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Effect of yoga with Varma therapy and traditional medicine on blood sugar variables among middle-aged diabetes mellitus men

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Abstract

The most prevalent chronic illness, diabetes mellitus, is a lifelong disorder that impairs the body capacity to use the energy that comes from meals. The present investigation to find out the effect of yoga with varma therapy and traditional medicine on blood sugar variables among middle-aged men. To achieve this purpose, forty men pre-diabetic persons were randomly selected from Sivakasi, Tamilnadu, India. The selected subjects age, ht and wt range were 42 ± 5 years, 165 ± 8 cm and 74 ± 8 kg correspondingly. The average blood glucose level of selected people observed 120 ± 4 as therefore the selected persons were identified as pre-diabetic persons. Group I was the yoga with varma group, Group II was the yoga with traditional medicine group, and Group III was the yoga with varma and traditional medicine group. They were divided into four equal groups at random, each with ten subjects ($n=10$). The group IV would be considered as control group, which did not undergo any specific physical activity or therapy except their regular activities and diet. The consent obtained from the participants, nevertheless, they were free to leave their consent, in case they feel any uneasiness during the tenure of their participation, but there were no withdraw in this study. All the subjects of the four groups were tested by selected dependent variables for the present study such as fasting blood sugar test, post parental blood sugar test, glycosylated hemoglobin (HbA1C or A1C) prior to and immediately after the training programme. Before and right after the training program, all four groups' individuals were assessed on criteria variables for significance using an independent "t" test to determine the starting and final mean differences on each variable. The difference between the group's initial and final means was determined using the analysis of covariance. Additionally, the paired mean differences will be determined using Scheffe's post-hoc test. To determine the improvement from the baseline score on specific variables, the magnitude of improvement was also computed. The level of confidence is fixed at 0.05, for significance. The result of present study observed that the yoga, varma and traditional medical application had significant contribution for reducing of blood sugar level. The present study concluded that the yoga with varma and traditional medicine group has highly positive impact in the management of blood sugar among middle-aged men.

Keywords: Yoga, varma, traditional medicine, fasting sugar, postprandial sugar, HbA1c

Introduction

Diabetes necessitates a multifaceted therapeutic approach because it is a complex disease that causes several complications. Diabetes patients' cells either do not respond to insulin or do not produce enough of it (Grover, 2002) [6]. Patients receive insulin injections if they are completely insulin deficient. However, numerous medications are created for those whose cells do not react to insulin. Considering potential disruptions in the metabolism of carbohydrates (Scartezzinim 2000) [12]. Diabetes is not only quite common in India, but it is also fast rising among the urban population, according to studies done in the past ten years. It is estimated that there are approximately 33 million adults with diabetes in India. This number is likely to increase to 67.2 million by the year 2027 (Seth, 2004) [14].

Slow, static muscle activity is known as yogic exercise. It can be carried out even by patients who would not normally engage in traditional physical activities like intense strength training and gym-based training due to reduced joint mobility and physical unfitness brought on by an

overweight and sedentary lifestyle. It appears to be the oldest and most successful technique for bringing about serenity and preserving mental tranquility. Volunteers who practice yoga are known to experience physiological and specific biochemical changes [Rugmini, 1999]. The greatest choices in underdeveloped nations include low-cost methods for identifying people who are at risk and the use of low-cost lifestyle therapies like yoga [Jyotsna, 2014] ^[14].

The term *varmam* as *Vazhi Aatral*. Varmam is one among the ancient old commonly used external therapies. It is one among the South Indian Marital Arts. In modern Varma therapy is called as *Thanuology*. Varma points are so called life centres where saram (a vital energy) raverses through it. By giving pressure as mentioned in literature *Vata*, *Pitha*, *Kapha* normalises the deranged humour. The varma is a channelized pathway of transporting the energy to various parts of our body to maintain the homeostasis. In case of orthopaedic disorder Varma therapy plays a major role in it. It is also involved in treating conditions like diabetics, cervical spondylosis, lumbar spondylosis, ligament injuries), osteo arthritis, hemiplegia etc. Varmam is a comprehensive, low cost and effective therapy in treating orthopaedic cases.

