

Correlation between Yoga with Age, BMI in Diabetic Subjects

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ABSTRACT

Introduction: Diabetes is a serious health condition that affects in all age groups and causes a big part of morbidity and mortality. People are greater risk of diabetes due to improper dietary practice, unhealthy life style, lack of physical exercise. The present study was conducted to assess the health status through BMI in diabetic patients aged between 30- 50 years (All subjects had Type-2 diabetes) and correlate between yoga with age, BMI in diabetic subjects.

Material and Methods: Multistage stratified sampling technique was used for selecting 50 samples and an interviewed scheduled was evolved to collect information regarding socio-economic profile, dietary pattern, Yoga etc. Statistical analysis was performed to find out the effect of all factors on diabetes with the Cross tabulation was used to perform statistical calculation using SPSS.

Result: As per result obtained Positive and insignificant correlations were observed between BMI with fasting blood sugar level, before, after yoga and changes in the present study ($p>0.05$). Negative and significant correlation was observed between age with changes in fasting blood sugar level among the respondents.

Conclusion: from the above observations, it can be concluded that regular exercise (Yoga) may prevent new-onset of Type 2-diabetes, especially in patients with high BMI and high glucose level.

Keywords: Body Mass Index, Diabetes Mellitus, Fasting Glucose.

INTRODUCTION

Type 2 diabetes (DM2) has become a leading public health issue globally, with estimated 366 million people affected in 2011.¹ Observational studies addressing physical activity, weight loss, and dietary intake of whole grains and fiber etc. provided evidences for factor that might delay or prevent Type-2 diabetes.^{2,9} Indians are highly susceptible to diabetes with modest over weight, obesity, and decrease in physical activity. The incidence and prevalence of diabetes in India increasing and is a result of dietary habits and life style. In adults the prevalence of diabetes is 2-3 folds greater in urban than in rural population.^{3,4} Prevalence of Type 2diabetes has increased dramatically with 1 million people reported to have been diagnosed with Type 2diabetes in 1994, increasing to 382 million by 2013, and with prediction of 592 million by 2035 Type-2diabetes is responsible for the deaths of approximately 1.5 million people annually and is a risk factor for cardiovascular disease (CVD), which kills 13 million people worldwide each year, accounting for 25% of all deaths, thereby increasing the economic burden within global healthcare systems.^{2,6} Insulin which is secreted from

beta cells of islets of langerhans from pancreas act through specific cell receptor of insulin sensitive cells which results in enhanced glucose uptake into the cell. Insulin being an anabolic hormone results in energy conservation and thereby signaling the body to produce fat. As BMI increases, insulin resistance also increases which results in increased blood glucose level. Since body weight is associated with BMI, it may be expected that BMI should correlate with blood glucose levels. As per result obtained positive and insignificant statistical correlation between the blood sugar level and Body Mass Index (BMI). In view of above the aim of this study was done to evaluate the correlate the yoga with age, BMI in type 2 diabetes subjects.

The study was carried out under the following objectives to assess the health status through BMI in diabetic patients aged between 30- 50 years (All subjects had Type-2 diabetes) and to correlate the effect of yoga on blood sugar level with age, BMI in diabetic subjects.

MATERIAL AND METHODS

The study was carried out in 50 diabetic male and female diabetic subjects from local hospitals from Agra city. Multistage stratified random sampling technique was used in the selection of samples. In this study relevant information regarding socio-economic profile, dietary pattern, Yoga etc. From the patient using the predesigned schedules was collected.

FBG measurement was done in morning after 12-hour fast and postprandial blood glucose using laboratory kits. A fasting blood sugar level above 126 mg/dl was confirmed as diabetic. Weight was recorded. Height was measured in standard standing position without shoes by using a tape meter, while keeping shoulders in erect position. Body mass index (BMI) was calculated by the formula weight (kg) divided by height squared (meter). Statistical analysis was performed to find out the effect of all factors on diabetes with the Cross tabulation was used to perform statistical calculation using SPSS. P value less than 0.05 was considered significant. The data were expressed as mean \pm SD

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RESULT

Out of the 50 male and female diabetic patients, majority of

them (50.00%) were having the body mass index of 20 – 25 kg., followed by 40.00% having the body mass index of 25

Body Mass Index(Kg/m ²)	Sex of the respondents				Total	
	Male		Female		No.	%
	No.	%	No.	%		
15-20(normal)	04	16.00	01	4.00	5	10.0
20-25(overweight)	14	56.00	11	44.00	25	50.0
25 and above(obese)	7	28.00	13	52.00	20	40.0
Total	25	50.00	25	50.00	50	100.0
Mean	22.84		23.51		23.18	
SD	3.77		5.21		4.56	
t-test					0.521	
p					>0.05	

Table-1: Distribution of the Male and female respondents according to body mass index

