

## Study on Effect of Yoga and Meditation in Reduction of Stress in Diabetic and Hypertensive Patients

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### Abstract:

Stress is a response to a physical threat or psychological distress that generates a host of chemical and hormonal reactions in the body. As a part of the adaptive response to stress, various body systems such as the autonomic, cardiovascular, gastrointestinal, and immune systems may be affected. Yoga and meditation help therapeutically and promotes physical and mental health. Study group of patients & individuals were enrolled from both MGM hospital and International Sahaja Yoga Meditation and Research Centre. So it may be concluded that Sahaja yoga meditation if included as part of regular treatment regimen along with routine medication it can lead improvement in quality of life by reducing stress and thus prevent complications of Diabetes mellitus & Hypertension.

**Keywords:** T2DM -Type 2 Diabetes Mellitus, LDL - Low Density Lipoprotein, HDL-High Density Lipoprotein, TG- Triglyceride, HbA1c - Glycated Hemoglobin, Sahaja Yoga.

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### Introduction

Stress is a response to a physical threat or psychological distress that generates a host of chemical and hormonal reactions in the body. As a part of the adaptive response to stress, various body systems such as the autonomic, cardiovascular, gastrointestinal, and immune systems may be affected.

Diabetes mellitus is becoming increasingly prevalent and magnifies the risk of cardiovascular complications and shares several risk factors in common with CAD. Hypertension is a major contributor to the cardiovascular morbidity and mortality in industrialized countries and is rapidly increasing in developing countries like India.

Yoga and meditation help therapeutically and promotes physical and mental health. Because of the increasing burden of the lifestyle diseases and potential to prevent them, efforts are required for promotion of stress relaxation programs and diabetes screening programs.

Increasing awareness of risk factors and how to prevent these should be emphasized in the population. It is believed that regular practice of yoga and meditation brings about a decrease in

stress levels and improved antioxidant status. Sahaja Yoga a unique method of meditation is the state of self-realization produced by kundalini awakening and is accompanied by the experience of thoughtless awareness or mental silence.

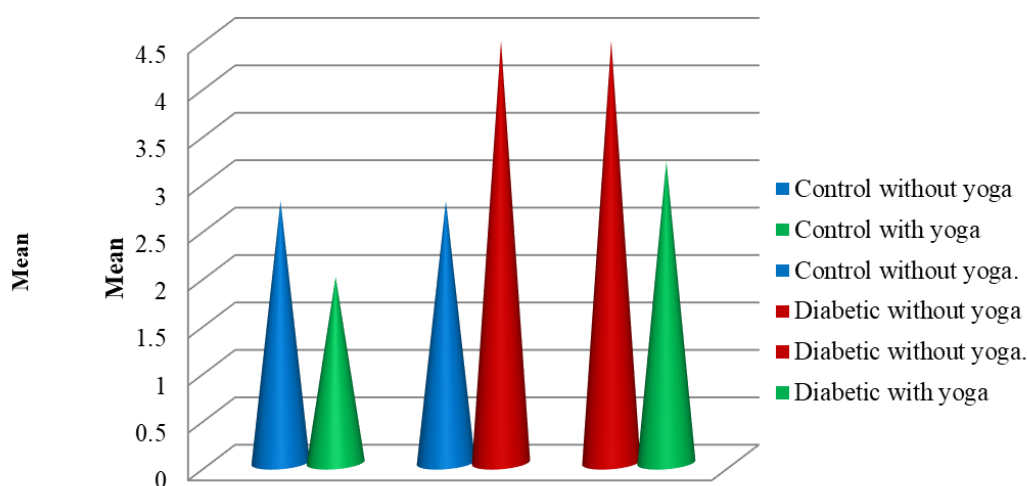
### Materials & Methods

The aim of this study was to assess the effect of yoga and meditation in reduction of stress in patients with Diabetes mellitus and Hypertension. Study group of patients & individuals were enrolled from both MGM hospital and International Sahaja Yoga Meditation and Research Centre. Informed consent was taken from all the patients. All questionnaires and Investigations which are mentioned were done at MGM Medical College. The Biochemical parameters such as, fasting blood sugar (FBS), HbA1c, cortisol was determined. The MDA (malondialdehyde), SOD (superoxide dismutase), and Nitric oxide activities were measured for antioxidant status. All parameters were performed in the Department of Biochemistry, MGM Medical College.