The field of herbal medicine has experienced exponential expansion in recent years, and due to their natural origin and fewer side effects, these medications are becoming more and more popular in both developed and developing nations. Medicinal plants, minerals, and organic materials are the source of many currently used traditional medicines. There have been reports of more than 400 traditional plant remedies for diabetes to date, but very few of these have been evaluated scientifically and medically to determine their effectiveness. In both human and animal models of type 2 diabetes, the hypoglycemic impact of some plant extracts has been verified. Additional research on traditional medicinal herbs has been suggested by the World Health Organization Expert Committee on Diabetes. [Nagarajan Kartik, 2018] ^[18].

The critical components of diabetes management are medication, diet and physical activity and exercise (Falci, 2016) ^[5]. However, many complementary and alternative practices have been used by people in both the prevention and treatment of diabetes such as yoga, varma and traditional medical application (Medagama, 2014) ^[14].

However, there are few reports as regards to the influence of yoga on blood sugar level. Hence, the present study was undertaken to assess the beneficial effects of yoga, varma therapy and traditional medicine on blood sugar levels in middle-aged normal and diabetes mellitus men.

Methodology

To achieve this purpose, forty men pre-diabetic parsons were randomly selected from Sivakasi, Tamilnadu, India as subjects. The selected subjects age, height and weight range were 42±5 years, 165±8 cm and 74±8 kg respectively. The average blood glucose level of selected subjects observed 120±4 as therefore the selected subjects were identified as pre-diabetic persons. They were randomly split into four equal groups, and all groups contains of ten (n=10) subjects in

each, in which they known as group I yoga with varma group, group II yoga with traditional medicine group and group III yoga with varma and traditional medicine group. The group IV would be considered as control group, which did not undergo any specific physical activity or therapy except their regular activities and diet. The consent obtained from the participants, nevertheless, they were free to leave their consent, in case they feel any uneasiness during the tenure of their participation, but there were no withdraw in this study. All the subjects of the four groups were tested by selected dependent variables for the present study such as fasting blood sugar test, postprandial blood sugar test, glycosylated hemoglobin (HbA₁C or A₁C) prior to and immediately after the training programme. The whole experimental program was implemented for six days per week for twelve weeks. In every day training session, the practice lasted approximately between forty-five minutes and an hour, which included warning up and relaxation. under yogasana, a batch of twelve asana, which are commonly called of Suryanamaskar was given to the subjects, followed by Ardhakaticakrasaa, Eka Pada Asana, Vajrasana, Janu Sirsasana, Parivritta Janusirsasana, Baddha Konasana, Ek Pada Kapotasana, Balasana, Makarasaa Majariasana, Pawanmuktasana, Sethubandhasana, Viparitakarni, Markatasana, Savasana, Chandra Bhendana, Nadi Shuddhi, Anuloma Viloma, Bhramari Pranayama, Ujjayi, Silent Meditation. The pranayama practices with 2 to 5 sets of 5 to 15 repetitions increased every 3 weeks respectively. Shanmuki Mudra, Aswini Mudra, Brahma Mudra, Bhujangini Mudra, ViparitaKaranifollowed as mudra practice. The varma therapy such as Urumi Kaalam (At the end of the Sternum bone in between the rib cage), Nangana Poottu (Sacroiliac joints), Aamai Kaalam (Mid of the thigh - Quadriceps Femoris), Vaayu Kaalam (T 12 Point of the Spinal Cord). The traditional medicine such as Sirukurinchaan Chooranam (*Gymnema sylvestre*), Morning before breakfast, Tirikadugu Chooranam (Sukku, Millagu, Tippili) every day after Lunch. TriphalaChooranam (Nellikai, Kadukkai, Thandrikkai), every day after dinner. The traditional medicines are mixed with hot water before consume. Before and right after the training program, all four groups' individuals were assessed on criteria variables for significance using an independent "t" test to determine the starting and final mean differences on each variable. The difference between the group's initial and end means was determined using the analysis of variance (ANOVA). Following the removal of the pre-test influence, ANCOVA was used to determine if the adjusted post-test means of the experimental groups were significant. Additionally, when the F-ratio of the adjusted post-test means is significant, Scheffe's post-hoc test will be used to determine whether there is a paired mean difference between the groups for each variable independently. Further the magnitude of improvement between pre and post data of experimental groups and control group assess by using percentage calculation on selected criterion variables. The level of confidence fixed at 0.05, for significance. The data on selected criterion variables were analyses using IBM SPSS software version 21.0.

