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Efficacy of Yoga Practices on Biochemical Variable Among Type 2 Diabetic Middle-Aged Women

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Abstract: This is an experimental research based on random group sampling between thirty-five to forty-five years of age. The middle-aged women suffering from type 2 diabetic are identified based on their feedback in the questionnaire designed for selection purposes. Selected 120 middle aged type 2 diabetic women were further screened, and 30 middle aged women were selected for the treatment depending upon the diabetic level. The selected middle-aged type 2 diabetic women were further divided into two groups -- experimental (Group A) and control (Group B) each containing 15 diabetic women. For twelve weeks, the Group A was given with yoga practices, one hour for six days from 6-7 a.m. weekly. The Group B was dynamic in rest. For both group A and group B, the pre-and post-test was taken on biochemical variable (fasting blood sugar) were determined. Examination of covariance (ANCOVA) was used to find out the substantial changes within two groups. The consequence of the review showed that fasting blood glucose level was reduced in Group A than the Group B due to practices of yoga.

Keywords: Diabetes, Fasting blood Sugar, Yoga Practices, Women

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Introduction

Diabetes Mellitus is a disorder with Genetical heritable inclinations and caused by less synthesis of insulin, or by less capacity to utilize insulin. Insulin is a hormone produced by the pancreas and is required by all cells to utilize glucose for their functions. The reason for diabetes mellitus is not known, yet heredity and diet are assumed to

play a major role in diabetes development (Doss *et al.*, 2015). Insulin is fundamental for glucose to enter from the blood to the cells. If sugar is not entered into the cells, the body can not produce energy. The unutilized sugar stays in the blood. Endocrine disorder is most common in Diabetes (Galicia-Garcia *et al.*, 2020).

Table1: Yogic Practices Schedule of Experimental Group

S. No.	Yogic Practices	Time Duration		
		I Four Weeks	II Four Weeks	Last Four Weeks
		40 Minutes	50 Minutes	60 Minutes
1	Sukshma Vvayama	5 Minutes	5 Minutes	3 Minutes
2	Sun Salutation	6 Minutes	10 Minutes	10 Minutes
3	Selective Asana	15 Minutes	18 Minutes	25 Minutes
4	Selective Pranayamas	4 Minutes	5 Minutes	7 Minutes
5	Om Meditation	10 Minutes	12 Minutes	15 Minutes

Patients with diabetes who participated in a yoga therapy programme had an increase in insulin receptors and a higher percentage of receptor binding. Yoga has been shown to have a number of health benefits, including the ability to lower blood sugar levels. As a direct consequence of this, insulin kinetics are improved, accompanied by a reduction in fasting sugar levels, a shift in the peak insulin level, and a normalisation of the insulin-to-glucose ratio (Sahay *et al.*, 2007; Gordon *et al.*, 2008).

Yoga is inside change considering the genuine structure through regenerative and energy of the bodies by its own cycle to lead a disorder free life. The purpose of this study was to discover the effectiveness of yoga practices on bio-chemical variables (fasting blood sugar) among type 2 diabetic middle-aged women. The type 2 diabetic middle-aged women are more likely to be overweight, obsess and also be exaggerated with depression, anxiety and stress.

Materials and Methods

For selection of subjects, Questionnaire circulated among randomly selected 120 middle aged type 2 diabetic women. Then volunteers were further screened and 30 middle aged women were selected for the treatment depending upon the diabetic level. The selected middle-aged type 2 diabetic women were further divided into two groups-- experimental (Group A) and control (Group B) each containing 15 women. For Twelve weeks, Group A was given with yoga practices, one hour for six days from 6-7 a.m. weekly. The Group

B was dynamic in rest. Training schedule for Yoga practices are given in Tables 1 and 2. Figure 1 shows the flow chart of the entire procedure.

Ethical clearance certificate has been given by Medical team of Meenakshi Medical College Hospital.

Results and Discussion

The Fasting blood Glucose (FBG) were determined from both groups (A and B). The yoga treatment time frame were genuinely examined using ANCOVA (Analysis of Covariance) to decide the massive distinction and tried at a 0.05 degree of implication. The result is presented in Table 3 and Figure 2.

