secondary follow up measure was HbA<sub>1c</sub>. HbA<sub>1c</sub> were estimated using morning blood samples by immunoturbidity method. The fasting blood samples were analyzed for triglycerides (TG), total cholesterol (TC) and high-density lipoprotein-cholesterol (HDL-C). Total cholesterol shall be estimated by Enzyme end point method. HDL cholesterol shall be assessed by enzyme direct method. Triglyceride by GPO-PAP method. LDL cholesterol and VLDL shall not separately estimated but calculated. LDL shall be calculated using the formula: LDL cholesterol = Total cholesterol – [HDL cholesterol + TG/5). The lipid profile study shall also be done with lipid profile Kit as per suitability.

## DISCUSSION

In our study a total of 17 diabetic patients in the age group of 32-60 years were studied. Comparison of fasting blood sugar pre and post intervention yielded significant finding. However, comparison of findings of HBA1C, TC, TG, HDL, LDL AND VLDL pre and post intervention was not significant. Some studies have reported the benefits of yoga as a stand-alone intervention for the management of diabetes and reported improvement in glycaemic control (Bhardwaj, 2015). Raja yoga meditation is a superior form of meditation in which flow of thoughts is encouraged by using the mind in a natural way to relieve stress. Yoga practices can influence outcomes in those with and at risk for type 2 diabetes (DM2) (Effect of raja yoga meditation on glycaemic status in type 2 diabetes mellitus). Yoga may lessen the negative impact of stress and promote multiple positive downstream effects on metabolic function, neuroendocrine status, and related inflammatory responses and, ultimately, reduce risk for CVD and other vascular complications, by enhancing well-being and reducing reactivity and activation of the HPA axis and the sympathoadrenal system (Vaishali, 2012).

**Table 1. Age wise distribution of patients in study group**

Age Group(yrs)	Group A	χ <sup>2</sup> -value
31-40 yrs	4(23.53%)	8.66
41-50 yrs	2(11.76%)	p=0.07,NS
51-60 yrs	11(64.71%)	
Total	17(100%)	
Mean±SD	52±10.39	
Range	32-60 yrs	

**Table 2. Gender wise distribution of patients in three groups**

Gender	Group A	χ <sup>2</sup> -value
Male	13(76.47%)	1.23
Female	4(23.53%)	p=0.53,NS
Total	17(100%)	

**Table 3. Fasting blood sugar level in study group pre and post operatively Student's paired t test**

		Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-value
Study Group	Pre t/t	135.00	17	51.73	12.54	34.82±50.53	2.84
	Post t/t	169.82	17	86.75	21.04		

**Table 4. Comparison of HbA1C level in study group pre and post operatively Student's paired t test**

		Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-value
Group A	Pre t/t	8.99	17	1.77	0.42	0.24±1.64	0.62
	Post t/t	9.24	17	2.09	0.50		p=0.54,NS

**Table 5. Comparison of TC level in study group pre and post operatively Student's paired t test**

		Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-value
Group A	Pre t/t	173.00	17	40.26	9.76	5.58±37.18	0.62
	Post t/t	178.58	17	54.24	13.15		p=0.54,NS

**Table 6. Comparison of TG level in study group pre and post operatively Student's paired t test**

		Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-value
Group A	Pre t/t	152.94	17	103.62	25.13	5.94±64.03	0.38
	Post t/t	147.00	17	86.00	20.86		p=0.70,NS

**Table 7. Comparison of HDL level in study group pre and post operatively Student's paired t test**

		Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-value
Group A	Pre t/t	33.00	17	6.15	1.49	1.29±5.82	0.91
	Post t/t	31.70	17	6.79	1.64		p=0.37,NS

**Table 8. Comparison of LDL level in study group pre and post operatively Student's paired t test**

		Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-value
Group A	Pre t/t	108.76	17	30.08	7.29	1.70±26.01	0.27
	Post t/t	110.47	17	35.45	8.59		p=0.79,NS

**Table 9. Comparison of VLDL level in study group pre and post operatively Student's paired t test**

		Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-value
Group A	Pre t/t	31.82	17	20.25	4.91	0.05±11.83	0.02 p=0.98,NS
	Post t/t	31.76	17	18.47	4.47		

Even short term yoga training programs can reduce perceived stress, improve mood, and lower catecholamine and cortisol levels, cardiovascular response to stress, blood pressure, and other indices of sympathetic activation in both healthy and adults with diabetes (Vaishali, 2012; Chu, 2014). Yogic practices help to shift the autonomic nervous system balance from sympathetic to parasympathetic, by directly enhancing parasympathetic output, possibly via vagal stimulation, resulting in positive changes in cardiovagal function and associated neuroendocrine, hemodynamic, and inflammatory profiles, in sleep and affect, and in related downstream metabolic parameters (Vaishali et al., 2012; Chu, 2014).

Yoga promotes these favourable changes by selectively activating specific brain structures and neurochemical systems related to attention and positive affect, as suggested by recent neurophysiological and neuroimaging research findings (Chu et al., 2014). Yoga may also increase resilience to stress, a factor that has been linked to improved outcomes in DM2 (Chu et al., 2014; Carnethon, 2006). These changes help to buffer the deleterious effects of stress, improve glucose control, enhance mood, sleep, and autonomic function, reduce blood pressure, and promote improvements in other related risk factors of relevance to DM2 management (Chu et al., 2014; Maser, 2003).

Ronald M. Krauss found in his study that Each of the lipid abnormalities (low HDL, small dense LDL, and elevated triglycerides) is associated with an increased risk of coronary artery disease.

## Conclusion

Rajyoga as a complementary intervention is effective in improving glycaemic control. However large scale studies are required to prove its efficacy in lipid control in type 2 diabetic patients.

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