Results

Table 1: Independent ‘T’ Test Among Experimental and Control Group on Selected Blood Sugar Variables

	YVC	YTMC	YVTMC	CG
Fasting Blood Sugar	T - 19.12* (126.50 – 116.20)	T - 29.316* (126.60 – 112.00)	T - 37.85* (126.60 - 108.40)	T - 1.65 (127.00 – 126.30)
Postprandial Blood sugar	T - 3.62* (190.90-151.30)	T - 39.82* (190.10 – 148.30)	T - 41.57* (189.80 – 141.77)	T - 1.66 (189.20 – 184.30)
HbA1c	T - 6.71* (6.22 – 6.02)	T - 2.54* (6.21 – 6.10)	T - 6.74* (6.21 – 5.95)	T - 0.41 (6.18 – 6.17)

The table value for df-18 is 1.734. * Significant at 0.05 level.

YVC - Yoga with Varma Group, YTMC - Yoga with Traditional Medicine Group, YVTMC - Yoga with Varma and Traditional Medicine, CG - Control Group.

The pre and post data of YVC, YTMC, YVTMC and CG on fasting sugar level were 126.50 – 116.20, 126.60 – 112.00, 126.60 - 108.40, 127.00 – 126.30. The pre and post data of YVC, YTMC, YVTMC and CG on postprandial sugar level were 190.90-151.30, 190.10 – 148.30, 189.80 – 141.77, 189.20 – 184.30. The pre and post data of YVC, YTMC, YVTMC and CG on HbA1c sugar level were 6.22 – 6.02, 6.21 – 6.10, 6.21 – 5.95, 6.18 – 6.17. the obtained ‘t’ value

significant of YVC, YTMC, YVTMC on selected blood sugar variables were as the CG no significant on selected blood sugar variables. The results on above table indicate that the experimental group’s shows significant reduction on blood sugar level due to respective yoga, varma and traditional medical practice protocol, whereas, control group had no significant among pre-diabetic middle aged men.

Table 2: Analysis of Covariance among Experimental and Control Group on Blood Sugar Variables

Adjusted Post Test Mean	Yoga with Varma	Yoga with TM	Yoga with Varma and TM	Control Group	SOV	SS	df	MS	F
Fasting Blood Sugar	116.23	112.01	108.41	126.25	B	1196.47	3	398.82	117.21*
					W	119.09	35	3.04	
Postprandial Blood sugar	150.98	148.56	141.77	184.58	B	10747.85	3	3582.62	161.06*
					W	778.55	35	22.24	
HbA1c	6.01	6.09	5.94	6.18	B	0.307	3	0.102	22.67*
					W	0.158	35	0.005	

*Significant, (The table values of df 3 and 35 was 2.866, 2.874 respectively)

The result of above table shows that, there was a significant difference among yoga with varma group, yoga with traditional medicine group, yoga with varma and traditional medicine group and control group on fasting blood sugar level, post prandial blood sugar level and HbA1c variables

among pre diabetic middle-aged men. Since, the obtained ‘F’ value found significant, the scheffe’s post hoc test was applied to find out the paired mean difference presented in table 3.

Table 3: Scheffe Post HOC Test on Paired Mean among Experimental and Control Group on Blood Sugar Variables

Variables	Test	Yoga Varma Vs Yoga TM	Yoga Varma Vs Yoga Varma & TM	Yoga Varma Vs Control Group	Yoga TM Vs Yoga Varma & TM	Yoga TM Vs Control Group	Yoga Varma & TM Vs Control Group
Fasting Sugar Level	Mean Difference	4.02*	7.80*	10.07*	3.60*	14.27*	17.87*
	P Value	0.000	0.000	0.000	0.000	0.000	0.000
Post Prandial Sugar Level	Mean Difference	2.712	9.209*	33.604*	6.493*	36.320*	42.813*
	P Value	0.210	0.000	0.000	0.004	0.000	0.000
HbA1c	Mean Difference	0.089*	0.061*	0.172*	0.150*	0.083*	0.233*
	P Value	0.006	0.049	0.000	0.000	0.009	0.000

*Significance at 0.05

The result on paired mean difference shows that the experimental groups show better reduction on selected blood sugar level when compared with control group. The results of study show that the yoga with varma group, yoga with traditional medicine group, yoga with varma and traditional medicine group had better reduction on blood sugar level among pre diabetic middle-aged men. The table also shows

that there was no significant difference on postprandial blood sugar level between yoga with varma group and yoga with traditional medicine group. However, the improvement was in favor of yoga with varma and traditional medicine group when compare with rest of the experimental groups.