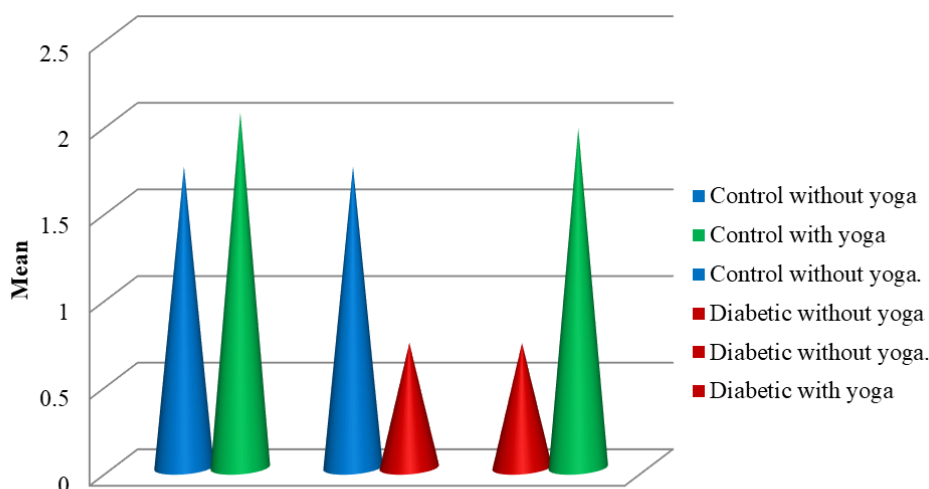
### Results and Discussion:

**Table 1: Comparison of Diabetic hypertensive patients (with & without yoga)**

Parameter	Group	Mean	SD	t-stat	p-value
Glucose (mg/dl)	Diabetic without yoga	183.13	61.53	3.42	0.0001***
	Diabetic with yoga	123.13	28.44		
HbA1c (%)	Diabetic without yoga	7.7	1.88	2.69	0.011*
	Diabetic with yoga	6.16	1.17		
Cortisol (nmol/L)	Diabetic without yoga	406.51	75.95	3.11	0.004**
	Diabetic with yoga	332.96	50.72		
MDA ( nmol/ml)	Diabetic without yoga	4.45	0.69	5.31	0.0001***
	Diabetic with yoga	3.17	0.622		
SOD (Unit/ml)	Diabetic without yoga	0.723	0.66	-5.738	0.10001***
	Diabetic with yoga	1.962	(1513)		
NO (um01/L)	Diabetic without yoga	32.5	21.022	-6.262	0.0001***
	Diabetic with yoga	86.66	26.077		
SBP(mmHg)	Diabetic without yoga	137.6	10.11	4.35	0.0001***
	Diabetic with yoga	122.9	8.2		
DBP(mmHg)	Diabetic without yoga	90.9	7.7	2.84	0.008**
	Diabetic with yoga	84.26	4.77		