The F value of pre-scores on the Group A were 4.03 only. After the yoga practices of twelve weeks, the post-score F-ratio of FBG was found to be 54.09 which is higher than the table value 4.2. It is evident that yoga practices helped type 2 diabetic middle-aged women to reduce their blood glucose levels considerably. The present study is in conformity with studies conducted by Shantakumari *et al.* (2012). Shantakumari *et al.* (2012) stated that after 3 months of yoga practices, there was a considerable decrease in FBS from 155.86 ± 60.53 to 126.63 ± 40.59 mg%. These studies inferred that yoga might help in wellbeing of diabetic women. The practices of yoga like Kriyas, Asanas, relaxation techniques, pranayama and meditation can reduce fasting blood glucose level. Adjusted mean of 39.02 is higher than the table value of 4.21. Hypothesis 0.05 confidence level was accepted.

Table 2: Yogic practices for twelve weeks (six days a week from 6 am to 7 am)

S. No.	Yogic Practices	Breadth	Repetition/ Round	Duration of each practice (in seconds)	Rest time (in seconds)	Total duration (in seconds)
1	SukshmaVvayama	Normal	3	50	10	180
2	Sun Salutation	Deep	5	90	30	600
3	Tadasana	Exhale	3	15	5	60
		Normal 12Breadth				
		Inhale				
4	Urdhvaastasana	Exhale	3	30	10	120
		Normal 12Breadth				
		Exhale				
		Normal 12Breadth				
		Exhale				
5	AdhomukthaSwasana	Exhale	3	20	20	120
		Normal 12Breadth				
		Inhale				
6	Dhanurasana	Inhale	2	20	10	60
		Normal 12Breadth				
		Exhale				
7	Setubandhasana	Exhale	2	20	10	60
		Normal 12Breadth				
		Inhale				
8	Bhujangasana	Exhale	2	20	10	60
		Normal 12Breadth				
		Inhale				
9	Pachimottanasana	Exhale	2	20	10	60
		Normal 16Breadth				
		Inhale				
10	Ardhamatsyendrasana	Exhale	2	20	10	60
		Normal 12Breadth				
		Inhale				
		Exhale				
		Normal 8Breadth				
		Inhale				
11	Halasana	Exhale	2	20	10	60
		Normal 12Breadth				
		Inhale				
12	ViparitaKarani	Deep Breadth	3	30	20	150
		Exhale				
		Exhale				
		Normal 12Breadth				
		Exhale				

13	Pawanmuktasana	Exhale	3	20	10	90
		Deep 16breath				
		Inhale				
14	Bhastrika Pranayama	25Breadth	3	30	30	180
15	Ujjay Breadth	16Breadth	5	20	10	150
16	Kapalapathi	20Breadth	3	20	10	90
17	NadiShodhana	20Breadth	3	30	30	180
18	Om Meditation	Normal	1	900		900
19	Conscious Breathing	SlowBreadth	1	600		600

Table 3: ANCOVA of the means of experimental group and the control group on fasting blood sugar (mg/dl)

Test	Experimental group	Control group	Source of variance	Sum of Squares	Degree of freedom	Mean Sum of Squares	F-Ratio
Pre-test	132.66	137.86	between	137.86	1	137.86	4.03
			within	957.07	28	34.18	
Post-test	109.00	132.73	between	4224.53	1	4224.53	54.09*
			within	2186.93	28	78.10	
Adjusted	110.75	130.98	between	2533.16	1	2533.16	39.02*
			within	1752.96	27	64.92	

Table F-ratio at 0.05 level of confidence for 1 and 28 (degree of freedom) = 4.2, 1 and 27 (degree of freedom) =4.21) *Significant at 0.05 level of confidence