Magnitude of Improvement

Magnitude of Improvement	Yoga with Varma	Yoga with TM	Yoga with Varma and TM	Control Group
Fasting Blood Sugar	8.86%	13.04%	16.79%	0.55%
Postprandial Blood sugar	26.17%	28.19%	33.88%	2.66%
HbA1c	3.32%	1.80%	4.37%	0.16%

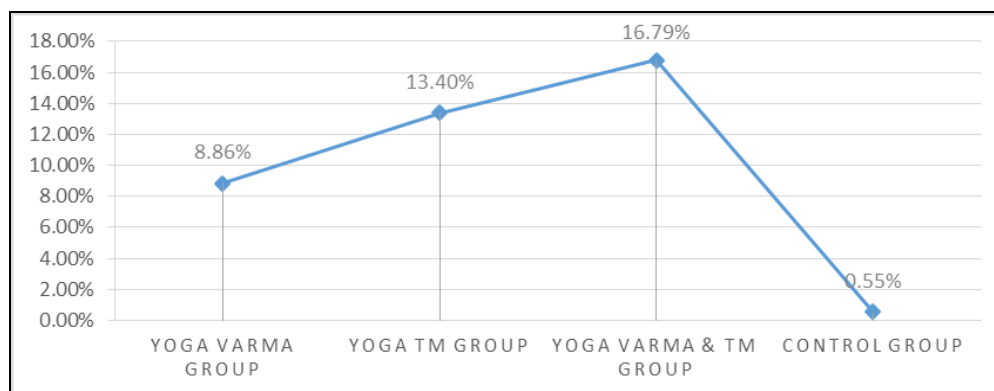


Fig 1: Graphical Representation of Magnitude of Improvement of Fasting Blood Sugar Level

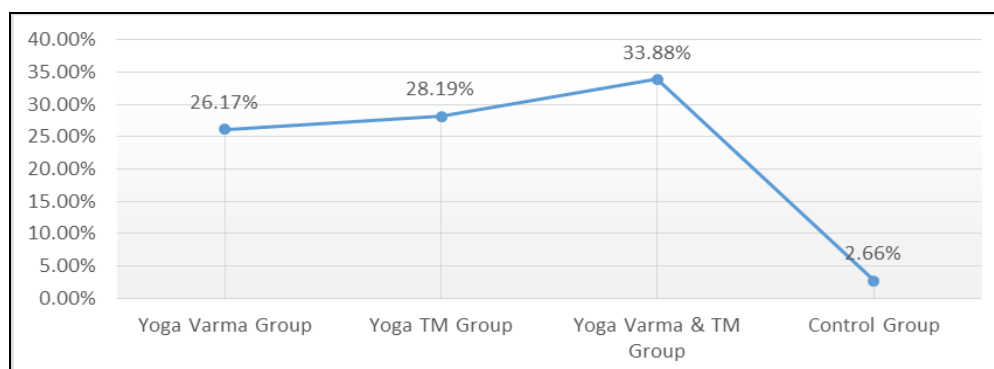


Fig 2: Graphical Representation of Magnitude of Improvement of Post Prandial Blood Sugar