Yoga/day	Diabetic Patients				Total	
	Male		Female		No.	%
	No.	%	No.	%		
1 time	21	42.0	21	42.0	42	84.0
2 time	4	8.0	4	8.0	8	16.0
Total	25	50.00	25	50.00	50	100.0

Table-2: Distribution of the Male and female respondents according to Yoga day

Duration of yoga	Diabetic Patients				Total	
	Male		Female		No.	%
	No.	%	No.	%		
1 hour	7	14.0	10	20.0	17	34.0
1/2 Hour	13	26.0	4	8.0	17	34.0
<1/2 Hour	5	10.0	11	22.0	16	32.0
Total	25	50.00	25	50.00	50	100.0

Table-3: Distribution of the Male and female respondents according to duration of Yoga

Parameter	Statistical Values				
	Mean	SD	r	t	p
Body mass index	23.18	4.56			
Before Yoga	130.32	14.50	+0.140	0.980	>0.05
After Yoga	121.66	14.51	+0.085	0.591	>0.05
Changes	8.66	4.51	+0.170	1.195	>0.05

Table-4: Correlation between BMI with Fasting blood sugar level before Yoga, after yoga and changes.

Parameter	Statistical Values				
	Mean	SD	r	t	p
Body mass index	23.18	4.56			
Before Yoga	190.18	32.70	+0.079	0.549	>0.05
After Yoga	166.32	24.62	+0.026	0.180	>0.05
Changes	23.76	27.22	+0.089	0.619	>0.05

Table-5: Correlation between BMI with after 2 hours blood sugar level before Yoga, after yoga and changes.

Parameter	Statistical Values				
	Mean	SD	r	t	p
Age	49.96	11.66			
Before Yoga	130.32	14.50	+0.165	1.159	>0.05
After Yoga	121.66	14.51	+0.259	1.858	>0.05
Changes	8.66	4.51	+0.316	2.316	<0.05

Table-6: Correlation between age with Fasting blood sugar level before Yoga, after yoga and changes.

Parameter	Statistical Values				
	Mean	SD	r	t	p
Age	49.96	11.66			
Before Yoga	190.18	32.70	+0.135	0.944	>0.05
After Yoga	166.32	24.62	+0.143	1.001	>0.05
Changes	23.76	27.22	+0.029	0.029	>0.05

Table-7: Correlation between age with after 2 hours blood sugar level before Yoga, after yoga and changes.

and above and the minimum (10.00) were having the body mass index of 15-20. Out of the 50 male diabetic patients, majority of them (56.00%) were having the body mass index of 20 – 25 kg, followed by 28.0% having the body mass index of 25 and above and the minimum (16.00%) were having the body mass index of 15-20. Out of the 50 female diabetic patients, majority of them (52.00%) were having the body mass index of 25 and above followed by 44.0% having the body mass index of 20 – 25 kg, and the minimum (4.0%) were having the body mass index of 15-20. Further analysis of data from the table shows that the mean of BMI of the diabetic patients was 23.18 which were more among the female diabetic patients (23.51) as compared to male diabetic patients (22.84) (Table1). Out of the 50 male and female diabetic patients, majority of them (84.0%) were yoga 1 time in a day and the minimum (16.00) were doing yoga 2 times in a day. Among the male diabetic patients majority of them (84.0%) were yoga 1 time in a day and the minimum (16.00) were doing yoga 2 times in a day. Among the female diabetic patients majority of them (84.0%) were yoga 1 time in a day and the minimum (16.00) were doing yoga 2 times in a day. Table2 and Table 3 highlights the distribution of Male and female respondents according to duration of yoga. Out of the 50 male and female diabetic patients, majority of them (34.0%) were spend 1 hour per day and ½ hour per day in doing yoga, and the minimum (32.00) were spend <1/2 hour per day in doing yoga. Among the male diabetic patients majority of them (52.0%) were spend ½ hour per day in doing yoga, and the minimum (20.00) were spend <1/2 hour per day in doing yoga. Among the female diabetic patients majority of them (44.0%) were spend <½ hour per day in doing yoga, and the minimum (16.00) were spend 1/2 hour per day in doing yoga. Table-4 highlights the Correlation between BMI with Fasting blood sugar level before Yoga, after yoga and changes. Statistically, Positive and insignificant correlations were observed between BMI with fasting blood sugar level, before, after yoga and changes in the present study ($p>0.05$).