**Fig-1 Chart shows comparison of MDA mean in different groups**



**Fig-2 Chart shows comparison of SOD mean in different groups**

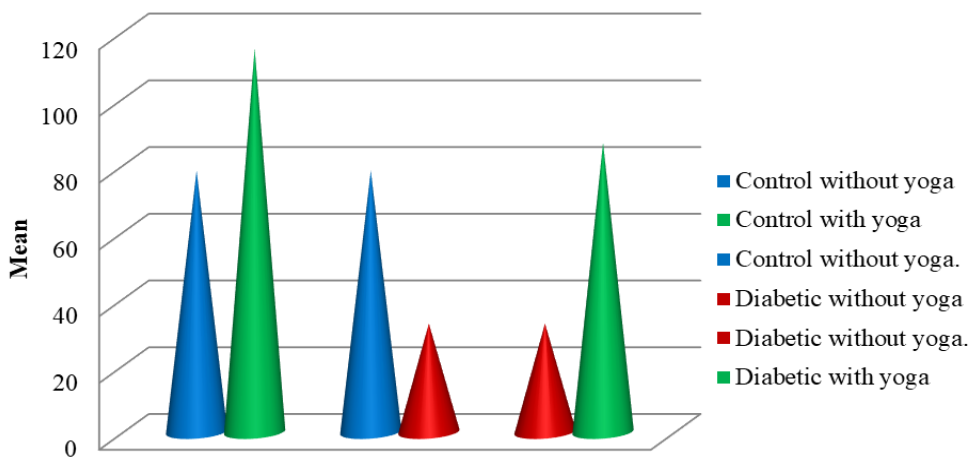


Fig-3 Chart shows comparison of NO mean in different groupes

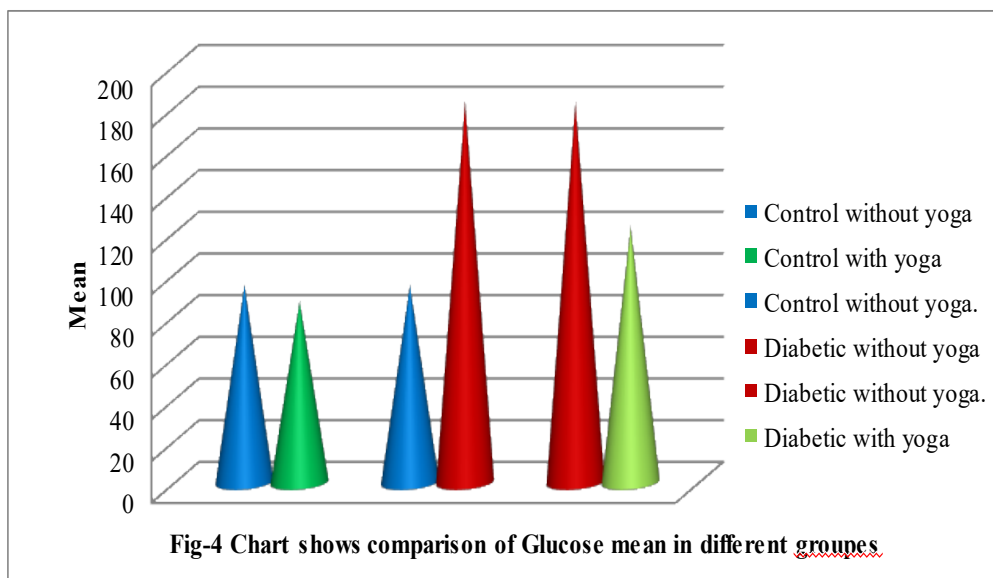


Fig-4 Chart shows comparison of Glucose mean in different groupes

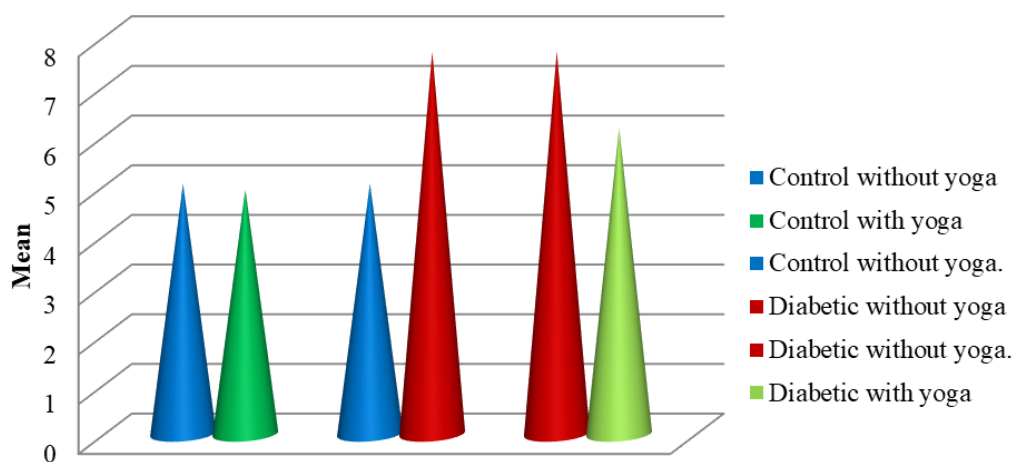
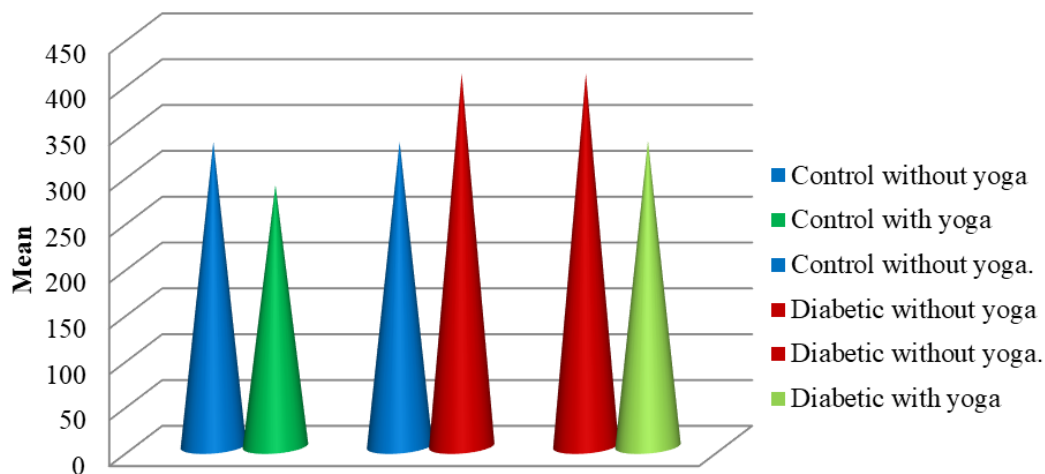