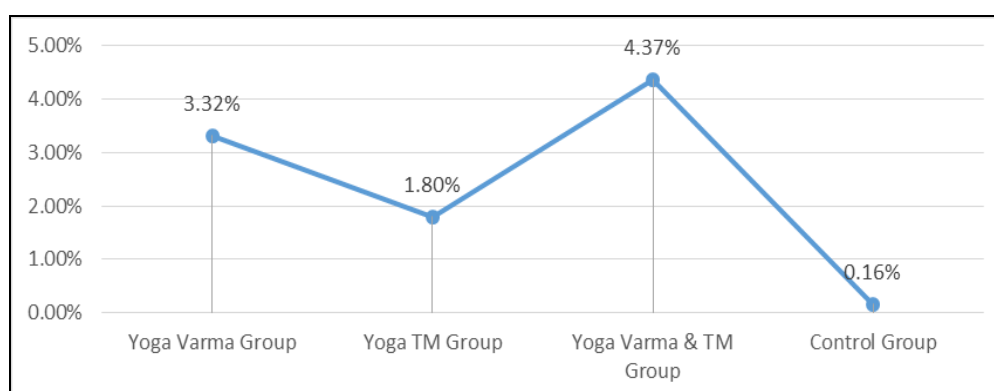


Fig 3: Graphical Representation of Magnitude of Improvement of HbA1c

Discussion

The result on present study reveals that the yoga varma and traditional medicine on diabetes men. As a result, the findings were compared to those of earlier studies in order to determine a logical association.

Selvalakshmi (2019) ^[13], experimented simplified Kundalini yoga with and without varma therapy on blood sugar fasting and blood sugar post prandial among diabetes men of 30 subjects. The simplified kundalini yoga with Varma Therapy was found better in reducing the Blood Sugar (Fasting) and Blood Sugar (Post Prandial) than the Kundalini yoga without Varma Therapy group. The above result in-line with the present study.

An observational study with 10 subjects conducted in South Indian population integrating Siddha medicine with yoga practices and dietary modifications along with allopathic medicines showed beneficial results in FBS, PPBS and HbA1c on type 2 diabetes that recommends for clinical trials and long-term studies (Mirunaleni *et al.*, 2018) ^[10]. Even there are studies integrating Ayurveda and yoga which exhibits potential benefits in integrative management of diabetes along

with lifestyle modifications (Sharma *et al.*, 2019) ^[15] also patients with type 2 diabetes mellitus who underwent yoga and naturopathic treatments had adequate glycemic control. Which also suggest long-term studies (Bairya *et al.*, 2016) ^[3].

The significant decrease in fasting blood sugar and post parental blood sugar levels after yoga in both groups in the present study indicates potential role of yoga in preventive and management strategies for diabetes mellitus. A significant decrease in fasting blood sugar and post parental blood sugar levels has been reported diabetes mellitus patients on oral hypoglycemic agents undergoing yoga training when compared to those only on oral hypoglycemic agents.

Similarly, a significant decrease in fasting blood sugar and post parental blood sugar after yoga training has been demonstrated in diabetes mellitus patients on OHA. The beneficial effect of yoga in diabetes mellitus has been attributed to increased insulin sensitivity at target tissues which decreases insulin resistance and consequently increases peripheral utilization of glucose. It has also been postulated that yoga can rejuvenate or regenerate beta cells of pancreas.

Because of its anti-inflammatory, anti-oxidant, blood lipid-

regulating, and anti-glucose qualities, herbal medicine is mostly used to treat diabetes mellitus. Herbal medicine is a suitable complementary and alternative treatment for diabetes mellitus because of its superior holistic quality, which can cure the condition through numerous targets (Anne McIntyre, 2010). Herbal medicine does have certain shortcomings, though, which require more research. There are many different chemicals in herbs, particularly in some herbal formulae, and it can be challenging to distinguish between the harmful and active ingredients. Animals are used in the majority of the aforementioned studies. There is currently a dearth of accurate and comprehensive data from large-scale, multicenter clinical investigations. Furthermore, there have also been few reports on follow-up observations of patients with diabetes mellitus treated with herbal medicine (Chang, 2013) [4]. Thus, it was observed that yoga traditional medicine and varma therapy practice had significant contribution for reducing blood sugar level. Moreover, the subjective feelings of participant were also support the result.

Conclusion

It is possible to draw the conclusion that the group that combined yoga, varma, and traditional medicine had the greatest effect on a particular blood sugar level based on the findings and discussion of the current study on these three practices for controlling blood sugar levels in middle-aged males. The groups that engaged in yoga with traditional medicine and yoga with varma therapy showed comparable increases in postprandial blood sugar levels. Based on baseline results, both groups also shown improvements in blood sugar indicators. This finding also encourages there is a scope to carry out the various research studies in this regard.

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