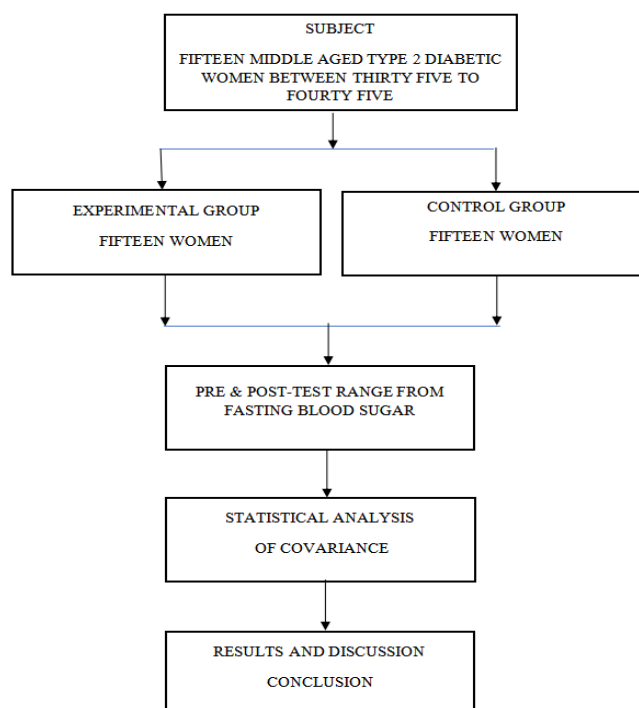
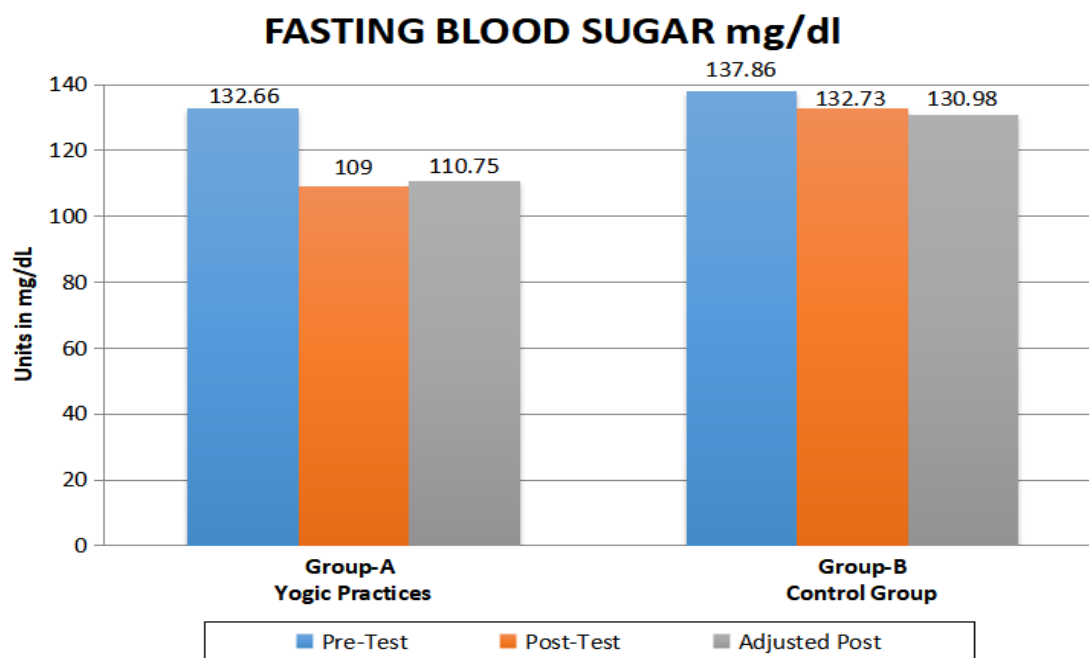


Fig. 1: Flow chart showing methodology adopted for study.



(Table F-ratio at 0.05 level of confidence for 1 and 28 (degree of freedom) =4.2, 1 and 27 (degree of freedom =4.21) Significant at 0.05 level of confidence.

Yoga offers a cost-reduce and safe involvement for Type 2 Diabetes. Innes *et al.* (2007) has conducted the research in yoga programs on risk factors among adults with type 2 diabetes mellitus. They recognized 25 studies, with 4 (RCTs) randomized controlled sample, 6 non-randomized controlled sample and 15 non-controlled trials. These studies recommend useful changes in several threat within glucose resilience and insulin responsiveness, lipid, sympathetic and pulmonary activation, pulse, oxidative pressure and coagulation.

Conclusion

It is clear from the present data that yoga practises bring about a reduction in the amount of glucose in the blood while the individual is fasting. Insulin from the pancreas has a significant impact on blood sugar levels. When insulin levels drop, the glucose level in our bodies rises to an unhealthy level. Middle-aged women with type 2 diabetes may benefit from yoga practises by achieving a

better insulin and glucose balance in their bodies.

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