Fig-5 Chart shows comparison of HbA1c mean in different groupes



**Fig-6 Chart shows comparison of Cortisol mean in different groups**

In this study it was observed that: MDA level is decreased significantly and levels of SOD and NO were increased significantly in diabetic and diabetic hypertensive individuals after Sahaja yoga meditation. A significant level of decrease in FBG & HbA1C was obtained in diabetic and diabetic hypertensive individuals after Sahaja yoga meditation. We also observed that cortisol level, a stress marker was found to be decreased significantly in subjects after Sahaja yoga meditation. The study was undertaken to determine serum levels of antioxidants like superoxide dismutase (SOD) activities in diabetic and diabetic hypertensive patients, who were undergoing Sahaja yoga meditation; we found that there was significant improvement in these patients as compared to the diabetic and diabetic hypertensive patients, who were not undergoing Sahaja yoga meditation. The levels of these antioxidants gradually increased after Sahaja yoga meditation in healthy, Diabetic & Diabetic hypertensive subjects.

The level of MDA, a marker of lipid peroxidation was decreased in healthy as well as in diabetic and diabetic hypertensive individuals after Sahaja yoga meditation. There is also reduction in Fasting Blood Glucose & HbA1C in control, Diabetic & Diabetic hypertensive patients after Sahaja yoga meditation.

Also, there is improvement in stress marker like Cortisol in control subjects, Diabetic & Diabetic hypertensive patients, so it may be said that, Sahaja yoga meditation if included as part of regular treatment regimen along with routine medication it can lead improvement of quality of life by reducing stress and thus prevent complications of Diabetes mellitus & Hypertension.

### Conclusion

So it may be concluded that Sahaja yoga meditation if included as part of regular treatment regimen along with routine medication it can lead improvement in quality of life by reducing stress and thus prevent complications of Diabetes mellitus & Hypertension.

### References

1. West KM: Epidemiology of Diabetes and Its Vascular Lesions elsevier, New York, 1978: 19-39
2. Ad Hoc Committee on Diagnostic Criteria for Diabetes Mellitus, Clinical and Scientific Section, Canadian Diabetes Association: Acceptance of new criteria for diagnosis of diabetes mellitus and related conditions by the Canadian Diabetes Association. Can Med Assoc J 1982; 126: 473-476
3. National Diabetes Data Group: Classification and diagnosis of diabetes mellitus and other categories of glucose intolerance. Diabetes 1979; 28: 1039-1057
4. Melander A, Lebovitz HE, Faber OK: Sulfonylureas: Why, which and how? Diabetes Care 1990; 13 (suppl 3): 18-255.
5. Waldhausl WK: The physiological basis of insulin treatment - clinical aspects. Diabetologia 1986; 29: 837-849
6. Dupre J, Ehrlich RM, Hunt J et al: Guidelines for the medical management of diabetes mellitus. In A Special Report on Diabetes Mellitus, Can Diabetes Assoc, Toronto, 1982: 1-4
7. Gerich JE: Oral hypoglycemic agents. N Engl J Med 1989; 321: 1231-1245
8. Management of type II diabetes mellitus. In Rifkin H (ed): Physician's Guide to Non-Insulin-Dependent (Type II) Diabetes, 2nd ed, Am Diabetes Assoc, Alexandria, Va, 1988: 21-53