DISCUSSION

From the study it has been observed that statistically significant difference regarding mean of BMI was observed between male and female diabetic patients ($t=0.521, >0.05$).⁵ Table 2 highlights the distribution of Male and female respondents according to duration of yoga. Table 5 highlights the Correlation between BMI with after 2 hours blood sugar level before Yoga, after yoga and changes. Statistically, Positive and insignificant correlations were observed between BMI with pp blood sugar level, before, after yoga

and changes in the present study. ($p>0.05$). In studies we found that yoga can be used an effective therapy in reducing stress in type 2 Diabetes. Yoga in addition to standard care helps reduce BMI and improve glycemic control in type 2 diabetes patients.^{8,9,10,11} Table 6 highlights the Correlation between age with Fasting blood sugar level before Yoga, after yoga and changes. The mean of fasting blood sugar level before yoga in males were more than female diabetic patients Statistically, Positive and insignificant correlations were observed between age with fasting blood sugar level, before yoga, after yoga among the subjects ($p>0.05$). Negative and significant correlation was observed between age with changes in fasting blood sugar level among the respondents ($p<0.05$).¹² Table 7 highlights the Correlation between age with after 2 hours blood sugar level before Yoga, after yoga and changes. Statistically, Positive and insignificant correlations were observed between age with after 2 hours blood sugar level, before yoga, after yoga among the subjects ($p>0.05$). These findings are in accordance with other studies, which showed that yoga is assuming importance in improving mental health and quality of life with effective in reducing body weight, glucose level etc.

Results of our study are summarized below:

- A - To assess anthropometric measurement of the selected diabetic subjects
- B - To correlate the effect of yoga on blood sugar level with age, BMI in diabetic subjects.

CONCLUSION

From the study we found a positive and insignificant correlation between yoga and blood glucose level with age and BMI. It may be due to poor nutritional status, poor diet and lack of exercise etc. from the above observations, it can be concluded that regular exercise (Yoga) may prevent new-onset of Type 2-diabetes, especially in patients with high BMI and high glucose level. Thus, along with other forms of treatment mild regular physical exercise (Yoga) played an important role in primary prevention of other complications along with diabetes. Yoga in addition to standard care helps reduce BMI and improve glycemic control in type 2 diabetic patients

REFERENCES

1. Boule NG, Haddad E, Kenny GP. effects of exercise on glycemic control and body mass in type 2 diabetes mellitus: a meta analysis of controlled clinical trials, JAMA 2001;286:1218-27.
2. Ram, B.S., S.R. Shanti, V.R. Paturi, D. Sidharth, V. Madhu, K.D. Ashok, K.S. Binode M.F. Sahebrao,

- B. Raheena, S.S. Gurmukh and A.S. Navin, Diet and lifestyle guidelines and desirable levels of risk factors for the prevention of diabetes and its vascular complications in Indians: a scientific statement of The International College of Nutrition. *J.Cardiovascular Risk*. 1997;4:201-208.
3. Ramachandran, A., C. Snehalatha, D. Dharmaraj and M. Vishwanathan, Prevalence of glucose intolerance in Asian Indians: Urban-Rural Difference and significance of upper body adiposity. *Diabetes Care*. 1992;15: 1348-1355.
 4. Weinstein AR, Sesso HD, Lee IM, Cook NR, Manson JE, Buring JE, Gaziano JM. Relationship of physical activity vs body mass index with type 2 diabetes in women. *JAMA* 2004;292:1188-94.
 5. Sigal RJ, Kenny GP, Wasserman DH, Castaneda Sceppe C, white RD. Physical activity / exercise and type 2 diabetes., a consensus statement from the American diabetes association, *Diabetic care* 2006;29:1433-1438.
 6. Agardh E, Allebeck P, Hallqvist J. Type 2 diabetes Incidence and socioeconomic position: a systemic review and meta. analysis. *Int. J.Epidemiol* 2011; 4093;804-18.
 7. Emerging Risk factors collaboration: Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies 2010;375:2215–2222.
 8. Wilson C. Y. Yip, Ivana R. Sequeira, Lindsay D. Plank, and Sally D. Poppitt 2017: Prevalence of Pre-Diabetes across Ethnicities: A Review of Impaired Fasting Glucose (IFG) and Impaired Glucose Tolerance (IGT) for Classification of Dysglycaemia *Nutrients*. 2017; 9: 1273.
 9. Archana Singh. study to correlate the nutritional status among male and female diabetic patients. *Flora and Fauna* 2015;21:14-17.
 10. Neelam Agrawal, Mukesh Kumar Agrawal, Tannu Kumari, Sunil Kumar. Correlation between Body Mass Index and Blood Glucose Levels in Jharkhand Population *International Journal of Contemporary Medical Research* 2017;4:1633-1636.
 11. Bakari AG, Onyemelukwe GC, Sani BG, Aliyu IS, Hassan SS, Aliyu TM. Relationship between random blood sugar and body mass index in an African population. *Int J Diabetes Metab*. 2006;14:144–5.
 12. Subhash Manikappa Chimkode, Sendil D. Kumaran, V.V. Kanhere, and Ragunatha Shivanna Effect of Yoga on Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus *J Clin Diagn Res*. 2015; 9: CC01–CC03.

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