9. Hamet P, Kalant N, Ross SA et al: Recommendations from the Canadian Hypertension Society Consensus Conference on Hypertension and Diabetes. *Can Med Assoc J* 1988; 139:1059-1062
10. Canadian Consensus Conference on Cholesterol: Final report. Canadian Consensus Conference on the Prevention of Heart and Vascular Disease by Altering Serum Cholesterol and Lipoprotein Risk Factors. *Can Med Assoc J* 1988; 139 (11, suppl): 1-8
11. Guidelines for the nutritional management of diabetes mellitus in the 1990's. A position statement by the Canadian Diabetes Association. *Beta Release* 1983; 13: 8-16
12. Guidelines for the Nutritional Management of Diabetes Mellitus *Can Diabetes Assoc*, Toronto, 1984: 1-9.
13. American Diabetes Association (2010) Position Statement; Standards of Medical Care in Diabetes - 2010. *Diabetes Care*; 33(Suppl-1): S11-61..
14. Boyle P.J. (2007) Diabetes mellitus and macrovascular disease: mechanisms and mediators. *Am J Med* 120: S12-S17, 2007.
15. Bower J.K, Appel L.J, Matsushita K., Young J.H., Alonso A., Brancati L.F., Selvin E. (2012) Glycated Hemoglobin and Risk of Hypertension in the Atherosclerosis Risk in Communities Study. *Diabetes Care*, Volume 35.
16. Drexel H., Aczel S., Marte T., Benzer W., Langer P., Moll W. and Saely C.H. (2005) Is atherosclerosis in diabetes and impaired fasting glucose driven by elevated LDL cholesterol or by decreased HDL cholesterol? *Diabetes Care* 28, 101–107.
17. Dilley J, Ganesan A., Deepa R., Deepa M., Sharada G. and Williams O.D. (2007) Association of A1c with cardiovascular disease and metabolic syndrome in Asian Indians with normal glucose tolerance. *Diabetes Care*; 30: 1527-32.
18. Fauci S.A. (2008). *Harrison's Principles of Internal Medicine*. 17th Edition. United States of America. The McGraw Hill Company.
19. Graham I., Atar D. and Borch-Johnsen K. (2007) European guidelines on cardiovascular disease prevention in clinical practice: executive summary. *Eur. Heart J.* 28, 2375–2414.
20. Gerstein H.C., Swedberg K., Carlsson J., Memmery J.J.V., Michelson E.L. and Olofsson B. (2008) The haemoglobin A1c level as a progressive risk factor for cardiovascular death, hospitalization for heart failure, or death in patients with chronic heart failure. *Arch Intern Med*; 168: 1699-704.
21. International Expert Committee report on the role of the A1C assay in the diagnosis of diabetes. (2009) *Diabetes Care*, 32: 1327- 1334
- Iribarren C., Karter A.J., Go A.S., Ferrara A., Jennifer Y. and Sidney S. (2001) Glycemic Control and Heart Failure among adult patients with diabetes. *Circulation*; 103: 2668-73.
22. International Diabetes Federation. (2014) *Global Diabetes Scorecard Tracking Progress for Action*
23. Krauss R.M. and Siri P.W. (2004) Dyslipidemia in type 2 diabetes. *Med Clin North Am* 88: 897–909
24. Kontush A. and Chapman M.J. (2006) functionally defective high-density lipoprotein: a new therapeutic target at the crossroads of dyslipidaemia, inflammation, and atherosclerosis. *Pharmacol. Rev.* 58, 342–374.
25. Knopp R.H., d'Emden M., Smilde J.G. and Pocock S.J. (2006) Efficacy and safety of atorvastatin in the prevention of cardiovascular end points in subjects with Type 2 diabetes: the Atorvastatin Study for Prevention of Coronary Heart Disease End points in Non-Insulin-Dependent Diabetes Mellitus (ASPEN). *Diabetes Care* 29(7), 1478–1485.
26. Masram S.W., Bimanpalli M.V. and Ghangle S. (2012) Study of Lipid Profile and Glycated Hemoglobin in Diabetes Mellitus. *Indian Medical Gazette*
27. Mooradian A.J. (2008) Dyslipidemia in type 2 diabetes mellitus. *Nature Clinical Practice Endocrinology & Metabolism* March 2009 Vol 5 No 3. [www.nature.com/clinicalpractice](http://www.nature.com/clinicalpractice) doi:10.1038/ncpendmet1066
28. Menon V., Greene T., Pereira A. A., Wang X., Beck G. J. and Kusek J. W. (2005) Glycated haemoglobin and mortality in patients with non-diabetic kidney disease. *J Am Soc Nephrol*; 16: 3412-8.
29. Myint P.K., Sinha S., Wareham N.J., Bingham S., Luben R.N. and Welch A.A. (2007) Glycated haemoglobin and risk of stroke in people without known diabetes in European prospective investigation into cancer (EPIC) - Norfolk prospective population study, A threshold relationship? *Stroke*; 38: 271-5.
30. Nii D, Tagoe A, Amo-kodieh P. Type 2 diabetes mellitus influences lipid profile of diabetic patients. 2013; 4(6):88-92.